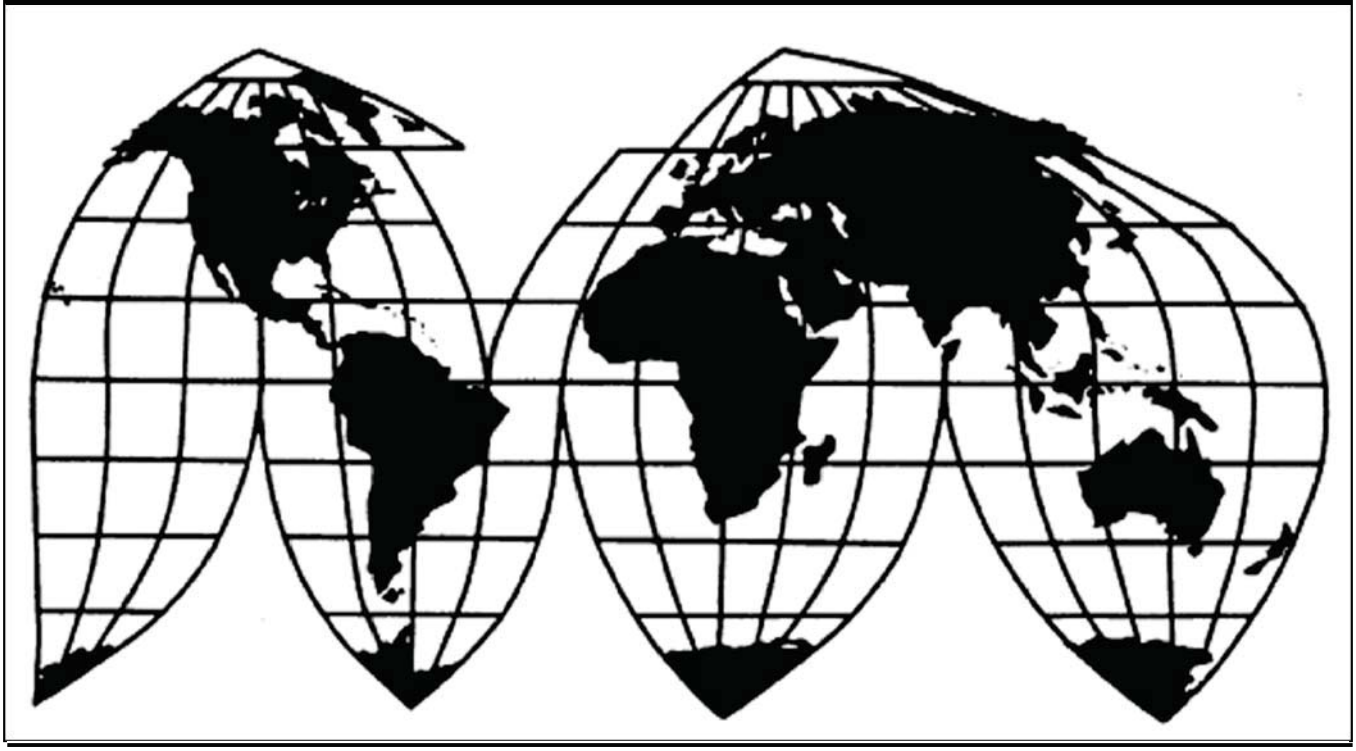
In the Matter of

Certain Semiconductor Chips with Minimized Chip Package Size and Products Containing Same

Investigation No. 337-TA-605
Volume 1 of 2

Publication 4282 **November 2011**

U.S. International Trade Commission



Washington, DC 20436

U.S. International Trade Commission

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In the Matter of

Certain Semiconductor Chips with Minimized Chip Package Size and Products Containing Same

Investigation No. 337-TA-605
Volume 1 of 2

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November 2011

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME**	**Investigation No. 337-TA-605**

ORDER: GRANT OF JOINT PETITION TO RESCIND CEASE AND DESIST ORDER DIRECTED TO MOTOROLA, INC.

The Commission instituted this investigation on May 21, 2007, based on a complaint filed by Tessera, Inc. of San Jose, California ("Tessera") against Spansion, Inc. and Spansion, LLC, both of Sunnyvale, California (collectively "Spansion"); QUALCOMM, Inc. of San Diego, California ("Qualcomm"); ATI Technologies of Thornhill, Ontario, Canada ("ATI"); STMicroelectronics N.V. of Geneva, Switzerland ("ST-NV"); Freescale Semiconductor, Inc. of Austin, Texas ("Freescale") (collectively "Respondents"); and Motorola, Inc. of Schaumburg, Illinois ("Motorola"). 72 *Fed. Reg.* 28522 (May 21, 2007). The complaint alleges violations of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, and the sale within the United States after importation of certain semiconductor chips with minimized chip package size or products containing same by reason of infringement of one or more claims of U.S. Patent Nos. 5,852,326 ("the '326 patent") and 6,433,419 ("the '419 patent").

On May 20, 2009, the Commission terminated this investigation with a finding of

violation of Section 337 as to both asserted patents. The Commission determined that the appropriate form of relief is (1) a limited exclusion order under 19 U.S.C. § 1337(d)(1) prohibiting the unlicensed entry of semiconductor chips with minimized chip package size and products incorporating these chips that infringe one or more claims of the '326 patent and the '419 patent, and are manufactured abroad by or on behalf of, or imported by or on behalf of, Spansion, Qualcomm, ATI, Motorola, ST-NV, and Freescale; and (2) cease and desist orders directed to Motorola, Qualcomm, Freescale, and Spansion. The Commission also issued the confidential version of its opinion on May 20, 2009.

On July 31, 2009, Tessera and Motorola filed a joint petition pursuant to 19 U.S.C. § 1337(k) and 19 C.F.R. § 210.76 to rescind in whole the cease and desist order directed to Motorola based upon a license agreement entered into between the two parties. On August 12, 2009, the Commission investigative attorney filed a response supporting the joint petition.

Upon consideration of this matter, the Commission hereby ORDERS that:

> Tessera's and Motorola's joint petition to rescind the cease and desist order directed to Motorola is GRANTED.

By order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: August 18, 2009

CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME **337-TA-605**

PUBLIC CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **ORDER: GRANT OF JOINT PETITION TO RESCIND CEASE AND DESIST ORDER DIRECTED TO MOTOROLA, INC.** has been served by hand upon the Commission Investigative Attorney, Jeffrey T. Hsu, Esq., and the following parties as indicated, on August 19, 2009 .

Marilyn R. Abbott, Secretary
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UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of **CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME**	**Investigation No. 337-TA-605**

NOTICE OF COMMISSION FINAL DETERMINATION OF VIOLATION OF SECTION 337; TERMINATION OF INVESTIGATION; ISSUANCE OF LIMITED EXCLUSION ORDER AND CEASE AND DESIST ORDERS

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined that there is a violation of 19 U.S.C. § 1337 by Spansion, Inc. and Spansion, LLC, both of Sunnyvale, California (collectively "Spansion"); QUALCOMM, Inc. of San Diego, California ("Qualcomm"); ATI Technologies of Thornhill, Ontario, Canada ("ATI"); Motorola, Inc. of Schaumburg, Illinois ("Motorola"); STMicroelectronics N.V. of Geneva, Switzerland ("ST-NV"); and Freescale Semiconductor, Inc. of Austin, Texas ("Freescale") (collectively, "Respondents") in the above-captioned investigation. The investigation is terminated.

FOR FURTHER INFORMATION CONTACT: Megan M. Valentine, Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 708-2301. Copies of non-confidential documents filed in connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-2000. General information concerning the Commission may also be obtained by accessing its Internet server at *http://www.usitc.gov*. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://edis.usitc.gov*. Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810.

SUPPLEMENTARY INFORMATION:

The Commission instituted this investigation on May 21, 2007, based on a complaint filed by Tessera against Spansion, Qualcomm, ATI, Motorola, ST-NV, and Freescale. 72 *Fed. Reg.* 28522 (May 21, 2007). The complaint alleges violations of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, and the sale within the United States after importation of certain semiconductor

chips with minimized chip package size or products containing same by reason of infringement of one or more claims of U.S. Patent Nos. 5,852,326, and 6,433,419.

On December 1, 2008, the presiding administrative law judge ("ALJ") issued his final ID finding no violation of Section 337 by Respondents. The ID included the ALJ's recommended determination ("RD") on remedy and bonding. In his ID, the ALJ found that Respondents' accused products do not infringe the asserted claims the '326 patent or the asserted claims of the '419 patent. The ALJ additionally found that the asserted claims of the '326 and '419 patents are not invalid for failing to satisfy the enablement requirement or the written description requirement of 35 U.S.C. § 112 ¶ 1. The ALJ further found that the asserted claims of the '326 and '419 patents are not invalid as indefinite of 35 U.S.C. § 112 ¶ 2. The ALJ also found that the asserted claims of the '326 and '419 patents are not invalid under 35 U.S.C. § 102 for anticipation or under 35 U.S.C. § 103 for obviousness. Finally, the ALJ found that an industry in the United States exists with respect to the '326 and '419 patents as required by 19 U.S.C. § 1337(a)(2) and (3). In his RD, the ALJ recommended that, should the Commission determine that a violation exists, a limited exclusion order ("LEO") would be properly directed to Respondents' accused chip packages and to the downstream products of Motorola, a named respondent.

On December 15, 2008, Tessera and the Commission investigative attorney ("IA") filed separate petitions seeking review of the ALJ's determination concerning non-infringement of the asserted claims of the '326 and '419 patents. Also on December 15, 2008, Respondents filed various contingent petitions seeking review of certain aspects of the ALJ's findings as concern both the '326 and '419 patents in the event that the Commission determined to review the ID's findings concerning non-infringement. On December 23, 2008, Respondents filed an opposition to Tessera's and the IA's petitions for review, and Tessera and the IA filed separate responses to Respondents' various contingent petitions for review.

On January 30, 2009, the Commission determined to review the final ID in part and requested briefing on the issues it determined to review, remedy, the public interest, and bonding. 74 *Fed. Reg.* 6175-6 (Feb. 5, 2009). The Commission determined to review: 1) the ALJ's finding that Respondents' accused devices do not infringe the asserted claims the '326 and '419 patents; 2) the ALJ's finding that Tessera has waived any argument that the accused products indirectly infringe the '419 patent; 3) the ALJ's finding that Motorola's invention of the 1989 68HC11 OMPAC chip ("OMPAC") does not anticipate the asserted patents under 35 U.S.C. § 102(b); and 4) the ALJ's finding that the Motorola's OMPAC invention does not anticipate the asserted patents under 35 U.S.C. § 102(g). *Id.* The Commission determined not to review the remaining issues decided in the ID. On February 6, 2009, Respondents filed a motion to extend the briefing schedule. On February 10, 2009, the Commission issued a Notice extending the deadline for receiving initial submissions and reply submissions in light of the fact that the ALJ did not issue the public version of the final ID until February 9, 2009. The Commission also extended the target date to April 14, 2009. The Commission issued a corrected version of the Notice on February 18, 2009, clarifying the deadline for reply submissions of issues relating to violation of Section 337.

On February 23, 2009, the parties filed initial written submissions regarding the issues on review, remedy, the public interest, and bonding. On March 5, 2009, the parties filed response submissions. Several respondents ("the 649 Respondents) in co-pending investigation *Certain Semiconductor Chips with Minimized Chip Package Size and Products Containing Same*, Inv. No. 337-TA-649 ("the 649 Investigation"), also filed reply briefs on remedy, the public interest, and bonding. In its initial submission on remedy, Tessera requested that the Commission issue a "tailored" general exclusion order ("GEO") should the Commission determine that there is a violation of Section 337. Tessera also requested that, should the Commission determine that the current record is not adequate to support issuance of a GEO, the Commission should issue the LEO recommended by the ALJ immediately, and then conduct further proceedings regarding the availability of a tailored GEO. The IA concurred. Respondents in this investigation and the 649 Respondents opposed Tessera's request for a "tailored" GEO. On March 9, 2009, Siliconware Precision Industries Co., Ltd. and Siliconware U.S.A., Inc. (collectively "SPIL Respondents"), who are respondents in the 649 Investigation, filed a motion to extend the date for filing reply submissions to the Commission's Notice of Review of the final ID and to compel the production of Tessera's initial confidential briefing in response to the Commission's Notice.

In support its February 23, 2009, brief on Remedy, the Public Interest and Bonding, Tessera submitted an affidavit from Dr. Stephen Prowse and a statement from Mr. Bernard Cassidy. On March 5, 2009, Respondents filed a motion to strike Dr. Prowse's affidavit and Mr. Cassidy's statement. On March 16, 2009, the IA filed a response in support of Respondents' Motion to Strike.

On March 11, 2009, Spansion filed a Notice of Commencement of Bankruptcy Proceedings and of Automatic Stay, requesting a stay of the investigation because it and certain of its subsidiaries had filed for relief under Chapter 11 of the United States Bankruptcy Code, 11 U.S.C. § 101 *et seq*. Tessera filed an opposition to Spansion's request on March 18, 2009, and the IA filed an opposition on March 23, 2009.

On March 26, 2009, the Commission issued a Notice requesting additional briefing on remedy and extending the target date. 74 *Fed. Reg.* 14820-1 (April 1, 2009). In the Notice, the Commission asked the parties and any interested non-parties to address whether Tessera is entitled to a GEO under 19 U.S.C. § 1337(d)(2), whether the Commission has the authority to issue a "tailored" GEO, which would ostensibly reach only specified downstream products, and whether the Commission has the authority to issue an LEO immediately and then issue a GEO at a later date when the Commission concludes the investigation. On April 10, 2009, Tessera, the IA, Respondents, and several interested non-parties filed initial written submissions in response to the Commission's request for additional briefing on remedy. Respondent Spansion did not submit any briefing in response to the Commission's request. On April 20, 2009, Tessera, the IA, Respondents, and the SPIL Respondents filed reply submissions in response to the Commission's request for additional briefing on remedy. On April 20, 2009, the Commission issued a Notice in response to a motion from Broadcom extending the due date for reply submissions from interested non-parties to April 29, 2009, since the public versions of the

parties' initial submissions were not due to be filed until April 22, 2009. Notice of Commission Determination to Extend the Deadline for Receiving Reply Submission from Interested Parties in Response to the Commission's Request for Additional Briefing on Remedy (April 20, 2009). On April 29, 2009, the interested non-parties submitted their reply briefs.

On April 24, 2009, respondent Qualcomm filed a motion for leave to file a petition for reconsideration pursuant to 19 C.F.R. § 210.47 of the Commission's determination not to review the ID's finding that the asserted claims of the patents-in-suit are not indefinite. Qualcomm argued that the United States Patent and Trademark Office rejected as "indefinite" under 35 U.S.C. § 112, ¶2, new claims submitted by Tessera in connection with the reexamination of U.S. Patent No. 6,133,627, one of the parent patents of the '419 patent. Tessera filed an opposition to Qualcomm's motion on April 30, 2009. The IA filed an opposition on May 4, 2009. Qualcomm filed a reply to Tessera's and the IA's oppositions on May 5, 2009.

Having examined the record of this investigation, including the ALJ's final ID, the Commission has determined to reverse the ID's determination of no violation of the '326 patent and '419 patent. Specifically, the Commission reverses the ID's finding that Respondents' accused devices do not infringe asserted claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and asserted claims 1-11, 14, 15, 19, and 22-24 of the '419 patent. The Commission further reverses the ID's conclusion regarding waiver with respect to any claims that the accused chip packages indirectly infringe the asserted claims of the '419 patent. Moreover, the Commission finds that Respondents have contributorily infringed the asserted claims of the '419 patent. The Commission also modifies the ID's analysis concerning its finding that the '326 and '419 patents are not invalid under 35 U.S.C. § 102(b) to clarify that the statute requires comparing the on-sale date of alleged prior art against the priority date of the asserted patents, not against the conception date of the asserted patents.

The Commission has determined that the appropriate form of relief is (1) a limited exclusion order under 19 U.S.C. § 1337(d)(1) prohibiting the unlicensed entry of semiconductor chips with minimized chip package size and products incorporating these chips that infringe one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and claims 1-11, 14, 15, 19, and 22-24 of the '419 patent, and are manufactured abroad by or on behalf of, or imported by or on behalf of, Spansion, Qualcomm, ATI, Motorola, ST-NV, and Freescale; and (2) cease and desist orders directed to Motorola, Qualcomm, Freescale, and Spansion.

The Commission has further determined that the public interest factors enumerated in Section 337(d) and (f) (19 U.S.C. § 1337(d), (f)) do not preclude issuance of the limited exclusion order and the cease and desist orders. The Commission has determined that the bond for temporary importation during the period of Presidential review (19 U.S.C. § 1337(j)) shall be in the amount of 3.5% of the value of the imported articles that are subject to the order. The Commission's order was delivered to the President and the United States Trade Representative on the day of its issuance.

Additionally, the Commission denies the motion by the SPIL Respondents to extend the

date for reply submissions to the Commission's Notice of Review of the final ID and to compel the production of Tessera's initial confidential briefing in response to the Commission's Notice of Review. The Commission further denies Spansion's motion for a stay of the investigation in light of the commencement of bankruptcy proceedings involving it. The Commission also denies respondent Qualcomm's motion for leave to file a petition for reconsideration of the Commission's determination not to review the ID's finding that the asserted claims of the patents-in-suit are not indefinite. Finally, the Commission denies Respondents' motion to strike the Prowse Affidavit and the Cassidy Statement.

The authority for the Commission's determination is contained in Section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337), and in sections 210.42-50 of the Commission's Rules of Practice and Procedure (19 C.F.R. §§ 210.42-50).

By order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: May 20, 2009

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	
CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME	**Inv. No. 337-TA-605**

LIMITED EXCLUSION ORDER

The Commission has determined that there is a violation of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) in the unlawful importation, sale for importation and sale after importation by respondents Spansion Inc., Spansion, LLC (collectively "Spansion"), QUALCOMM, Inc., ATI Technologies ULC, Motorola, Inc., STMicroelectronics N.V., and Freescale Semiconductor, Inc. (hereinafter"Respondents") of certain semiconductor chips with minimized chip package size and products containing same that infringe claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 ("the '326 patent") and claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 ("the '419 patent").

Having reviewed the record in this investigation, including the written submissions of the parties, the Commission has made its determination on the issues of remedy, the public interest, and bonding. The Commission has determined that the appropriate form of relief is a limited exclusion order prohibiting the unlicensed entry of semiconductor chips with minimized chip package size and products containing same that infringe the '326 and '419 patents and are manufactured by or on behalf of Respondents, or their affiliated companies, parents, subsidiaries, licensees, contractors, or other related business entities, or successors or assigns. The Commission has also determined that the appropriate form of relief includes cease and desist

orders against four of the named Respondents: Spansion, Qualcomm, Inc., Motorola, Inc., and Freescale Semiconductor, Inc.

The Commission has further determined that the public interest factors enumerated in 19 U.S.C. § 1337(d) do not preclude issuance of the limited exclusion order or cease and desist orders, and that the bond shall be in the amount of 3.5% of the entered value of semiconductor chips with minimized chip package size and products containing same that are subject to this Order during the Presidential review period.

Accordingly, the Commission hereby **ORDERS** that:

1. Semiconductor chips with minimized chip package size and products containing same covered by one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 or one or more of claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 that are manufactured by or on behalf of, or imported by or on behalf of Respondents, or any of their affiliated companies, parents, subsidiaries, or other related business entities, or their successors or assigns, are excluded from entry for consumption into the United States, entry for consumption from a foreign-trade zone, or withdrawal from a warehouse for consumption, for the remaining term of the patents, except under license of the patent owner or as provided by law.

2. Products that are excluded by paragraph 1 of this Order are entitled to entry for consumption into the United States, entry for consumption from a foreign-trade zone, or withdrawal from a warehouse for consumption, under bond in the amount of 3.5% of the entered value pursuant to subsection (j) of the section 337 of the Tariff Act of 1930, as amended, 19 U.S. C. § 1337(j), and the Presidential Memorandum for the United States Trade Representative of

July 21, 2005 (70 *Fed. Reg.* 43251) from the day after this Order is received by the United States Trade Representative, until such time as the United States Trade Representative notifies the Commission that this action is approved or disapproved but, in any event, not later than sixty (60) days after the date of receipt of this action.

3. At the discretion of U.S. Customs and Border Protection ("CPB") and pursuant to procedures it establishes, persons seeking to import semiconductor chips with minimized chip package size and products containing same that are potentially subject to this Order may be required to certify that they are familiar with the terms of this Order, that they have made appropriate inquiry, and thereupon state that, to the best of their knowledge and belief, the products being imported are not excluded from entry under paragraph 1 of this Order. At its discretion, CBP may require persons who have provided the certification described in this paragraph to furnish such records or analyses as are necessary to substantiate the certification.

4. In accordance with 19 U.S.C. § 1337(l), the provisions of this Order shall not apply to semiconductor chips with minimized chip package size and products containing same that are imported by and for the use of the United States, or imported for, and to be used for, the United States with the authorization or consent of the Government.

5. The Commission may modify this Order in accordance with the procedures described in Rule 210.76 of the Commission Rules of Practice. 19 C.F.R. § 210.76.

6. The Secretary shall serve copies of this Order upon each party of record in this investigation and upon the Department of Health and Human Services, the Department of Justice, the Federal Trade Commission, and CBP.

7. Notice of this Order shall be published in the *Federal Register*.

By Order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: May 20, 2009

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	
CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME	**Inv. No. 337-TA-605**

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT Freescale Semiconductor, Inc., 6501 William Cannon Drive West, Austin, Texas 78736 cease and desist from conducting any of the following activities in the United States: importing, selling, marketing, advertising, distributing, offering for sale, transferring (except for exportation), and soliciting U.S. agents or distributors for, semiconductor chips with minimized chip package size and products containing same that are covered by one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 ("the '326 patent") and claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 ("the '419 patent"), in violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337.

I.

Definitions

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Tessera, Inc. of 3099 Orchard Drive, San Jose, California, 95134.

(C) "Respondent" means Freescale Semiconductor, Inc., 6501 William Cannon Drive West, Austin, Texas 78736 .

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business entity other than Respondent or its majority owned or controlled subsidiaries, successors, or assigns.

(E) "United States" shall mean the fifty States, the District of Columbia, and Puerto Rico.

(F) The terms "import" and "importation" refer to importation for entry for consumption under the Customs laws of the United States.

(G) The term "covered products" shall mean semiconductor chips with minimized chip package size and products containing same that are covered by one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and claims 1-11, 14, 15, 19, and 22-24 of the '419 patent.

II.

Applicability

The provisions of this Cease and Desist Order shall apply to Respondent and to any of its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns, and to each of them, insofar as they are engaging in conduct prohibited by Section III, *infra*, for, with, or otherwise on behalf of Respondent.

III.

Conduct Prohibited

The following conduct of Respondent in the United States is prohibited by the Order. For the remaining term of the respective patents, Respondent shall not:

(A) import or sell for importation into the United States covered products;

(B) market, distribute, offer for sale, sell, or otherwise transfer (except for exportation), in the United States imported covered products;

(C) advertise imported covered products in the United States;

(D) solicit U.S. agents or distributors for imported covered products; or

(E) aid or abet other entities in the importation, sale for importation, sale after importation, transfer, or distribution of covered products.

IV.

Conduct Permitted

Notwithstanding any other provision of this Order, specific conduct otherwise prohibited by the terms of this Order shall be permitted if, in a written instrument, the owner of U.S. Patent Nos. 5,852,326 and 6,433,419 licenses or authorizes such specific conduct, or such specific conduct is related to the importation or sale of covered products by or for the United States.

V.

Reporting

For purposes of this reporting requirement, the reporting periods shall commence on July 1 of each year and shall end on the subsequent June 30. However, the first report required under this section shall cover the period from the date of issuance of this Order through June 30, 2009. This reporting requirement shall continue in force until such time as Respondent will have truthfully reported, in two consecutive timely filed reports, that it has no inventory of covered products in the United States.

Within thirty (30) days of the last day of the reporting period, Respondent shall report to

the Commission the quantity in units and the value in dollars of covered products that Respondent has imported or sold in the United States after importation during the reporting period and the quantity in units and value in dollars of reported covered products that remain in inventory in the United States at the end of the reporting period.

VI.

Record-keeping and Inspection

(A) For the purpose of securing compliance with this Order, Respondent shall retain any and all records relating to the sale, offer for sale, marketing, or distribution in the United States of covered products, made and received in the usual and ordinary course of business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this Order and for no other purpose, and subject to any privilege recognized by the federal courts of the United States, duly authorized representatives of the Commission, upon reasonable written notice by the Commission or its staff, shall be permitted access and the right to inspect and copy in Respondent's principal offices during office hours, and in the presence of counsel or other representatives if Respondent so choose, all books, ledgers, accounts, correspondence, memoranda, and other records and documents, both in detail and in summary form as are required to be retained by subparagraph VI(A) of this Order.

Any failure to make the required report or the filing of any false or inaccurate report shall constitute a violation of this Order, and the submission of a false or inaccurate report may be referred to the U.S. Department of Justice as a possible criminal violation of 18 U.S.C. § 1001.

VII.

Service of Cease and Desist Order

Respondent is ordered and directed to:

(A) Serve, within fifteen (15) days after the effective date of this Order, a copy of this Order upon each of its respective officers, directors, managing agents, agents, and employees who have any responsibility for the importation, marketing, distribution, or sale of imported covered products in the United States;

(B) Serve, within fifteen (15) days after the succession of any persons referred to in subparagraph VII (A) of this Order, a copy of the Order upon each successor; and

(C) Maintain such records as will show the name, title, and address of each person upon whom the Order has been served, as described in subparagraphs VII(A) and VII(B) of this Order, together with the date on which service was made.

The obligations set forth in subparagraphs VII(B) and VII(C) shall remain in effect until the date of expiration of U.S. Patent Nos. 5,852,326 and 6,433,419, whichever is later.

VIII.

Confidentiality

Any request for confidential treatment of information obtained by the Commission pursuant to Sections V and VI of this Order should be in accordance with Commission Rule 201.6, 19 C.F.R. § 201.6. For all reports for which confidential treatment is sought, Respondent must provide a public version of such report with confidential information redacted.

IX.

Enforcement

Violation of this Order may result in any of the actions specified in section 210.75 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.75, including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930, 19 U.S.C. § 1337(f), and any other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information.

X.

Modification

The Commission may amend this Order on its own motion or in accordance with the procedure described in section 210.76 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.76.

XI.

Bonding

The conduct prohibited by Section III of this Order may be continued during the sixty (60) day period in which this Order is under review by the United States Trade Representative as delegated by the President, 70 *Fed Reg* 43251 (July 21, 2005), subject to Respondent posting a bond of in the amount of 3.5% of the per unit entered value of the covered products. This bond provision does not apply to conduct that is otherwise permitted by Section IV of this Order. Covered products imported on or after the date of issuance of this order are subject to the entry bond as set forth in the limited exclusion order issued by the Commission, and are not subject to

this bond provision.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders. *See* Commission Rule 210.68, 19 C.F.R. § 210.68. The bond and any accompanying documentation is to be provided to and approved by the Commission prior to the commencement of conduct which is otherwise prohibited by Section III of this Order.

The bond is to be forfeited in the event that the United States Trade Representative approves, or does not disapprove within the review period, this Order, unless the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or unless Respondent exports the products subject to this bond or destroys them and provides certification to that effect satisfactory to the Commission.

The bond is to be released in the event the United States Trade Representative disapproves this Order and no subsequent order is issued by the Commission and approved, or not disapproved, by the United States Trade Representative, upon service on Respondent of an order issued by the Commission based upon application therefore made by Respondent to the Commission.

By Order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: May 20, 2009

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	
CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME	**Inv. No. 337-TA-605**

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT Motorola, Inc., 1303 E. Algonquin Road, Schaumburg, Illinois 60196 cease and desist from conducting any of the following activities in the United States: importing, selling, marketing, advertising, distributing, offering for sale, transferring (except for exportation), and soliciting U.S. agents or distributors for, semiconductor chips with minimized chip package size and products containing same that are covered by one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 ("the '326 patent") and claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 ("the '419 patent"), in violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337.

I.

Definitions

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Tessera, Inc. of 3099 Orchard Drive, San Jose, California, 95134.

(C) "Respondent" means Motorola, Inc., 1303 E. Algonquin Road, Schaumburg, Illinois 60196.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business entity other than Respondent or its majority owned or controlled subsidiaries, successors, or assigns.

(E) "United States" shall mean the fifty States, the District of Columbia, and Puerto Rico.

(F) The terms "import" and "importation" refer to importation for entry for consumption under the Customs laws of the United States.

(G) The term "covered products" shall mean semiconductor chips with minimized chip package size and products containing same that are covered by one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and claims 1-11, 14, 15, 19, and 22-24 of the '419 patent.

II.

Applicability

The provisions of this Cease and Desist Order shall apply to Respondent and to any of its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns, and to each of them, insofar as they are engaging in conduct prohibited by Section III, *infra*, for, with, or otherwise on behalf of Respondent.

III.

Conduct Prohibited

The following conduct of Respondent in the United States is prohibited by the Order. For the remaining term of the respective patents, Respondent shall not:

(A) import or sell for importation into the United States covered products;

(B) market, distribute, offer for sale, sell, or otherwise transfer (except for exportation), in the United States imported covered products;

(C) advertise imported covered products in the United States;

(D) solicit U.S. agents or distributors for imported covered products; or

(E) aid or abet other entities in the importation, sale for importation, sale after importation, transfer, or distribution of covered products.

IV.

Conduct Permitted

Notwithstanding any other provision of this Order, specific conduct otherwise prohibited by the terms of this Order shall be permitted if, in a written instrument, the owner of U.S. Patent Nos. 5,852,326 and 6,433,419 licenses or authorizes such specific conduct, or such specific conduct is related to the importation or sale of covered products by or for the United States.

V.

Reporting

For purposes of this reporting requirement, the reporting periods shall commence on July 1 of each year and shall end on the subsequent June 30. However, the first report required under this section shall cover the period from the date of issuance of this Order through June 30, 2009. This reporting requirement shall continue in force until such time as Respondent will have truthfully reported, in two consecutive timely filed reports, that it has no inventory of covered products in the United States.

Within thirty (30) days of the last day of the reporting period, Respondent shall report to

the Commission the quantity in units and the value in dollars of covered products that Respondent has imported or sold in the United States after importation during the reporting period and the quantity in units and value in dollars of reported covered products that remain in inventory in the United States at the end of the reporting period.

VI.

Record-keeping and Inspection

(A) For the purpose of securing compliance with this Order, Respondent shall retain any and all records relating to the sale, offer for sale, marketing, or distribution in the United States of covered products, made and received in the usual and ordinary course of business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this Order and for no other purpose, and subject to any privilege recognized by the federal courts of the United States, duly authorized representatives of the Commission, upon reasonable written notice by the Commission or its staff, shall be permitted access and the right to inspect and copy in Respondent's principal offices during office hours, and in the presence of counsel or other representatives if Respondent so choose, all books, ledgers, accounts, correspondence, memoranda, and other records and documents, both in detail and in summary form as are required to be retained by subparagraph VI(A) of this Order.

Any failure to make the required report or the filing of any false or inaccurate report shall constitute a violation of this Order, and the submission of a false or inaccurate report may be referred to the U.S. Department of Justice as a possible criminal violation of 18 U.S.C. § 1001.

VII.

Service of Cease and Desist Order

Respondent is ordered and directed to:

(A) Serve, within fifteen (15) days after the effective date of this Order, a copy of this Order upon each of its respective officers, directors, managing agents, agents, and employees who have any responsibility for the importation, marketing, distribution, or sale of imported covered products in the United States;

(B) Serve, within fifteen (15) days after the succession of any persons referred to in subparagraph VII (A) of this Order, a copy of the Order upon each successor; and

(C) Maintain such records as will show the name, title, and address of each person upon whom the Order has been served, as described in subparagraphs VII(A) and VII(B) of this Order, together with the date on which service was made.

The obligations set forth in subparagraphs VII(B) and VII(C) shall remain in effect until the date of expiration of U.S. Patent Nos. 5,852,326 and 6,433,419, whichever is later.

VIII.

Confidentiality

Any request for confidential treatment of information obtained by the Commission pursuant to Sections V and VI of this Order should be in accordance with Commission Rule 201.6, 19 C.F.R. § 201.6. For all reports for which confidential treatment is sought, Respondent must provide a public version of such report with confidential information redacted.

IX.

Enforcement

Violation of this Order may result in any of the actions specified in section 210.75 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.75, including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930, 19 U.S.C. § 1337(f), and any other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information.

X.

Modification

The Commission may amend this Order on its own motion or in accordance with the procedure described in section 210.76 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.76.

XI.

Bonding

The conduct prohibited by Section III of this Order may be continued during the sixty (60) day period in which this Order is under review by the United States Trade Representative as delegated by the President, 70 *Fed Reg* 43251 (July 21, 2005), subject to Respondent posting a bond of in the amount of 3.5% of the per unit entered value of the covered products. This bond provision does not apply to conduct that is otherwise permitted by Section IV of this Order. Covered products imported on or after the date of issuance of this order are subject to the entry bond as set forth in the limited exclusion order issued by the Commission, and are not subject to

this bond provision.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders. *See* Commission Rule 210.68, 19 C.F.R. § 210.68. The bond and any accompanying documentation is to be provided to and approved by the Commission prior to the commencement of conduct which is otherwise prohibited by Section III of this Order.

The bond is to be forfeited in the event that the United States Trade Representative approves, or does not disapprove within the review period, this Order, unless the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or unless Respondent exports the products subject to this bond or destroys them and provides certification to that effect satisfactory to the Commission.

The bond is to be released in the event the United States Trade Representative disapproves this Order and no subsequent order is issued by the Commission and approved, or not disapproved, by the United States Trade Representative, upon service on Respondent of an order issued by the Commission based upon application therefore made by Respondent to the Commission.

By Order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: May 20, 2009

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	
CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME	**Inv. No. 337-TA-605**

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT QUALCOMM Incorporated, 5775 Morehouse Drive, San Diego, California 92121 cease and desist from conducting any of the following activities in the United States: importing, selling, marketing, advertising, distributing, offering for sale, transferring (except for exportation), and soliciting U.S. agents or distributors for, semiconductor chips with minimized chip package size and products containing same that are covered by one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 ("the '326 patent") and claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 ("the '419 patent"), in violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337.

I.

Definitions

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Tessera, Inc. of 3099 Orchard Drive, San Jose, California, 95134.

(C) "Respondent" means QUALCOMM Incorporated, 5775 Morehouse Drive, San Diego, California 92121.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business entity other than Respondent or its majority owned or controlled subsidiaries, successors, or assigns.

(E) "United States" shall mean the fifty States, the District of Columbia, and Puerto Rico.

(F) The terms "import" and "importation" refer to importation for entry for consumption under the Customs laws of the United States.

(G) The term "covered products" shall mean semiconductor chips with minimized chip package size and products containing same that are covered by one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and claims 1-11, 14, 15, 19, and 22-24 of the '419 patent.

II.

Applicability

The provisions of this Cease and Desist Order shall apply to Respondent and to any of its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns, and to each of them, insofar as they are engaging in conduct prohibited by Section III, *infra*, for, with, or otherwise on behalf of Respondent.

III.

Conduct Prohibited

The following conduct of Respondent in the United States is prohibited by the Order. For the remaining term of the respective patents, Respondent shall not:

(A) import or sell for importation into the United States covered products;

(B) market, distribute, offer for sale, sell, or otherwise transfer (except for exportation), in the United States imported covered products;

(C) advertise imported covered products in the United States;

(D) solicit U.S. agents or distributors for imported covered products; or

(E) aid or abet other entities in the importation, sale for importation, sale after importation, transfer, or distribution of covered products.

IV.

Conduct Permitted

Notwithstanding any other provision of this Order, specific conduct otherwise prohibited by the terms of this Order shall be permitted if, in a written instrument, the owner of U.S. Patent Nos. 5,852,326 and 6,433,419 licenses or authorizes such specific conduct, or such specific conduct is related to the importation or sale of covered products by or for the United States.

V.

Reporting

For purposes of this reporting requirement, the reporting periods shall commence on July 1 of each year and shall end on the subsequent June 30. However, the first report required under this section shall cover the period from the date of issuance of this Order through June 30, 2009. This reporting requirement shall continue in force until such time as Respondent will have truthfully reported, in two consecutive timely filed reports, that it has no inventory of covered products in the United States.

Within thirty (30) days of the last day of the reporting period, Respondent shall report to

the Commission the quantity in units and the value in dollars of covered products that Respondent has imported or sold in the United States after importation during the reporting period and the quantity in units and value in dollars of reported covered products that remain in inventory in the United States at the end of the reporting period.

VI.

Record-keeping and Inspection

(A) For the purpose of securing compliance with this Order, Respondent shall retain any and all records relating to the sale, offer for sale, marketing, or distribution in the United States of covered products, made and received in the usual and ordinary course of business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this Order and for no other purpose, and subject to any privilege recognized by the federal courts of the United States, duly authorized representatives of the Commission, upon reasonable written notice by the Commission or its staff, shall be permitted access and the right to inspect and copy in Respondent's principal offices during office hours, and in the presence of counsel or other representatives if Respondent so choose, all books, ledgers, accounts, correspondence, memoranda, and other records and documents, both in detail and in summary form as are required to be retained by subparagraph VI(A) of this Order.

Any failure to make the required report or the filing of any false or inaccurate report shall constitute a violation of this Order, and the submission of a false or inaccurate report may be referred to the U.S. Department of Justice as a possible criminal violation of 18 U.S.C. § 1001.

VII.

Service of Cease and Desist Order

Respondent is ordered and directed to:

(A) Serve, within fifteen (15) days after the effective date of this Order, a copy of this Order upon each of its respective officers, directors, managing agents, agents, and employees who have any responsibility for the importation, marketing, distribution, or sale of imported covered products in the United States;

(B) Serve, within fifteen (15) days after the succession of any persons referred to in subparagraph VII (A) of this Order, a copy of the Order upon each successor; and

(C) Maintain such records as will show the name, title, and address of each person upon whom the Order has been served, as described in subparagraphs VII(A) and VII(B) of this Order, together with the date on which service was made.

The obligations set forth in subparagraphs VII(B) and VII(C) shall remain in effect until the date of expiration of U.S. Patent Nos. 5,852,326 and 6,433,419, whichever is later.

VIII.

Confidentiality

Any request for confidential treatment of information obtained by the Commission pursuant to Sections V and VI of this Order should be in accordance with Commission Rule 201.6, 19 C.F.R. § 201.6. For all reports for which confidential treatment is sought, Respondent must provide a public version of such report with confidential information redacted.

IX.

Enforcement

Violation of this Order may result in any of the actions specified in section 210.75 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.75, including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930, 19 U.S.C. § 1337(f), and any other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information.

X.

Modification

The Commission may amend this Order on its own motion or in accordance with the procedure described in section 210.76 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.76.

XI.

Bonding

The conduct prohibited by Section III of this Order may be continued during the sixty (60) day period in which this Order is under review by the United States Trade Representative as delegated by the President, 70 *Fed Reg* 43251 (July 21, 2005), subject to Respondent posting a bond of in the amount of 3.5% of the per unit entered value of the covered products. This bond provision does not apply to conduct that is otherwise permitted by Section IV of this Order. Covered products imported on or after the date of issuance of this order are subject to the entry bond as set forth in the limited exclusion order issued by the Commission, and are not subject to

this bond provision.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders. *See* Commission Rule 210.68, 19 C.F.R. § 210.68. The bond and any accompanying documentation is to be provided to and approved by the Commission prior to the commencement of conduct which is otherwise prohibited by Section III of this Order.

The bond is to be forfeited in the event that the United States Trade Representative approves, or does not disapprove within the review period, this Order, unless the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or unless Respondent exports the products subject to this bond or destroys them and provides certification to that effect satisfactory to the Commission.

The bond is to be released in the event the United States Trade Representative disapproves this Order and no subsequent order is issued by the Commission and approved, or not disapproved, by the United States Trade Representative, upon service on Respondent of an order issued by the Commission based upon application therefore made by Respondent to the Commission.

By Order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: May 20, 2009

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	
CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME	**Inv. No. 337-TA-605**

ORDER TO CEASE AND DESIST

IT IS HEREBY ORDERED THAT Spansion Inc. and Spansion LLC, 915 DeGuigne Drive, P.O. Box 3453, Sunnyvale, California 94088, cease and desist from conducting any of the following activities in the United States: importing, selling, marketing, advertising, distributing, offering for sale, transferring (except for exportation), and soliciting U.S. agents or distributors for, semiconductor chips with minimized chip package size and products containing same that are covered by one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 ("the '326 patent") and claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 ("the '419 patent"), in violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337.

I.

Definitions

As used in this Order:

(A) "Commission" shall mean the United States International Trade Commission.

(B) "Complainant" shall mean Tessera, Inc. of 3099 Orchard Drive, San Jose, California, 95134.

(C) "Respondent" means Spansion Inc. and Spansion LLC, 915 DeGuigne Drive, P.O. Box 3453, Sunnyvale, California 94088.

(D) "Person" shall mean an individual, or any non-governmental partnership, firm, association, corporation, or other legal or business entity other than Respondent or its majority owned or controlled subsidiaries, successors, or assigns.

(E) "United States" shall mean the fifty States, the District of Columbia, and Puerto Rico.

(F) The terms "import" and "importation" refer to importation for entry for consumption under the Customs laws of the United States.

(G) The term "covered products" shall mean semiconductor chips with minimized chip package size and products containing same that are covered by one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and claims 1-11, 14, 15, 19, and 22-24 of the '419 patent.

II.

Applicability

The provisions of this Cease and Desist Order shall apply to Respondent and to any of its principals, stockholders, officers, directors, employees, agents, licensees, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns, and to each of them, insofar as they are engaging in conduct prohibited by Section III, *infra*, for, with, or otherwise on behalf of Respondent.

III.

Conduct Prohibited

The following conduct of Respondent in the United States is prohibited by the Order. For the remaining term of the respective patents, Respondent shall not:

(A) import or sell for importation into the United States covered products;

(B) market, distribute, offer for sale, sell, or otherwise transfer (except for exportation), in the United States imported covered products;

(C) advertise imported covered products in the United States;

(D) solicit U.S. agents or distributors for imported covered products; or

(E) aid or abet other entities in the importation, sale for importation, sale after importation, transfer, or distribution of covered products.

IV.

Conduct Permitted

Notwithstanding any other provision of this Order, specific conduct otherwise prohibited by the terms of this Order shall be permitted if, in a written instrument, the owner of U.S. Patent Nos. 5,852,326 and 6,433,419 licenses or authorizes such specific conduct, or such specific conduct is related to the importation or sale of covered products by or for the United States.

V.

Reporting

For purposes of this reporting requirement, the reporting periods shall commence on July 1 of each year and shall end on the subsequent June 30. However, the first report required under this section shall cover the period from the date of issuance of this Order through June 30, 2009. This reporting requirement shall continue in force until such time as Respondent will have truthfully reported, in two consecutive timely filed reports, that it has no inventory of covered products in the United States.

Within thirty (30) days of the last day of the reporting period, Respondent shall report to

the Commission the quantity in units and the value in dollars of covered products that Respondent has imported or sold in the United States after importation during the reporting period and the quantity in units and value in dollars of reported covered products that remain in inventory in the United States at the end of the reporting period.

VI.

Record-keeping and Inspection

(A) For the purpose of securing compliance with this Order, Respondent shall retain any and all records relating to the sale, offer for sale, marketing, or distribution in the United States of covered products, made and received in the usual and ordinary course of business, whether in detail or in summary form, for a period of three (3) years from the close of the fiscal year to which they pertain.

(B) For the purpose of determining or securing compliance with this Order and for no other purpose, and subject to any privilege recognized by the federal courts of the United States, duly authorized representatives of the Commission, upon reasonable written notice by the Commission or its staff, shall be permitted access and the right to inspect and copy in Respondent's principal offices during office hours, and in the presence of counsel or other representatives if Respondent so choose, all books, ledgers, accounts, correspondence, memoranda, and other records and documents, both in detail and in summary form as are required to be retained by subparagraph VI(A) of this Order.

Any failure to make the required report or the filing of any false or inaccurate report shall constitute a violation of this Order, and the submission of a false or inaccurate report may be referred to the U.S. Department of Justice as a possible criminal violation of 18 U.S.C. § 1001.

VII.

Service of Cease and Desist Order

Respondent is ordered and directed to:

(A) Serve, within fifteen (15) days after the effective date of this Order, a copy of this Order upon each of its respective officers, directors, managing agents, agents, and employees who have any responsibility for the importation, marketing, distribution, or sale of imported covered products in the United States;

(B) Serve, within fifteen (15) days after the succession of any persons referred to in subparagraph VII (A) of this Order, a copy of the Order upon each successor; and

(C) Maintain such records as will show the name, title, and address of each person upon whom the Order has been served, as described in subparagraphs VII(A) and VII(B) of this Order, together with the date on which service was made.

The obligations set forth in subparagraphs VII(B) and VII(C) shall remain in effect until the date of expiration of U.S. Patent Nos. 5,852,326 and 6,433,419, whichever is later.

VIII.

Confidentiality

Any request for confidential treatment of information obtained by the Commission pursuant to Sections V and VI of this Order should be in accordance with Commission Rule 201.6, 19 C.F.R. § 201.6. For all reports for which confidential treatment is sought, Respondent must provide a public version of such report with confidential information redacted.

IX.

Enforcement

Violation of this Order may result in any of the actions specified in section 210.75 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.75, including an action for civil penalties in accordance with section 337(f) of the Tariff Act of 1930, 19 U.S.C. § 1337(f), and any other action as the Commission may deem appropriate. In determining whether Respondent is in violation of this Order, the Commission may infer facts adverse to Respondent if Respondent fails to provide adequate or timely information.

X.

Modification

The Commission may amend this Order on its own motion or in accordance with the procedure described in section 210.76 of the Commission's Rules of Practice and Procedure, 19 C.F.R. § 210.76.

XI.

Bonding

The conduct prohibited by Section III of this Order may be continued during the sixty (60) day period in which this Order is under review by the United States Trade Representative as delegated by the President, 70 *Fed Reg* 43251 (July 21, 2005), subject to Respondent posting a bond of in the amount of 3.5% of the per unit entered value of the covered products. This bond provision does not apply to conduct that is otherwise permitted by Section IV of this Order. Covered products imported on or after the date of issuance of this order are subject to the entry bond as set forth in the limited exclusion order issued by the Commission, and are not subject to

this bond provision.

The bond is to be posted in accordance with the procedures established by the Commission for the posting of bonds by complainants in connection with the issuance of temporary exclusion orders. *See* Commission Rule 210.68, 19 C.F.R. § 210.68. The bond and any accompanying documentation is to be provided to and approved by the Commission prior to the commencement of conduct which is otherwise prohibited by Section III of this Order.

The bond is to be forfeited in the event that the United States Trade Representative approves, or does not disapprove within the review period, this Order, unless the U.S. Court of Appeals for the Federal Circuit, in a final judgment, reverses any Commission final determination and order as to Respondent on appeal, or unless Respondent exports the products subject to this bond or destroys them and provides certification to that effect satisfactory to the Commission.

The bond is to be released in the event the United States Trade Representative disapproves this Order and no subsequent order is issued by the Commission and approved, or not disapproved, by the United States Trade Representative, upon service on Respondent of an order issued by the Commission based upon application therefore made by Respondent to the Commission.

By Order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: May 20, 2009

CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME **337-TA-605**

PUBLIC CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **NOTICE OF COMMISSION FINAL DETERMINATION OF VIOLATION OF SECTION 337; TERMINATION OF INVESTIGATION; ISSUANCE OF LIMITED EXCLUSION ORDER AND CEASE AND DESIST ORDERS** has been served by hand upon the Commission Investigative Attorney, Jeffrey T. Hsu, Esq., and the following parties as indicated, on May 20, 2009.

Marilyn R. Abbott, Secretary
U.S. International Trade Commission
500 E Street, SW
Washington, DC 20436

ON BEHALF OF COMPLAINANT TESSERA, INC.:

Barbara A. Murphy, Esq.
MILLER & CHEVALIER CHARTERED
655 Fifteenth Street, NW – Suite 900
Washington, DC 20005
P-202-626-5800
P- 202-626-5801

( ) Via Hand Delivery
(X) Via Overnight Mail
( ) Via First Class Mail
( ) Other: _____

ON BEHALF OF RESPONDENTS SPANSION INCORPORATED AND SPANSION LLC:

Alexander J. Hadjis, Esq.
MORRISION & FOERSTER, LLP
2000 Pennsylvania Avenue, NW
Washington, DC 20006

( ) Via Hand Delivery
(X) Via Overnight Mail
( ) Via First Class Mail
( ) Other: _____

ON BEHALF OF RESPONDENT QUALCOMM INCORPORATED:

Bert C. Reiser, Esq.
HOWREY LLP
1299 Pennsylvania Avenue, NW
Washington, DC 20004
P-202-782-0800
F-202-383-6610

( ) Via Hand Delivery
(X) Via Overnight Mail
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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME**	**Investigation No. 337-TA-605**

OPINION

I. BACKGROUND

The Commission instituted this investigation on May 21, 2007, based on a complaint filed by Tessera, Inc. of San Jose, California ("Tessera") against Spansion, Inc. and Spansion, LLC, both of Sunnyvale, California (collectively "Spansion"); QUALCOMM, Inc. of San Diego, California ("Qualcomm"); ATI Technologies of Thornhill, Ontario, Canada ("ATI"); Motorola, Inc. of Schaumburg, Illinois ("Motorola"); STMicroelectronics N.V. of Geneva, Switzerland ("ST-NV"); and Freescale Semiconductor, Inc. of Austin, Texas ("Freescale"). 72 *Fed. Reg.* 28522 (May 21, 2007). The complaint alleges violations of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("Section 337"), in the importation into the United States, the sale for importation, and the sale within the United States after importation of certain semiconductor chips with minimized chip package size or products containing same by reason of infringement of one or more claims of U.S. Patent Nos. 5,852,326 ("the '326 patent") and 6,433,419 ("the '419 patent").

On December 1, 2008, the presiding administrative law judge ("ALJ") issued his final ID finding no violation of Section 337 by Respondents. On January 30, 2009, the Commission determined to review the final ID in part and requested briefing on the issues it determined to review, remedy, the public interest, and bonding. 74 *Fed. Reg.* 6175-6 (Feb. 5, 2009).

On May 20, 2009, the Commission determined to reverse the ID's determination of no violation of the '326 patent and '419 patent. 74 *Fed. Reg.* 25579-81 (May 28, 2009). Specifically, the Commission reversed the ID's finding that Respondents' accused devices do not infringe asserted claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and asserted claims 1-11, 14, 15, 19, and 22-24 of the '419 patent. The Commission determined that the appropriate form of relief is (1) a limited exclusion order under 19 U.S.C. § 1337(d)(1) prohibiting the unlicensed entry of semiconductor chips with minimized chip package size and products incorporating these chips that infringe one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and claims 1-11, 14, 15, 19, and 22-24 of the '419 patent, and are manufactured abroad by or on behalf of, or imported by or on behalf of, Spansion, Qualcomm, ATI, Motorola, ST-NV, and Freescale; and (2) cease and desist orders directed to Motorola,[1] Qualcomm, Freescale, and Spansion.

On June 2, 2009, respondents ATI, Freescale, Qualcomm, Spansion, and ST-NV (collectively "Respondents") filed a joint motion with the Commission to stay the limited exclusion and cease and desist orders pending the outcome of an appeal of the Commission's determination to the U.S. Court of Appeals for the Federal Circuit. Tessera and the Commission investigative attorney ("IA") filed responses opposing the motion on June 12, 2009. On June 18,

[1] Motorola has since been licensed under the '326 and '419 patents, and its products are no longer covered by the limited exclusion order or the cease and desist order.

2009, Respondents filed a motion for leave to file a joint reply in support of their motion to stay. Tessera filed an opposition to this motion on June 26, 2009.

II. DISCUSSION

The Commission has previously held that section 705 of the Administrative Procedure Act ("APA") (5 U.S.C. § 705) provides the requisite authority to stay the effective date of its orders. *Certain Agricultural Tractors Under 50 Power Take-Off Horsepower* ("*Agricultural Tractors*"), Inv. 337-TA-380, Commission Opinion (Public Version) (April 24, 1997). In determining whether to grant a motion for a stay under section 705 of the APA, the Commission has applied the four-prong test used by courts to determine whether to grant a preliminary injunction. *Id.*; *Certain EPROM, EEPROM, Flash Memory, and Flash Microcontroller Semiconductor Devices and Products Containing Same* ("*EPROMs*"), Inv. No. 337-TA-395, Comm'n Opinion at 88-90, USITC Pub. No. 3392 (February 2001); *see Cuomo v. U.S. Nuclear Regulatory Comm'n*, 772 F.2d 972 (D.C. Cir. 1985); *Washington Metro. Area Transit Comm'n v. Holiday Tours, Inc.*, 559 F.2d 841 (D.C. Cir. 1977).

The four-prong test, as applied by the Federal Circuit in considering whether to issue a stay pending appeal, requires that the movant demonstrate: (1) a likelihood of success on the merits of the appeal; (2) irreparable harm to the movant absent a stay; (3) that the issuance of a stay would not substantially harm other parties; and (4) that the public interest favors a stay. *See Standard Havens Prods. Inc. v. Gencor Indus. Inc.*, 897 F.2d 511, 512 (Fed. Cir. 1990); *Holiday Tours*, 559 F.2d at 843. The Commission, however, has held that it need not conclude that its own determination is likely to be overturned on appeal, but may find the first prong satisfied if

the Commission has ruled on "an admittedly difficult question." *Agricultural Tractors* at 10 (citing *Holiday Tours, Inc.*, 559 F.2d at 844-45).

With respect to the first factor, Respondents argue that the issues of validity of the patents and infringement present "admittedly difficult legal questions." Respondents' Joint Motion and Memorandum to Stay Enforcement of limited Exclusion Order and Cease and Desist Order (Public Version) (June 12, 2009) ("Respondents' Motion") at 1. The '326 patent is the subject of an *ex parte* reexamination proceeding before the U.S. Patent and Trademark Office's ("USPTO"). The '419 patent is the subject of an *inter partes* reexamination proceedings before the USPTO. During the course of the reexamination proceedings, the USPTO rejected all of the claims in both asserted patents. In responding to the USPTO's rejections, Tessera amended the specification of both asserted patents, but did not amend any of the claims in either patent. After the Commission issued its final determination finding a violation of Section 337 in this investigation, the USPTO issued final actions in both reexamination proceedings, maintaining its rejection of all claims in both asserted patents. Specifically, the USPTO issued an Advisory Action in the '326 reexamination proceeding on June 22, 2009, and a Right of Appeal Notice in the '419 reexamination proceeding on June 19, 2009.[2] These actions close the reexamination proceedings before the USPTO's Central Reexamination Unit and terminate the reexamination proceedings unless Tessera files an appeal in each proceeding to the USPTO's Board of Patent Appeals and Interferences ("BPAI"). Tessera has until July 22, 2009, to file an appeal in the '326 proceeding and until July 19, 2009, to file an appeal in the '419 proceeding.

[2] *See* Right of Appeal Notice in Reexamination Control No. 95/000,227 ('419 patent), mailed June 19, 2009; *see* Ex Parte Reexamination Advisory Action in Reexamination Control No. 90/008,483 ('326 patent), mailed June 22, 2009.

Respondents contend that, because the Commission's determination that the asserted claims of the patents-at-issue are not invalid is in conflict with the USPTO's final rejections of all the claims of the patents-at-issue, this case presents a difficult legal question regarding validity. Respondents' Motion at 15. We disagree. Although final rejections were issued against all of the claims of both of the patents-at-issue, none of the claims of either patent have been cancelled. Only if the rejections remain after all appeals from the reexamination proceedings have been exhausted, including any appeals to the BPAI and to the Federal Circuit, will the USPTO issue a certificate canceling the claims of the patents. 35 U.S.C. § 307. Until that occurs, the patents are presumed valid and enforceable. *See In re Bingo Card Minder Corp.*, 152 F.3d 941 (Fed. Cir. 1998). In this case, both of the asserted patents will expire in September 2010. Because of the short time remaining in the life of the '326 and '419 patents, the full reexamination process, including appeals, will take at least the remaining terms of the patents.

Neither are the USPTO's final rejections and the Commission's decision necessarily inconsistent. The USPTO applies a different standard than does a tribunal such as the Commission, or a district court, when determining the validity of claims. While the USPTO applies a "preponderance of the evidence" standard when determining the validity of claims during reexamination proceedings, the Commission must apply the more rigorous "clear and convincing evidence" standard. *See In re Zietz*, 893 F.2d 319, 322 (Fed. Cir. 1989). In applying the appropriate higher standard, both the ALJ and the Commission concluded that Respondents had not presented sufficient evidence to show that the asserted patents were invalid.

Respondents further argue that the Commission's validity rulings are erroneous. Their main assertions with respect to validity rest on their argument that Motorola's 1989 68HC11

OMPAC chip ("OMPAC") anticipated the '326 and '419 patents and that the "moveable"/"movement" limitation, which is found in each of the asserted claims of the '326 and '419 patents, is indefinite. The Commission affirmed the ALJ's finding that, under the appropriate "clear and convincing evidence" standard, Respondents had not presented sufficient evidence that the data used to model the allegedly anticipatory OMPAC was correct. *See Certain Semiconductor Chips With Minimized Chip Package Size and Products Containing Same*, Inv. No. 337-TA-605 ("*Semiconductor Chips*"), Commission Opinion (Public Version) (June 3, 2009) ("Comm'n Opinion") at 59. Moreover, the Commission did not review the ALJ's finding that because the "moveable"/"movement" limitation could be construed, those terms were not indefinite. *See* Semiconductor *Chips*, Initial Determination (Public Version) (February 9, 2009) at 104-106. As such, we do not believe that we have ruled on "an admittedly difficult legal question" in reaching our validity determination.

With respect to the Commission's infringement determination, Respondents argue that the Commission's finding of infringement lacks evidentiary support and improperly shifts the burden of proof to Respondents. Respondents' Motion at 19. Although the Commission reversed the ALJ's finding of non-infringement, the Commission ultimately did reject one of Tessera's expert's methods for demonstrating infringement. Comm'n Opinion at 33. But this fact alone is not sufficient to raise the issue of infringement to "an admittedly difficult legal question." It is the Commission, not the ALJ, that is tasked with making any final decisions regarding whether or not there is a violation of Section 337 in a given investigation. 19 U.S.C. § 1337(c). It is not an unusual practice for the Commission, after reviewing an ALJ's ID, to determine that some or all of the ALJ's conclusions are incorrect and should be reversed or

otherwise modified. Such a practice cannot, in and of itself, lead to a conclusion that there is "an admittedly difficult legal question."

Respondents also argue that the Commission reached beyond the record to support its finding of infringement and that Tessera presented a new theory of infringement to the Commission that it did not present to the ALJ. Respondents' Motion at 17-18. We reject both of these contentions. The Commission reviewed the same evidentiary record that was before the ALJ when it determined to review the ALJ's ID and when it made its final determination. The Commission carefully considered all of the parties' arguments concerning the issues of infringement and validity, and found no inconsistency with the way in which these issues were presented during the two phases of the investigation. As such, Respondents' argument is without merit.

With respect to the second factor, Respondents argue that they will be irreparably harmed in the absence of a stay due to the depressed economic climate of the semiconductor industry in general and because they may lose business. *Id.* at 19-20. We acknowledge that some harm will accrue to Respondents because of the exclusion order. We do not believe, however, that this harm rises to the level of irreparable harm. As the record reflects, the vast majority of Respondents' infringing semiconductor chips are imported into the U.S. inside downstream products, which are manufactured overseas. CX-2609C (Marcucci W.S.) at QQ.27-28, pp. 7-8 ("The large majority of [the] Respondents['s] chip packages are sold overseas and imported by product manufacturers into the United States in downstream products."). The limited exclusion order issued by the Commission, however, restricts importation of only Respondents' infringing chips themselves and does not cover their downstream products. In this respect, the bulk of

Respondents' business will be unaffected by the limited exclusion order. Furthermore, any harm that Respondents would suffer due to the limited exclusion order and cease and desist orders could be avoided if Respondents take a license from Tessera, as respondent Motorola has already done. Furthermore, the news articles Respondents submitted along with their joint motion highlight that the semiconductor industry's economic difficulties are due primarily to larger economic and market forces that have been at work for a number of years, and which began long before the Commission issued its limited exclusion order and cease and desist orders. *See* Respondents' Motion at Exhs. A and B.

With respect to the third factor, we believe that Tessera will be seriously harmed if a stay is granted pending appeal of the Commission's final determination. The '326 and '419 patents expire on September 24, 2010. The earliest Respondents can appeal the Commission's determination is July 20, 2009, the day after the period of Presidential review ends. Given the typical schedule of appeals to the Federal Circuit, it is unlikely that an appeal would be completed before mid-2010, giving Tessera only a few months of relief if the Commission's determination is upheld. Accordingly, if we were to grant a stay, Tessera would essentially be denied the relief to which it is entitled under Section 337 during pendency of the appeal. Respondents argue that Tessera can be made whole by money damages. Respondents' Motion at 20. The statute provides, however, that the remedies available for violation of Section 337 are "in addition to any other provision of law...." 19 U.S.C. § 1337(a)(1). Therefore, we reject Respondents' contention that money damages will make up for the loss of Section 337 relief.

With respect to the fourth factor, we believe that a stay would not favor the public interest. Respondents argue that the public will be harmed by the lack of competition during the

period that the accused products are excluded and that their businesses may fail in the interim. Respondents' Motion at 21. The Commission determined, however, when considering the public interest before determining to issue relief to Tessera, that there are many licensed sources for the packaged semiconductor chips of the type at issue and that there is no evidence that Tessera's licensees would be unable to adequately supply the U.S. market once Respondents' products are excluded. *Semiconductor Chips*, Commn' Op at 73-74. As to their second argument, Respondents have not demonstrated that being permitted to import the semiconductor packages at issue will affect their economic fate. Respondent Spansion entered bankruptcy before the Final Determination issued and, thus, the limited exclusion order and cease and desist order could not have contributed to the bankruptcy.[3]

Respondents also argue that the public interest is harmed by having conflicting agency determinations on the validity of the same patent claims. Respondents' Motion at 21. There is, in fact, no harm caused by conflicting rulings between the USPTO and the Commission because the Commission does not make final binding rulings on any action relating to patents, including determining their validity. That task is exclusively relegated to federal district courts (28 U.S.C. § 1338) and the USPTO. Rather, the Commission makes validity findings when considering defenses to a complainant's allegations that there has been a violation of Section 337. These validity rulings have no collateral estoppel effect outside of the Commission's own investigations. *See Texas Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1569 (Fed. Cir. 1996); s*ee also Corning Glass Works v. United States Int'l Trade Comm'n,* 799 F.2d

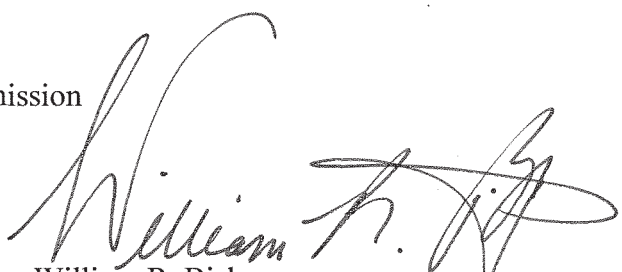
[3] *See* Notice of Commencement of Bankruptcy Proceedings and of Automatic Stay (March 11, 2009). The Commission denied Spansion's request to stay the investigation. *Semiconductor Chips*, Comm'n Opinion at 75.

1559, 1570 n. 12, (Fed. Cir. 1986) (stating that the legislative history of the Trade Reform Act of 1974 supports the position that ITC decisions have no preclusive effect regarding the validity or enforceability of patents in district courts).

Upon consideration of the four stay factors, the Commission denies Respondents' motion for stay of the Commission's remedial orders pending the outcome of any appeal of the Commission's final determination.

Respondents also filed a motion for leave to file a joint reply in support of their motion to stay. Respondents' Motion for Leave to File Joint Reply in Support of Motion to Stay Enforcement of Limited Exclusion Order and Cease and Desist Order (June 18, 2009). Respondents have not supplied a sufficient basis for filing a reply. Respondents' motion for leave is, therefore, denied.

By order of the Commission.
Marilyn R. Abbott, Secretary to the Commission



William R. Bishop
Acting Secretary to the Commission

Issued: July 29, 2009

CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME **337-TA-605**

PUBLIC CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **PUBLIC OPINION** has been served by hand upon the Commission Investigative Attorney, Jeffrey T. Hsu, Esq., and the following parties as indicated, on July 29, 2009.

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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of	Inv. No. 337-TA-605
CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME	

COMMISSION OPINION

I. BACKGROUND

A. Procedural History

The Commission instituted Inv. No. 337-TA-605 on May 21, 2007, based on a complaint filed by Tessera, Inc. of San Jose, California ("Tessera") on April 17, 2007. 72 *Fed. Reg.* 28521-2 (May 21, 2007). The complaint, as amended, alleged violations of Section 337 of the Tariff Act of 1930, 19 U.S.C. § 1337 ("Section 337") in the importation into the United States, the sale for importation, and the sale within the United States after importation of semiconductor chips with minimized chip package size or products containing same by reason of infringement of certain claims of U.S. Patent Nos. 5,852,326 ("the '326 patent") and 6,433,419 ("the '419 patent"). Tessera named as respondents Spansion, Inc. and Spansion, LLC, both of Sunnyvale, California (collectively "Spansion"); QUALCOMM, Inc. of San Diego, California ("Qualcomm"); ATI Technologies of Thornhill, Ontario, Canada ("ATI"); Motorola, Inc. of Schaumburg, Illinois ("Motorola"); STMicroelectronics N.V. of Geneva, Switzerland ("ST-NV"); and Freescale Semiconductor, Inc. of Austin, Texas ("Freescale") (collectively "Respondents").

On December 1, 2008, the presiding administrative law judge ("ALJ") issued his final initial determination ("ID"), finding no violation of Section 337, as well as his recommended determination ("RD") on remedy and bonding during the period of Presidential review. Specifically, the ID finds that the accused products do not infringe the asserted claims of either the '326 patent or the '419 patent. The ALJ also determined that the asserted claims of the '326 and '419 patents are not invalid for failing to satisfy the enablement requirement of 35 U.S.C. § 112 ¶

1, are not invalid for failing to satisfy the written description requirement of 35 U.S.C. § 112 ¶ 1, are not invalid as indefinite under 35 U.S.C. § 112 ¶ 2, are not invalid under 35 U.S.C. § 102 for anticipation, and are not invalid under 35 U.S.C. § 103 for obviousness. The ID further finds that a domestic industry in the United States exists with respect to Tessera's Licensing Program, which has a nexus to the '326 and '419 patents as required by 19 U.S.C. § 1337(a)(2) and (3).

In his RD, the ALJ recommended that, should the Commission determine that a violation exists, a limited exclusion order would be properly directed to the accused chip packages that are manufactured by or on behalf of, or imported by or on behalf of, Respondents. Additionally, as Motorola is a named respondent, the ALJ recommended that any limited exclusion order should reach Motorola's downstream products that incorporate Respondents' infringing chip assemblies. The ALJ further recommended that, should the Commission determine that there has been a violation, a cease and desist order should issue against Respondents Motorola, Qualcomm, Freescale, and Spansion. Finally, the ALJ recommended that, should the Commission determine that there has been a violation, a bond be set in the amount of 3.5% the value of the imported accused products during the period of Presidential review.

On December 15, 2008, Tessera and the Commission investigative attorney ("IA") each filed a petition requesting review of the ID's finding that the accused products do not infringe the asserted patents. Also on December 15, 2008, Respondents filed various contingent petitions for review of the ID's findings should the Commission determine to review the subject ID. The contingent petitions requested review of the ID's findings concerning claim construction, direct infringement of the accused standalone products, and validity of the asserted claims.

On January 30, 2009, the Commission determined to review the final ID in part and requested briefing on several issues it determined to review, and on remedy, the public interest, and bonding. 74 *Fed. Reg.* 6175-6 (Feb. 5, 2009) ("Notice of Review"). The Commission determined to review: 1) the ALJ's finding that Respondents' accused devices do not infringe asserted claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and asserted claims 1-11, 14, 15, 19, and 22-24 of the '419 patent; 2) the ALJ's finding that Tessera has waived any argument that the accused products indirectly infringe the '419 patent; 3) the ALJ's finding that Motorola's invention of the 1989 68HC11 OMPAC chip ("OMPAC") does not anticipate the asserted patents under 35 U.S.C. § 102(b); and 4) the ALJ's finding that the Motorola's OMPAC invention does not anticipate the asserted patents under 35 U.S.C. § 102(g). *Id.* The Commission determined not to review the remaining issues decided in the ID. In its Notice of Review, the Commission asked the parties to address the following questions:

1. How the absence of the compliant layer affects the effective CTE of the baseline packages in the sense of the material properties of the structures remaining in the baseline. Specifically, to what extent does the CTE of the compliant layer materials affect the effective CTE of the accused packages as compared to their corresponding baseline packages? Also, how specifically do the substituted materials in the baseline packages affect the effective CTE of the baseline packages.

2. Whether Dr. Qu's plastic work analysis can be isolated to the validated range of the finite element analysis ("FEA") models, and if so, whether the validated results are sufficient to satisfy the preponderance of the evidence standard for infringement.

3. Whether Tessera may prove infringement by relying on multiple tests rather than one test. In his first test, Dr. Qu demonstrated the existence of terminal-to-chip displacement and its effect on improved reliability in the accused chips by comparing the on-board behavior of FEA models of the accused packages to the on-board behavior of FEA models of their corresponding baseline packages. In his second test, Dr. Qu showed that the accused chips exhibit improved reliability under external loads by directly applying simulated external

loads to the accused packages and their corresponding baseline packages. Was it sufficient that Dr. Qu showed the required features of the claimed "movement"– terminal-to-chip displacement and improved reliability under application of external loads – without directly showing terminal-to-chip displacement due to external loads?

4. Whether Motorola exercised reasonable diligence in reducing the OMPAC invention to practice by filing the applications leading to U.S. Patent Nos. 5,241,133 and 5,216,278, and whether the confidentiality agreement between Motorola and Citizen Watch amounted to "suppression" and/or "concealment" of the OMPAC invention.

On February 23, 2009, the parties filed written submissions regarding the issues on review, remedy, the public interest, and bonding. On March 5, 2009, the parties filed response submissions on the issues on review, remedy, the public interest, and bonding. On the same day, various interested parties filed response submissions concerning remedy, the public interest, and bonding. On March 26, 2009, the Commission requested additional briefing concerning Tessera's request for a "tailored" general exclusion order ("GEO") and invited briefing on the following questions:

1. Whether Tessera is entitled to a GEO under 19 U.S.C. § 1337(d)(2).

2. Whether the Commission has the authority under the statute to issue a "tailored GEO," which would ostensibly reach only specified downstream products and manufacturers while subjecting a complainant to the additional requirements of 19 U.S.C. § 1337(d)(2).

3. Whether the Commission has the authority to issue two different exclusion orders at two different times, specifically whether the Commission can issue a limited exclusion order ("LEO") immediately and then issue a GEO at a later date.

Id.

On April 10, 2009, Tessera, the IA, Respondents, and several interested parties filed initial written submissions in response to the Commission's request for additional briefing on remedy. On April 20, 2009, Tessera, the IA, Respondents, and one of the interested parties filed replies to these submissions. On April 29, 2009, after the Commission extended the deadline for filing

replies, the remaining interested parties submitted their reply briefs.

For the reasons discussed below, the Commission reverses the ID's determination of no violation of Section 337. Specifically, we reverse the ID's finding that Respondents' accused devices do not directly infringe asserted claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and asserted claims 1-11, 14, 15, 19, and 22-24 of the '419 patent. We also reverse the ID's finding that the issue of whether the accused chip packages indirectly infringe the asserted claims of the '419 patent has been waived. Moreover, we find that Respondents' have contributorily infringed the asserted claims of the '419 patent. The Commission also modifies the ID's analysis concerning its finding that the '326 and '419 patents are not invalid under 35 U.S.C. § 102(b) to clarify that the statute requires comparing the on-sale date of alleged prior art against the priority date of the asserted patents, not against the conception date of the asserted patents.

With respect to remedy, the Commission has determined to issue a limited exclusion order barring the entry into the United States of the accused chip assemblies of the named respondent chip manufacturers, as well as the downstream products of the named downstream manufacturer, Motorola, Inc., that incorporates the accused chip assemblies. The Commission denies Tessera's request for a "tailored" general exclusion order. The Commission has also determined to issue cease and desist orders against Motorola, Qualcomm, Freescale, and Spansion, and set a bond of 3.5% of the value of the imported accused products during the period of Presidential review.

Additionally, the Commission denies the motion by Siliconware Precision Industries Co., Ltd. and Siliconware U.S.A., Inc. to extend the date for reply submission's to the Commission's Notice of Review of the final initial determination and to compel the production of Complainant

Tessera, Inc.'s initial briefing in response to the Commission's Notice. We further deny respondents' Spansion, Inc. and Spansion, LLC's motion for a stay of the investigation in light of the commencement of bankruptcy proceedings involving them. The Commission also denies respondent Qualcomm's motion for leave to file a petition for reconsideration of the Commission's determination not to review the ID's finding that the asserted claims of the patents-in-suit are not indefinite. Finally, the Commission denies Respondents' motion to strike the Prowse Affidavit and the Cassidy Statement.

B. Patents at Issue

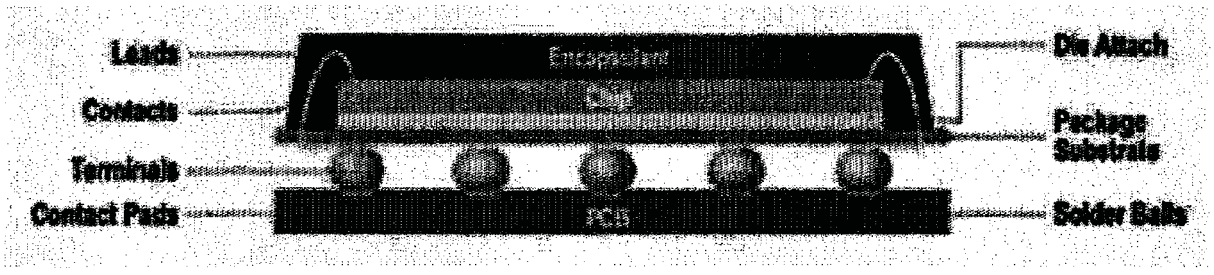
This investigation pertains to semiconductor chip assembly configurations, and specifically to semiconductor chips having ball grid array ("BGA") assemblies using solder balls to connect the semiconductor chip to a printed circuit board ("PCB") or printed wiring board ("PWB") where:

(i) the semiconductor chip is "face up," using wire bonds to connect the electrical contacts of the chip to the terminals on the package substrate;

(ii) the semiconductor chip substrate is made of a "laminate" material such as glass-reinforced BT or FR4; and

(iii) the "pitch" of the solder balls is relatively fine, permitting it to be a "small format" semiconductor chip.

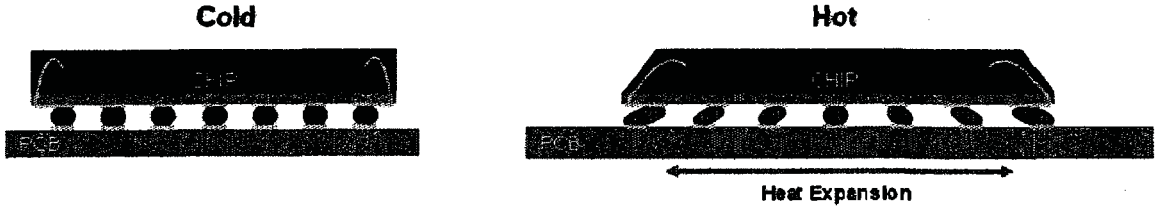
An example of a "face up" small format BGA chip package is illustrated below.



The figure above is a schematic of the cross-section of a BGA package. The rectangular shape in

the middle labeled "chip" is the semiconductor chip. The chip is connected to the bond wire – labeled "leads" – at the chip contact, labeled as "contact." The bond wire and the lead portion on the package substrate (a.k.a. "backing element") – labeled "package substrate – form the leads that connect the chip to the package substrate electrically. The package is connected to the PCB – labeled "PCB" – through the solder balls, shown as round-shaped masses in the figure and labeled as "solder balls." The solder balls connect terminals on the package substrate to the contact pads – labeled "contact pads" – on the PCB. The figure also shows a protective layer of encapsulant, which is labeled "encapsulant" and the die attach, which is labeled "die attach." The die attach is the layer located between the chip and the package substrate.

In particular, the asserted patents address certain problems due to stress caused by mismatches in coefficients of thermal expansion ("CTE") between the various materials, *e.g.*, the semiconductor chip, the package substrate, and/or the PCB, used in a semiconductor assembly. Semiconductor devices generate heat during operation and subsequently cool when operation ceases. Because the different materials have different CTEs, they expand and contract at different rates in response to temperature changes, leading to differential thermal expansion ("DTE") between the materials. Moreover, joining together multiple materials with different CTEs causes the CTE of the combination to be different from any single material. The repeated cycles of heating and cooling can place stress and strain on the electrical interconnections in a semiconductor assembly, particularly the solder balls, leading ultimately to breakage and electrical failure in the package.



The asserted patents disclose a new way to avoid the problem of stress and strain associated with DTE. By using structures that transfer at least some of the strain from the solder balls, or solder joints, into the semiconductor package itself, the asserted patents move strain from the outside of the package to the inside of the package, thereby improving reliability of the external connections. As an example, this can be accomplished by introducing a compliant layer between the chip and the backing element to allow the package terminals to move relative to the chip when the package is heated and cooled. By permitting this movement to occur, the inventive structures appreciably relieve the stresses that would otherwise be present in the solder balls as a result of DTE between the chip and the PCB. Thus, the asserted patents teach transferring the strain from second-level electrical interconnections outside of the package *(e.g.,* solder balls), into the package using particular structures that allow relative movement between the chip and the terminals.

The '326 patent is entitled "Face-Up Semiconductor Chip Assembly" and is directed to a semiconductor assembly having contacts on a peripheral region of the top surface of a chip and a backing element overlying the bottom surface of the chip, the backing element having terminals such that at least some of the terminals overlie the bottom surface of the chip. Leads, including bonding wires, extend alongside the edges of the chip and connect the contacts and the terminals. The terminals of the assembly are moveable with respect to the chip, thus providing relief from

stress and strain at the solder joints. The '326 patent has 29 claims, of which claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 are asserted against Respondents.

The '419 patent is entitled "Face-Up Semiconductor Chip Assembly" and explicitly incorporates the relationship between the assembly and a substrate such as a PCB. The '419 patent is directed to a semiconductor chip, which is mounted in a face-up disposition, with a contact-bearing front surface facing away from the substrate and with a rear face facing toward the substrate. A backing element having terminals is disposed between the rear face of the chip and the substrate, and the terminals of the backing element are connected to contact pads on the substrate. The terminals of the backing element are movable with respect to the chip to compensate for DTE of the chip and the substrate. The '419 patent has 29 claims, of which claims 1-11, 14, 15, 19, and 22-24 are asserted against Respondents.

C. Products at Issue

Tessera asserts that the accused products are at least the over 1,000 packages identified collectively by Respondents in response to Tessera's Interrogatory Requests No. 1 and No. 6, which asked Respondents to identify chip packages and products containing what Tessera termed a "Small Format Laminate BGA Package." *See* CPFF ¶¶ 130-31, 132-43. Tessera defined "Small Format Laminate BGA Package" to mean "a ball grid array chip package (a) wherein at least one semiconductor chip is in a face-up orientation, (b) having a laminate package substrate, (c) having a solder ball pitch of less than 1.27 millimeters, and (d) where at least one terminal or solder ball is beneath (*e.g.*, within the periphery of) a semiconductor chip in the package." Tessera's expert, Dr. Qu, testified, however, that his infringement analysis applied only to a subset of the packages

identified by Respondents. Specifically, Dr. Qu testified that the accused products must have at least 36 solder balls, a die attach modulus of 3.5 Giga Pascals ("GPa") or less, and not be flip-chip, package-in-package, or tape-based products. Dr. Qu, however, failed to provide an actual list of those packages that he opined infringe the asserted claims of the '326 and '419 patents.[1]

Tessera also accuses downstream products that incorporate the accused products. These accused downstream products include the following: 1) graphics processors made by or on behalf of ATI and incorporated into cellular phones; 2) baseband processors, multimedia application chips, and wireless network products made by or on behalf of Freescale and incorporated into cellular phones, wireless LAN devices, cable set-top boxes, portable data terminals, VOP telephone kits, and routers and switches; 3) baseband processors, Bluetooth transceivers, video receiver products, graphics processors, wireless network products, power management products, and radio frequency products made by or on behalf of Qualcomm and incorporated into cellular telephone handsets, Bluetooth headsets, wireless gateway devices and modem cards; 4) memory chips made by or on behalf of Spansion and incorporated into cellular telephones, digital cameras, handheld computers, video cameras, PDAs, video games, set-top boxes, and personal computers; 5) flash memory chips, level translators, RF ASICS, mixed signal ASICs and power management chips, data conversion chips, imaging signal processors, and digital and other ASIC products made by or on behalf of ST-NV and incorporated into cellular telephone handsets, other wireless

[1] Respondents argue that Tessera included two package-in-package and flip chip packages – Qualcomm's MSM7200 and MSM7200A packages – in its list of accused products. Respondents Joint Contingent Pet. at 22. Since Tessera explicitly excludes these types of products from the universe of accused products, to the extent that these products are flip-chip or package-in-package,

handsets, handheld computers, data terminals, and hand-held or stationary data-scanning devices, satellite receivers, hard disk drives, routers/switches and set-top boxes; and 6) cellular telephone handsets, set-top boxes, handheld data scanners, and mobile computers imported by or on behalf of Motorola that incorporate unlicensed infringing products.

II. INFRINGEMENT

A. Direct Infringement

A determination of infringement is a two-step analysis. "First, the court determines the scope and meaning of the patent claims asserted." *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998) (*en banc*) (citations omitted). "[Second,] the properly construed claims are compared to the allegedly infringing device." *Id.* "To prove direct infringement, the plaintiff must establish by a preponderance of the evidence that one or more claims of the patent read on the accused device literally or under the doctrine of equivalents." *Cross Medical Products, Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1310 (Fed. Cir. 2005).

The Commission determined to review the ID's finding that Respondents' accused devices do not infringe asserted claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent and asserted claims 1-11, 14, 15, 19, and 22-24 of the '419 patent. Specifically, the Commission determined to review the ALJ's assessment of the testing methodology of Tessera's expert, Dr. Qu, as well as his conclusions concerning direct infringement. Claim 1 of the '326 patent and claim 1 of the '419 patent are representative of the asserted claims and are set forth below with an emphasis on the limitation at issue:

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we exclude the Qualcomm MSM7200 and MSM7200A packages from the investigation.

'326 patent:

1. A semiconductor assembly comprising:

a semiconductor chip having oppositely facing front and rear surfaces and edges extending between said front and rear surfaces, said chip further having contacts on a peripheral region of said front surface;

a backing element having electrically conductive terminals and lead portions thereon, wherein said lead portions are connected to said terminals, said backing element overlying said rear surface of said semiconductor chip such that at least some of said terminals overlie said rear surface of said chip;

bonding wires connected to said contacts on said front surface of said chip, said bonding wires extending downwardly alongside said edges of said chip and being connected to the lead portions on the backing element;

wherein said terminals are movable with respect to said chip.

'419 patent:

1. A semiconductor assembly comprising:

a) a semiconductor chip having a front surface, a rear surface and contacts on said front surface, said semiconductor chip having a coefficient of thermal expansion;

b) a substrate adapted to physically support the chip and electrically interconnect the chip with other elements of a circuit, said substrate having a set of contact pads thereon, said substrate having a coefficient of thermal expansion, said semiconductor chip overlying said substrate so that said chip overlies at least some of said contact pads of said set and so that said rear surface of said chip faces toward said substrate and said contact pads;

c) a backing element having electrically conductive terminals and electrically conductive lead portions electrically connected to said terminals and to said contacts on said chip, said backing element having a central region aligned with said chip and disposed between said rear surface of said chip and said substrate, said terminals of said backing element being bonded to said contact pads on said substrate, at least some of said terminals of said backing element being disposed in said central region of said backing element ***and being movable with respect to the chip to compensate for differential thermal expansion of the chip and substrate.***

The ID finds that the most contentious aspect of Tessera's infringement allegations revolves around the limitation in claim 1 of the '326 patent and its dependent claims requiring that "[the] terminals are *movable* with respect to [the] chip."[2] ID at 57 (emphasis added); *see* '326 patent, 34:35-36. Likewise, the asserted claims of the '419 patent include limitations requiring a "terminal being *moveable* with respect to the chip to compensate for [DTE] of the chip and substrate" and "*movement* of said terminals to compensate for [DTE] of the chip and substrate." ID at 68 (emphasis added).

The ID collectively construes the limitations in both asserted patents concerning "terminals" that are "*moveable*" and "*movement* of said terminals" to require that "in the operation of the assembly, the terminals are capable of being displaced relative to the chip by *external loads* applied to the terminals, to the extent that the displacement appreciably relieves mechanical stresses, such as those caused by DTE which would be present in the electrical connections absent such displacement." ID at 57-58. The ALJ noted that, during prosecution of the asserted patents, Tessera disavowed solder deformation and CTE matching as the claimed movement, and thus limited the claims to terminal movement due to external loads – force exerted by the PCB on the solder balls when the chip package is on-board – as opposed to any terminal movement that might be caused by internal loads, which is displacement of the terminals due solely to the CTE expansion/shrinkage of the package. ID at 49. Therefore, the ID finds that, in order to prove that the claimed "movement" is present in the representative accused product, Tessera must show that:

[2] The parties do not contend that any other limitations of the asserted patents are not met by the accused chip packages.

(1) the terminals are capable of being displaced with respect to the chip by external loads and (2) the displacement caused by the external loads appreciably relieves mechanical stresses. ID at 58.

The ALJ found several problems with the methodology that Dr. Qu used to show that the accused products have the claimed movement, *i.e.*, that Dr. Qu did not use a proper hypothetical baseline package as a comparison with the accused packages, that Dr. Qu did not appropriately validate his finite element analysis ("FEA") models, and that neither of his two testing methodologies – comparison of the terminal-to-chip displacement during thermal cycling of the on-board FEA models of the representative accused packages to their corresponding baseline packages, and off-board/on-board comparison analysis of the representative accused packages to estimate the terminal-to-chip displacement due to external loads – were successful in proving that the accused packages have the claimed movement. For the reasons discussed below, the Commission finds that Dr. Qu's methodology in creating baseline packages was correct, that his FEA modeling was properly validated using moiré testing, and that his off-board/on-board comparison analysis shows that the accused products infringe the asserted claims of the '326 and '419 patents. We also find, however, that Dr. Qu's comparison of the terminal-to-chip displacement during thermal cycling of his on-board FEA model of the accused package of each representative accused product with the terminal-to-chip displacement during thermal cycling of its corresponding baseline package does not show infringement.

1. Baseline packages

The ALJ, in finding that Tessera had not successfully proved infringement, rejected the hypothetical baseline packages that Dr. Qu compared to accused packages in analyzing whether the

accused packages practiced the claimed "movement." Dr. Qu testified that it was necessary to create a baseline package for each of the accused packages modeled in order to isolate the claimed movement, *i.e.*, the terminal-to-chip displacement due to external loads that appreciably relieves mechanical stress in the electrical connections, from other types of movement that may be present in the chip assembly. ID at 59. To create his baseline packages, Dr. Qu testified that he replaced the values for the compliant die attach material of the accused packages with values for silicon in his FEA models. ID at 59. He also testified that he replaced the values for the solder mask material of the accused packages with the values for package substrate core material. *Id.*

The ALJ noted that both silicon and the package substrate core material – BT resin – are much stiffer than die attach or solder mask. ID at 60, fn. 18. Because the values for silicon and package substrate replaced the die attach and solder mask used in the accused packages, the ALJ found that the CTE of the baseline packages overall would be different than that of its corresponding accused package. ID at 60. The ALJ also found that the compliant layers in the accused packages (*i.e.*, the compliant die attach material and compliant solder mask material) act to decouple the chip from the package substrate, thereby allowing the package substrate to move more than it would if it were bound to the chip and allowing the CTE of the package substrate to more closely match that of the PCB, thereby improving reliability. *Id.* The ALJ concluded that, by replacing the compliant layers in the accused packages with much stiffer materials in the baseline packages, Dr. Qu made each baseline artificially stiff, thereby guaranteeing that the baseline models would show less terminal-to-chip displacement under application of the same load than that of its corresponding accused package. *Id.*

The ALJ also concluded that, because Dr. Qu had no way to quantify how much the CTE of a baseline package had changed compared to its corresponding accused package, Dr. Qu could not determine to what extent any improvement in reliability in an accused package over its baseline package was due to the claimed "movement" as opposed to the change in the physical properties of the chip package (*i.e.*, the CTE of the baseline). ID at 61.

The Commission finds that Dr. Qu correctly followed the uncontested claim construction of the "movement" limitation when he used a baseline to create a situation where there would be an "absence" of the claimed "movement." The claim construction specifically suggests that "absent such displacement" – such displacement being displacement of the terminal relative to the chip by external loads applied to the terminals – there would be appreciably more mechanical stress in the electrical connections caused by DTE. Dr. Qu specifically determined that the compliant layer used in the baseline packages should be rigid (not compliant) so as to minimize the relative displacement between the chip and the terminal. *See* RX-260 (Qu, Expert Report) IX-46, ¶113.

We agree with Dr. Qu's approach. If the observed improvement in reliability of the solder joint is greater in the presence of a compliant layer as compared to when it is absent, then the logical conclusion is that the presence of the compliant layer "appreciably relieves mechanical stresses." Furthermore, if terminal-to-chip displacement is minimized in the baseline because of the absence of the compliant layer, then the presence of the compliant layer must facilitate terminal-to-chip movement, which in turn, minimizes the stress in the solder balls, thus satisfying the "moveable" limitation. The only additional analysis that is required is whether that

terminal-to-chip displacement is due to external loads as opposed to internal loads. There is no inherent error in creating a more rigid baseline that would necessarily lead to a decrease in terminal-to-chip displacement and a resultant decrease in reliability in the solder joints.

The ALJ found that the overall CTE of the baseline package would be different than that of its corresponding accused package because different materials were substituted for the compliant layer in the baseline packages. ID at 60. We recognize that there is a potential difficulty created by the difference in the effective CTEs of the accused packages and their corresponding baseline packages. Specifically, if the effective CTE of an accused package is different than its baseline package, any analysis of the differences in observed terminal-to-chip displacement between the two packages would take on added complexity. Not only would one need to determine how much the difference in the observed displacement was due to only external loads, but one would also need to account for how much of the observed displacement is due to the internal loads caused by the differences in the CTEs of the two packages. While terminal-to-chip displacement due to external loads is the claimed invention, terminal-to-chip displacement from internal loads was disclaimed by Tessera, and is, therefore, not part of the claimed invention. The question, therefore, is just how significant to the analysis is the difference in the effective CTEs of the accused and baseline packages. Because the ID did not address this issue, we asked the parties to provide further elaboration.

The Commission finds that none of the parties adequately overcame the ALJ's reservations concerning the difference in the effective CTEs of the baseline packages and their corresponding accused packages. Dr. Qu admitted that the effective CTE of the baseline packages is changed by

substituting silicon for the die attach layer and package substrate core material for the silicon mask layer. Hearing Tr. (Qu), 447:23 – 448:2. Dr. Qu failed, however, to quantify the significance of that change for his infringement analysis. Tessera's argument that, because of the complexity in assessing the CTE effect of any specific material, the effect of the additional silicon and package substrate material on the baseline packages cannot be known, is likewise unhelpful. Simply because the answer is difficult to know does not mean that Tessera is excused from making the required showing on the issue. *Cross Medical*, 424 F.3d at 1310 ("To prove direct infringement, the plaintiff must establish by a preponderance of the evidence that one or more claims of the patent read on the accused device literally or under the doctrine of equivalents.").

Respondents are similarly vague in their responses. They all state that increasing the amount of silicon in the baseline packages causes a significant impact on the effective CTE of the baseline package that renders any comparison with the accused packages meaningless. The only support cited to for this proposition, however, is a conclusory statement by Respondents' expert, Dr. Sitaraman, that "[i]ncreasing silicon content interferes with the CTE matching within the package, thus generating additional internal movement of the terminal relative to the chip." RX-3179C (Sitaraman W.S.) Q. 297. Dr. Sitaraman fails, however, to elaborate on how significant such interference might be.

Dr. Sitaraman's experiment comparing Motorola's OMPAC chip to a baseline likewise fails to provide any evidence concerning the significance of the change in the effective CTE of the baseline packages. In this experiment, Dr. Sitaraman created a baseline of the OMPAC chip according to Dr. Qu's methodology by replacing the solder mask with package substrate material

and the die attach with silicon. Respondents claim that because the OMPAC chip demonstrated greater terminal-to-chip displacement compared to the baseline package, Dr. Qu's baseline methodology showed that the OMPAC chip had the claimed "movement." Respondents argue that, because of the substitutions of materials, the new OMPAC baseline no longer had an effective CTE that was sufficiently matched to the PCB, and therefore, showed greater solder ball stress than the original OMPAC package. Respondents claim that the results of Dr. Sitaraman's experiment demonstrate the materiality of the effective CTE error resulting from Dr. Qu's methodology in creating his baseline packages.

As the ALJ found, the OMPAC uses CTE matching to relieve mechanical stress and improve chip package reliability. ID at 84-85. No party contends that CTE matching is not effective in providing some stress relief in the electrical connections of a chip package. At most, Dr. Sitaraman's experiment shows that the baseline packages restrict terminal-to-chip displacement, including terminal-to-chip displacement due to CTE matching. The experiment does not demonstrate, however, what significance the increase in silicon and package substrate material has on the CTE of the baseline packages.

The record, therefore, provides no evidence concerning the significance of the thicker silicon and package substrate layers on the effective CTE of the baseline. As such, the ALJ's doubts concerning the effectiveness of the baseline packages in proving that the accused packages practice the "movement" limitation remain unassuaged. The CTE behavior of the baseline package, however, only affects its usefulness in Dr. Qu's comparison of the terminal-to-chip displacement during thermal cycling of his on-board FEA model of the accused package of each

representative accused product with the terminal-to-chip displacement during thermal cycling of its corresponding baseline package. As discussed below, although this comparison fails to demonstrate that the accused packages satisfy the "movement" limitation, we find that Dr. Qu's off-board/on-board comparison analysis succeeds in making such a showing, as this analysis does not depend on the CTE behavior of the baseline packages.

2. FEA Modeling and Moiré Validation

Dr. Qu used FEA models to analyze the behavior of the accused packages and their corresponding baseline packages. ID at 58-59. The ALJ noted that FEA modeling is a general and well-accepted procedure for conducting simulations using digital computers to simulate the behavior of structures such as electronic packages. ID at 58, fn. 16. In order to validate his FEA models, Dr. Qu performed moiré testing on several of the representative packages. ID at 66. Moiré testing is an experimental technique used for validating a finite element model in which a grating with very fine lines is epoxied to an actual sample. ID at 66-67. Using laser beams, optical measurements are then made on that sample at different temperatures to measure the displacements at various points on the package. ID at 67.

The ALJ found that Dr. Qu did not properly validate his FEA models because (1) the moiré testing was incapable of distinguishing claimed "movement" from movement due to internal forces (*i.e.*, CTE expansion) and (2) Dr. Qu performed the moiré analysis over a range of +25 to +75 degrees Celsius, rather than over the full temperature range of -25 to +125 degrees Celsius that he modeled using FEA. ID at 67. The ALJ did, however, indicate that "the moiré testing may have produced similar results to that seen in Dr. Qu's FEA models" over the temperature range of the

moiré test. *Id.*

Although the ALJ found that Dr. Qu's FEA models were not validated because the moiré testing was incapable of distinguishing between the claimed "movement" and terminal-to-chip displacement due to internal forces, it is clear from the evidence that the purpose of the moiré testing was simply to validate the results of Dr. Qu's FEA modeling. CX-3196C (Qu W.S.) Q. 237. There is no evidence that Dr. Qu performed moiré testing in an independent attempt to show infringement. Thus, the fact that all of Dr. Qu's FEA results were not validated by the moiré testing is not determinative of the infringement issue.

The ALJ's second finding, concerning whether the moiré tests did, in fact, validate Dr. Qu's FEA modeling, is relevant. The ALJ did find that Dr. Qu's "moiré testing may have produced similar results to that seen in Dr. Qu's FEA models." ID at 67. Since the ALJ made no other findings regarding the degree of agreement between the FEA models and the moiré results, we take the statement to mean that the ALJ found sufficient agreement between the FEA models and the moiré results over the temperature range in which moiré testing was conducted. In its Notice of Review, the Commission asked whether Dr. Qu's package reliability analysis, as determined by his plastic work analysis[3], can be isolated to the validated range of the FEA models, and if so, whether the validated results are sufficient to satisfy the preponderance of the evidence standard for infringement. [

] Therefore, the question remains whether Dr. Qu's validation of his FEA

[3] "Plastic work" is a product of the stress and the plastic strain on the solder ball, which is fundamentally a measure of the amount of permanent damage done to the solder ball when it is

modeling over the temperature range covered by his moiré testing means that his FEA modeling was validated over the broader temperature range used in the FEA modeling.

Respondents' expert, Dr. Sitaraman, testified that when the material properties[4] used as inputs to the FEA model are correct, the FEA model is generally correct. RX-3179C (Sitaraman W.S.) Q. 463 ("First, it is not necessary to do moiré on every type of package that one simulates. ... In addition, the structure and material properties for the 1989 OMPAC 68 package are very well documented, and therefore, the model for it is accurate. So it is very reasonable to conclude that the [FEA] modeling correctly captures the behavior of the modeled packages....")

Dr. Qu testified that he used documentation provided by Respondents to obtain the geometric dimensions of the Respondents' products in order to model them. CX-3196C (Qu W.S.) Q. 177. Dr. Qu further testified that he determined the properties of the materials within the package from Respondents' documents, third party documents, or open literature. *Id.* Q. 184. [

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The ALJ did not criticize Dr. Qu's modeling data inputs, but rather the fact that his moiré

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strained. *See*, IA Pet. at 14.

[4] The material properties that are input into an FEA model include the physical dimension and structure of the chip and the properties of the materials constituting the chip, *e.g.*, modulus of elasticity and CTE. CX-3196C (Qu W.S.) QQ. 152-154, 163-165.

testing did not span the FEA temperature range. The ALJ recognized the inherent validity of FEA modeling, though he mistook the purpose for which Dr. Qu used the tool, stating: "So even though FEA modeling is a valid method to examine material products, it will not necessarily produce a result that is valid in this hearing; [i]f the claimed "movement" is not isolated, or quantified, we may be unable to reach a conclusion based on the modeling. ID at 59, fn. 16 (emphasis added). The ALJ never addressed Dr. Sitaraman's own statement that, where the data inputs to the FEA model are correct, the results will be correct. RX-3179C (Sitaraman W.S.) Q. 463. The ALJ made no finding that Dr. Qu used incorrect data in creating his FEA models. It is, therefore, inconsistent for him to conclude, given the evidence of record, that the same data that was validated over one range somehow becomes invalid over a broader range.

Respondents argue that certain material parameters used in constructing the FEA models, such as CTE and glass transition[5], are drastically different outside of the narrower temperature range of Dr. Qu's moiré testing, and that the evidence fails to establish how well the FEA models predicted (or failed to predict) accused package behavior where significant changes in material properties occurred outside of the moiré range. Tessera acknowledges that the majority of materials that Dr. Qu modeled had properties that changed with temperature. Tessera asserts, however, that Dr. Qu used temperature dependent parameters for his modeling inputs in order to ensure accurate results:

[5] The glass transition temperature is the threshold temperature above which the modulus (rigidity) for polymeric materials decreases dramatically, such that a material may have a relatively high modulus at room temperature, but has a much lower modulus above the glass transition temperature. *See* CX-3196C (Qu, W.S.) at ¶ 74.

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Respondent Qualcomm states that "agreement between the results of the moiré half model and the physical sampling testing only validate the general modeling approach, not necessarily the results of the full model and the related opinions." Neither Qualcomm nor the other Respondents point to any support for the proposition that the "preponderance of the evidence" standard requires direct validation of every result of the FEA modeling beyond a general validation of the modeling method and inputs to the model. In fact, Respondents' expert, Dr. Sitaraman, states that precisely the opposite is the case. *See* RX-3179C (Sitaraman W.S.) Q. 163 ("Provided that one uses the

same methodology in modeling a number of packages, experimental moiré testing can be done on several test samples. If the moiré testing agrees with the moiré simulations for those test samples, that agreement would validate the overall modeling methodology common to the other packages.").

Respondents point to two cases to support their claim that Dr. Qu failed to properly validate his FEA model. They cite *Novartis Corp. v. Ben Venue Labs., Inc.*, for the proposition that "every simulation of a physical process embodies at least some simplifying assumptions, and requires both a solid theoretical foundation and realistic input parameters to yield meaningful results." 271 F.3d 1043, 1054 (Fed. Cir. 2001). In *Novartis Corp.*, the patentee's expert created a computer model to represent the accused process. The court rejected the model, finding that there was no evidence in the record explaining the basis for the expert's model. *Id.* at 1049. Furthermore, the court found that the expert's model was unrelated to any reaction at issue for the accused process. *Id.* at 1054.

In this case, Dr. Qu used a modeling technique that the ALJ recognized was well accepted and used throughout the industry. ID at 58, fn. 16. Dr. Qu did not create the FEA modeling tool for use in this investigation. As for the purpose of the models, Dr. Qu used his FEA models to analyze the deformation behavior in the accused products and their corresponding baseline packages. RX-260C (Qu Expert Report) at XII-1 – XII-24. Therefore, there is no serious question that there was a "solid theoretical foundation" for Dr. Qu's FEA modeling, and as discussed previously, there is no evidence that he did not use "realistic input parameters."

Respondents also point to *Alza Corp. v. Mylan Labs., Inc.*, for the proposition that, as a proponent of the model, Tessera is required to prove that it is a valid model and that the modeling

work was properly done. 464 F.3d 1286, 1295-1297 (Fed. Cir. 2006). In *Alza*, the patentee used models to provide evidence that the accused generic formulation of a drug exhibited an *in vivo* release profile falling within the claimed ranges at the relevant times. 464 F.3d at 1295. The court rejected the models, finding that "[t]he critical deficiency in the evidence presented by [the patentee] was ... that it failed to credibly link these pieces of evidence with the relevant pharmacokinetic parameter – the rate of *in vivo* dissolution in the GI tract." *Id.* at 1296. The district court had found that the patentee failed to demonstrate how the evidence that was sought could be extracted from the data determined from the models. *Id.* Furthermore, the patentee's expert admitted that his model was not designed to reflect the *in vivo* processes. *Id.*

Such is not the case here. Dr. Qu did not produce data using his FEA modeling that had no connection to the real world situation he was attempting to simulate. His FEA models were designed to simulate the behavior of the accused and baseline packages using well-accepted industry tools. The only data the models were meant to simulate were package deformation, specifically, terminal-to-chip displacements, data which was presented directly with no need for the ALJ to extract the data from abstract results.

Respondents also argue that Dr. Qu's moiré results did not validate his FEA modeling because of the discrepancy between the terminal displacement obtained from the moiré analysis and the terminal displacement measured using the FEA models. Respondents' expert, Dr. Sitaraman testified, however, that "in practice, there is always some disagreement, and the person doing the calculations must apply engineering judgment to determine whether the agreement is sufficient given the purpose of the calculation to be validated." RX-3179C (Sitaraman W.S.) Q.

315. Dr. Sitaraman also stated that the discrepancy between the FEA models and the moiré results can be expected to increase over the broader temperature range used in Dr. Qu's FEA analysis, but he offered no evidence to back up his opinion.

Respondents fail to appreciate the purpose for which Dr. Qu performed his FEA analysis. As discussed previously, Dr. Qu used his FEA models to analyze the deformation behavior in the accused products and their corresponding baseline packages. RX-260C (Qu Expert Report) at XII-1 – XII-24. Dr. Qu used the results of his FEA modeling of the accused and baseline packages to determine the terminal-to-chip displacement and to calculate the plastic work for those packages. *Id.* at XII-87-108. Dr. Qu testified that deformation is related to strain. *Id.* at 104. Therefore, any underestimation in calculating deformation of the package would logically lead to an underestimation of the calculated plastic work due to strain. Likewise, any underestimation of the terminal-to-chip displacement that might relieve such strain would lead to an underestimation of the calculation of the amount of strain actually relieved. As such, the admittedly conservative results of Dr. Qu's FEA models as compared to his moiré analysis supports the conclusion that the accused packages would demonstrate even greater reliability improvement over the baselines than he calculated from the FEA models. *See* CX-3196C at Q. 239. By asserting that the results of the moiré analysis and the FEA model must agree, regardless of whether the results of the FEA model are conservative, Respondents both overstate what Tessera was required to prove and confuse the purpose for which the FEA modeling was offered.

Finally, we disagree with Respondents that the evidence shows that validation of Dr. Qu's FEA modeling was necessary. There is no evidence in the record to suggest that moiré validation

must always be performed. The only so-called evidence Respondents cite simply states that moiré analysis is used to validate FEA, not that FEA must be validated:

> Q. Why did you use Moiré analysis in studying the accused products?
> A. The primary purpose of using Moiré was to validate the finite element modeling.

CX-3196C (Qu W.S.) Q. 237. As is clear from Dr. Qu's testimony, while he did use moiré analysis to validate his FEA modeling, he never intimated that such validation was necessary. Likewise, Dr. Sitaraman testifies as to the usefulness of moiré analysis as a validation technique without stating that such validation is necessary. RX-3179C (Sitaraman W.S.) Q. 162. Regardless of whether validation is necessary, since Tessera introduced evidence of validation into evidence, the ultimate question is whether Dr. Qu's moiré results validated his FEA modeling. The Commission finds that his FEA modeling was properly validated for the purpose for which it was offered: to analyze the deformation behavior and terminal-to-chip displacement in the accused and baseline packages. The Commission finds, therefore, that the moiré testing that Dr. Qu performed over a range of +25 to +75 degrees Celsius validated his FEA modeling methodology over the broader temperature range of -25 to +125 degrees Celsius.

3. Dr. Qu's Two Testing Methods

The ID correctly finds that, to prove that the claimed "movement" is present in the representative accused products, Tessera must show that: (1) the terminals are capable of being displaced with respect to the chip by external loads; and (2) the displacement caused by the external loads appreciably relieves mechanical stress. ID at 58. Dr. Qu used two different methods in his attempt to show that the accused packages meet this test. In the first method, Dr. Qu

compared the terminal-to-chip displacement during thermal cycling of his on-board FEA model of a package of each representative accused product with the terminal-to-chip displacement during thermal cycling of its corresponding baseline package and then calculated the resulting plastic work for each of the accused and corresponding baseline packages. ID at 58-59. Dr. Qu's second testing method involved comparing the off-board and on-board behavior of each of the representative accused packages during thermal cycling to estimate the amount of displacement due to external forces, and then directly applying the estimated external load displacement to the accused packages and their corresponding baseline packages to calculate the resulting plastic work for each of the accused and corresponding baseline packages. ID at 62.

With respect to Dr. Qu's first testing method, the ALJ found that the baseline packages were artificially stiff because they had much stiffer materials in the compliant layers than their corresponding accused packages. ID at 60. The ALJ compared Dr. Qu's baseline packages to the accused packages, finding that the compliant layers in the accused packages (*i.e.*, the compliant die attach material and compliant solder mask material) act to decouple the chip from the package substrate, allowing the package substrate to move more than it would if it were bound to the chip, and thus allowing the CTE of the package substrate to more closely match that of the PCB, thereby improving reliability. *Id.* As such, the ALJ found that the artificially stiff baseline packages would not only prevent the claimed movement, but also prevent, at least in part, the ability of the package substrate to move according to its CTE. ID at 61. Thus, the ALJ found that, because Dr. Qu had no way to quantify the amount of claimed "movement" in the baseline models or how much the CTE of the chip package had changed in the baseline models, Dr. Qu could not determine from his

plastic work calculations what portion of the improved reliability in the accused packages is due to the "claimed movement" and what portion is due to the change in the physical properties of the baseline chip package (*i.e.*, the CTE of the baseline). *Id.*

Regarding Dr. Qu's second testing method, Dr. Qu testified that in order to estimate the amount of displacement due to external forces, he had to assume that all of the materials in the system behave in a linear way. ID at 62. The ALJ found that, because Dr. Qu never quantified the margin of error inherent in his "linearity assumption," the assumption was improper. *Id.* The ALJ also found that Dr. Qu's second testing method could not sufficiently determine the terminal displacement due to external loads because it did not measure the displacement at the terminal as required by the claim construction, but rather measured the displacement at the bottom of the solder balls. ID at 63. Furthermore, the ALJ found that, because Dr. Qu generally observed greater terminal-to-chip displacement when the packages were off-board rather than on board, Dr. Qu's methodology could not show that any observed displacement is actually due to external loads and not due to CTE matching. ID at 64. Thus, the ALJ stated that "without determining how much of the total movement is due to CTE matching, Dr. Qu's computation of the improved life cycle of the package due to 'claimed movement is flawed and cannot demonstrate that Tessera's invention is providing any appreciable increase in reliability." *Id.* Therefore, the ALJ found that Tessera failed to make the necessary showing that the magnitude of the claimed movement, if present, is great enough to appreciably relieve stress due to external loads. ID at 64-65.

In construing the "movement" limitation, the ID finds that, in the prosecution history, Tessera disclaimed solder deformation and CTE matching as the claimed movement, and limited

the asserted claims to terminal-to-chip displacement due to external loads. ID at 49. The ALJ criticized Dr. Qu's testing methods for failing to distinguish terminal-to-chip displacement due to external loads from terminal-to-chip displacement due to "internal loads." ID at 65. It is important, therefore, to clarify precisely what is meant by "internal loads." The ALJ stated several times that Dr. Qu failed to determine how much of the observed terminal-to-chip displacement is due to the "physical properties of the chip package," "the CTE of the package substrate," and "CTE matching." ID at 61, 63, and 64. Although the ALJ used different terminology at some points, it is clear that he found that the disclaimed "movement" is any terminal-to-chip displacement due solely to CTE matching that might relieve stress in the electrical connections. Therefore, his use of "internal loads" in the context of the claimed "movement" and the related infringement analysis refers to the disclaimed CTE matching and not any other type of internal motion that might be present within the chip package.

The parties apparently disagree as to precisely what is meant by "CTE matching." The ALJ gleaned the proper meaning of this term from the prosecution history in which Tessera disclaimed that method:

> "Indeed, Lin's teaching that one should rely upon deformable solder balls and CTE matching of the 'carrier substrate 12' and the printed circuit board as a full and adequate solution to the problem of solder joint fatigue leads away from any suggestion that one should provide terminals movable relative to the chip to deal with this problem."

ID at 48 (emphasis added), *citing to* JX-3, Amendment 8/20/02 at 4-5. In numerous places in the ID, the ALJ clearly states that CTE matching is between the package substrate and the printed circuit board. *See* ID at 60-66. The ALJ is completely consistent in defining "CTE matching" as

matching the CTE of the package substrate, as opposed to the package overall, to the CTE of the PCB. Respondents never challenge that definition and we believe it to be correct.

1) First Testing Method

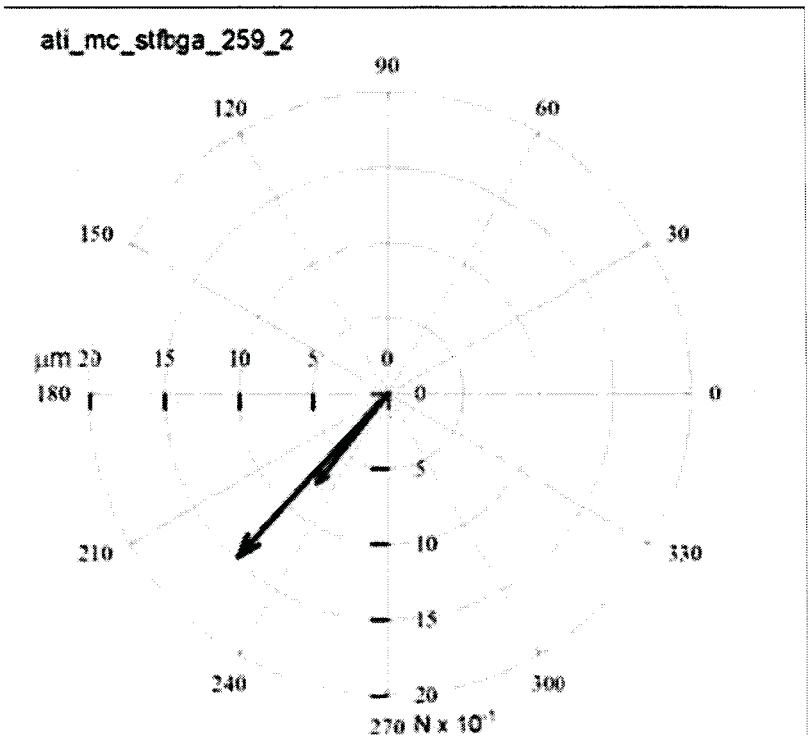
Turning to the ID's analysis of Dr. Qu's two testing methods, the Commission affirms the ALJ's finding that Dr. Qu's first testing method failed to demonstrate infringement. Specifically, the ALJ was correct in finding that Dr. Qu's first testing method failed to demonstrate that the accused packages meet the claimed "movement" limitation because the method did not sufficiently demonstrate that the greater terminal-to-chip displacement and associated increase in solder joint reliability that Dr. Qu calculated in the accused packages was due to external loads as opposed to CTE matching. ID at 61. We agree that Dr. Qu's analysis failed to isolate the terminal-to-chip displacement, and therefore could not prove that the improvement in reliability was due solely to external loads. Since Tessera disclaimed CTE matching from the claimed "movement," it needed to account for terminal-to-chip displacement due to external loads versus displacement due to internal loads.

We disagree with Respondents, however, that the construction of the "movement" limitation requires a quantification of the terminal-to-chip displacement. The undisputed claim construction of the "movement" limitation requires only that Tessera show that: (1) the terminals are capable of being displaced with respect to the chip by external loads; and (2) the displacement caused by the external loads appreciably relieves mechanical stress. ID at 58. There is nothing within that two pronged test that requires quantifying the amount of terminal-to-chip displacement. All that is required is that Tessera establish the existence of terminal-to-chip displacement due

solely to external loads as opposed to CTE matching, and that such displacement appreciably relieves mechanical stress. Therefore, we find that Dr. Qu was correct in focusing his attention on the percentage of reliability improvement in the accused packages over their corresponding baseline packages rather than attempting to quantify the terminal-to-chip displacement in the accused packages.

In an effort to directly demonstrate that the observed terminal-to-chip displacement in his first testing method was due to external loads, Dr. Qu created graphic displays in the form of polar plots, which were designed to show, for each package, the direction and magnitude of 1) the displacement of the critical terminal and 2) the load applied by the PCB (*i.e.*, the ***external*** load) to the solder ball attached to that critical terminal.[6] In its petition for review, Tessera argued that the ALJ erred in failing to consider Dr. Qu's polar plots. In the following example of one of the polar plots, the blue arrow is the external force applied to the terminal and the red arrow is the direction the terminal is displaced:

[6] The "critical terminal" is the terminal to which the "critical solder ball," *i.e.*, the solder ball that experiences the most strain and therefore breaks first, is attached. Tessera Pet. at 64, fn. 20.



CX-3196C (Qu W.S.) Q. 271.

The fact that the ALJ did not discuss the polar plots does not affect our conclusion that Dr. Qu's first method fails to demonstrate infringement. The polar plots do not convincingly demonstrate that the terminal displacement is due solely, or even significantly, to the external force. Dr. Qu even admitted that his polar plots do not show what portion of the terminal displacement is due to the external force:

> Q. Did you show the portion of the displacement due to external force?
>
> A. No. You don't need to do so in order to apply the patent claims, I only need to show that there is displacement due to external force and that the displacement appreciably relieves stresses on the electrical connections.

CX-3196C (Qu W.S.) Q. 272. At the hearing, Dr. Qu further testified that, because the vectors shown in the two-dimensional polar plots are, in reality, three-dimensional vectors, the vectors

could actually be pointing in two different directions (*e.g.*, one pointing upward and the other pointing downward), even though they appear to point in the same direction in the "flat" polar plots. Hearing Tr. (Qu), 479:5-21.

As a point of comparison, Respondents' expert, Dr. Sitaraman, created polar plots based on FEA modeling of one of the accused packages both on-board and off-board and compared the displacement of the critical terminal in each situation. RX-3179C (Sitaraman W.S.) Q. 321. Dr. Sitaraman's results showed that the direction and magnitude of the terminal movement vector is essentially the same in both the on-board and off-board situations, meaning that there is no way to conclude from Dr. Qu's plots that the terminal displacement is due to external rather than internal forces. *Id.* at Q. 323-324. We find Dr. Sitaraman's analysis to be persuasive, and as such, the ALJ did not err by not discussing Dr. Qu's polar plots.

2) Second Testing Method

To perform his off-board/on-board comparison analysis, Dr. Qu compared the off-board and on-board behavior of the representative accused packages during thermal cycling to estimate the amount of displacement that was due to external forces. ID at 62. Dr. Qu's estimates were based on what he called the "linearity assumption," under which the displacement of the terminals in a package due to external loads should be the difference between the displacement of the terminals when the package is on a PCB, and thus subject to both internal and external loads, and the displacement of the terminals when the package is off the PCB, and thus subject only to internal loads. CX-3196C (Qu W.S.) Q. 285. Using his "linearity assumption," Dr. Qu sought to determine an approximation of the external loads applied to the terminal, which he stated was

equivalent to the load applied to the bottom of the solder balls. RX-260C (Qu, Expert Report) XIII-2, ¶6. First, Dr. Qu created FEA models of each representative accused package on-board, and computed the displacement of each point "x" at the bottom of each solder ball as a function of temperature:

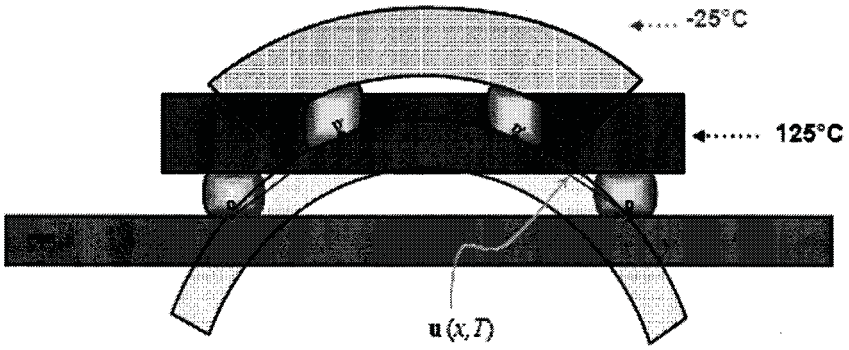


Fig. XIII.1 Displacement vector of the solder due to both internal and external loads

Id. at XIII-2-3, ¶7. Next, Dr. Qu created FEA models for each representative accused package off-board, and computed the displacement of each point "x" at the bottom of each solder ball as a function of temperature:

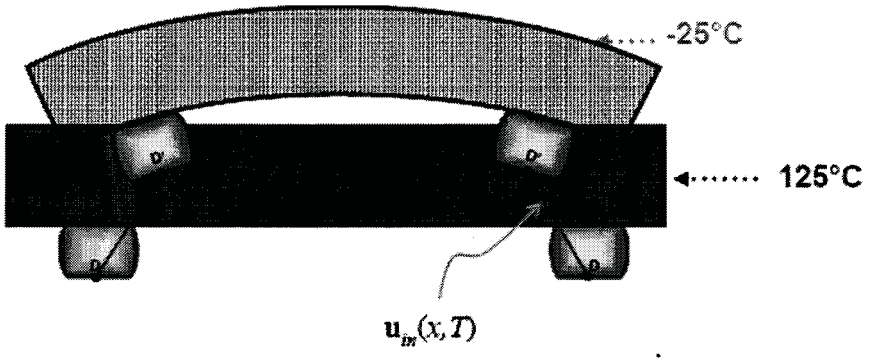


Fig. XIII.2 Displacement vector of the solder due to internal loads

Id. at XIII-3, ¶8. Finally, Dr. Qu computed the difference between the displacement vector due to both internal and external loads (**u**(x,T)) and the displacement vector due to internal loads only

($\mathbf{u}_{in}(x,T)$) for each representative accused package:

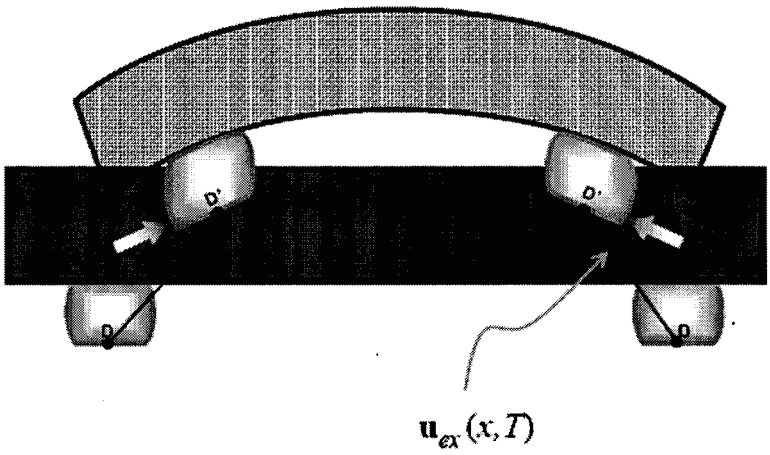


Fig. XIII.3 Applying the displacement vector $u_{ex}(x,T)$ to the off-board package is equivalent to applying external loads to the package.

Id. at XIII-4, ¶9.

After calculating the external displacement vector ($\mathbf{u}_{ex}(x,T)$), Dr. Qu determined the plastic work in the representative accused packages by displacing the bottom of the solder balls according to the external displacement vector without any influence from thermal cycling. *Id.* at XIII-4-5, ¶10. He then directly applied the same external displacement vector for each representative accused package to its corresponding baseline package, also without thermal cycling and determined the plastic work in the baseline package. Finally, Dr. Qu compared the two plastic work calculations. *Id.* at XIII-5, ¶12. According to his analysis, Dr. Qu concluded that, when subjected to only external loads, the accused packages show an improvement in the reliability of the solder joints when compared to their corresponding baseline packages:

[

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CX-3196C (Qu W.S.) Q. 289.

The ALJ criticized Dr. Qu's results because Dr. Qu admitted that chip packages are, in reality, non-linear systems and that his "linearity assumption" is merely an approximation of the packages' behavior. ID at 62. We find the ALJ's criticism to be misplaced. Respondents' expert, Dr. Sitaraman, acknowledged the appropriateness of using the linearity assumption to determine displacement due to only external loads in his own modeling of the alleged prior-art OMPAC and one of the accused products, testifying:

> As I mentioned earlier, the off-board model will provide terminal to chip movement due to internal loads, and the on-board model will provide terminal to chip movement due to internal loads as well as due to the external loads applied by the PCB through the solder balls."

RX-3179 (Sitaraman W.S.) Q. 382;

> Q. So referring, then, to just RDX-27 through and including RDX-35, will you agree, sir, that these charts and tables reflect terminal displacement, not the claimed movement?
>
> A. The first chart, RDX-27, are [*sic*] based on my models. And the rest, from

> 28 all the way to 35, are based on Dr. Qu's model, extracted from his model....
>
> Q. But the data ... reflects displacement, not claimed movement. True?
>
> A. They reflect on-board movement and off-board movement. On-board movement is both internal loads, external loads. Off-board movement is only due to internal loads.
>
> ...
>
> Q. Do you agree with me, sir, that these charts and tables reflect relative displacement from the [terminals] to the chip, not the claimed movement?
>
> A. If you take the difference between the red and the blue, not exactly subtract it, if you compare the on versus off, the difference, quote-unquote difference, should be somewhat reflective of the movement due to external forces alone. On one, I have both internal and external. The other one I have only internal force. The off-board has only internal – movement due to internal forces only, off-board. On-board has movement due to both internal and external. If I lose – <u>if I take the difference between those two, that difference is due to external loads only</u>, and if that appreciably relieves stresses, mechanical stresses, then that's a claimed movement.

Hearing Transcript (Sitaraman) 1058:8 - 1060:2-17 (emphasis added). Respondents also acknowledge that "by comparing terminal-to-chip displacement for a specific package between an on-board and an off-board model, one may estimate the amount of displacement due solely to external loads by subtracting the off-board results from the on-board results. As such, we find that there is no evidentiary support for the ID's conclusion that the linearity assumption is inherently flawed.

Moreover, Dr. Qu's method of determining displacement due to only external loads is inherently logical. Any off-board displacement observed in the accused packages during thermal cycling must be due to internal forces only, as there are no external forces present when the package is off-board. Therefore, any deviation from the off-board displacement when the package is on-board must be due to the counteracting forces applied by the PCB, which is the very

definition of "external load." Therefore, it is completely logical, as confirmed by both Drs. Qu and Sitaraman, to consider this deviation in displacement as an approximation of the external load.

In further analyzing Dr. Qu's second method, the ALJ found that Dr. Qu improperly measured the displacement at the bottom of the solder balls rather than at the terminals, as required by the claim construction of the "moveable" limitation. ID at 63-64. [

] we find, for the reasons stated below, that Dr. Qu's statements do not affect the validity of his testing results.

As Dr. Sitaraman noted, because the solder ball deforms in response to the external load caused by the PCB, the movement of the bottom of the solder ball will not track the movement of the terminal at the top of the solder ball. RX-3179C (Sitaraman W.S.) Q. 271. Dr. Sitaraman concluded that Dr. Qu's attempt to determine the difference in displacements of the bottom of the solder ball when the package is on-board and off-board is not representative of the movement called for by the claims, because the on-board displacement includes solder ball deformation while the off-board displacement does not. *Id.* In fact, it is precisely this deformation of the solder ball that causes the "mechanical stresses" that the invention of the asserted patents seeks to alleviate. *See* RX-260C (Qu, Expert Report) III-6-11 (III.B.).

The external load that causes the "mechanical stress" that the claimed invention seeks to relieve is due to the DTE between the package and the PCB, or more specifically, the difference in

the position of the bottom of the solder ball (at the PCB) relative to the top of the solder ball (at the terminal) when the package is on-board. *See Id.* at III-12, ¶43 ("the terminals on the package substrate are not permitted to move by a similar amount as the contact pads on the PWB, which results in substantial strains on the solder joints"). Without the PCB creating this difference in relative positions, there would be no stress placed on the solder joints.

In order to show infringement, Dr. Qu needed to prove that a package that has the claimed "movement" will demonstrate an "appreciable" decrease in the "mechanical stresses" in the solder joints compared to a package that lacks the claimed "movement." Although the construction of the "movement" limitation requires application of an "external load" "to the terminal" to displace the terminal relative to the chip and relieve "mechanical stress" in the "electrical connections," it is, in fact, the displacement differential between the package and the PCB that causes the "mechanical stress." It is undisputed that the PCB applies all of its force to the bottom of the solder ball, therefore, Dr. Qu correctly chose this point as the focus of his simulated external load. Furthermore, although Dr. Sitaraman is undoubtedly correct that the load applied to the bottom of the solder balls will not exactly match the load applied to the terminals at the top of the solder balls, [

] we find that Dr. Qu properly simulated the external load being applied to the packages by determining displacement at the bottom of the solder balls, at least some of which is transferred to the terminals.

Taking further issue with Dr. Qu's second method, the ALJ found that the off-board/on-board comparison was unable to show that any observed displacement was actually due to external loads as opposed to CTE matching because he found that the actual terminal-to-chip displacement data from Dr. Qu's FEA on-board and off-board models of the representative accused packages demonstrated that "for most of the representative accused chip packages Dr. Qu observed greater terminal-to-chip displacement when the packages were off-board rather than on-board." ID at 64 (*citing* to RX-3483C; RX-3482C)[7]:

Package	On/Off Board	*u*	*v*	*w*	Magnitude *f*(*u*, *v*, *w*) (*mm*)	Magnitude Normalized
stm_mc_tfbga_88_2 (chip 1)	On-Board					
	Off-Board	[				]

RX-3483C;

[

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[7] In creating the exhibits RX-3483C; RX-3482C, Dr. Sitaraman extracted the measurements of the displacement of the terminal (point B) in relation to the chip (point A) from the results of Dr. Qu's

RX-3482C. The ID further finds that, for those few packages that showed greater displacement on-board than off-board, the differences were negligible, and well within the margin of error of Dr. Qu's analysis. ID at 64.

We disagree that the observed magnitude of terminal-to-chip displacement in the off-board packages versus in the on-board packages has any bearing on whether Dr. Qu's second method successfully showed that the increase in solder ball reliability in the accused packages as compared to the baseline packages was due to the terminals being displaced relative to the chip by only external loads. First of all, vectors may have a similar magnitude even if they are oriented in completely opposite directions. *See* RX-260C (Qu, Expert Report) XII-1-4. In the image from exhibit RX-3483C found above, the terminal-to-chip displacement of the package off-board and on-board is captured in the three dimensional *u*, *v*, and *w* directions. The starting point (0, 0, 0) for the displacement vector is the location where the terminal (point B) is relative to a point on the chip (point A) at the start of thermal cycling. Therefore, as seen from the chart, in both situations, the terminal was displaced, for example, left (negative *u*), forward (negative *v*), and closer, or upward (positive *w*), with respect to the chip. The magnitude of the vector (sqrt(u^2 + v^2 +w^2)) is the values $f(u, v, w)$. As such, the magnitude of the on-board and off-board displacement vectors are very similar, as seen from the (0, 0, 0) starting point.

In actuality, however, once the package was on-board, the PCB effectively moved the terminal to the right, backward, and further upward of where the off-board motion (CTE motion) had moved the terminal. Therefore, the PCB had a definite effect on the terminal-to-chip

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on-board versus off-board FEA models. Hearing Tr. (Sitaraman) 772:11-25.

displacement as compared to the off-board terminal to chip displacement. [

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These examples demonstrate the flaws in the ID's conclusion. The ALJ's first error is that he considered the magnitude of the vectors only from the (0, 0, 0) starting point. The correct analysis would have taken into account that when the package is off-board, the CTE motion of the package will displace the terminal a certain distance in a certain direction. This CTE motion would not change even after the package is on-board unless there is outside interference. Any deviation in the distance and direction of the terminal displacement once the package is on-board is due to the forces exerted by the PCB on the terminal. Therefore, the appropriate starting point to consider the terminal displacement affected by only the PCB is where the CTE motion moved the terminal. This is essentially what Dr. Qu did in the first steps of his second method by calculating the difference between the on-board terminal displacement vector and the off-board terminal

displacement vector.

The ALJ's second error was to mistake the implications of the terminal-to-chip displacement due to the external load and its relationship to the improved reliability in the solder balls because he injected CTE matching into his analysis. ID at 64. But Dr. Qu's second method nullifies any need to consider the difference in the CTE characteristics between the accused packages and their corresponding baseline packages because it does not apply thermal cycling to the baseline packages. ID at 64. The only thermal cycling done in method two is that which is applied to the accused packages in order to determine the difference in their on-board and off-board displacement vectors. Once this difference has been determined, the differential displacement is applied directly to both the accused packages and the baseline packages *without the application of thermal cycling*, and it is from these measurements that the plastic work for the accused and baseline packages is calculated. As such, any consideration of the differences in the CTE behavior of the accused and baseline packages is completely irrelevant.

After applying the external displacement vector ($\mathbf{u}_{ex}$) to the accused packages and their corresponding baseline packages, Dr. Qu calculated the plastic work for both packages and determined that there was improved reliability in the accused packages (blue bar) as compared to their corresponding baseline packages (yellow bar):

[

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CX-3196C (Qu W.S.) Q. 289. The ALJ did not give credence to these results because of his conclusion that the more rigid baseline packages were guaranteed to show less reliability than the accused packages. ID at 66. Thus, the ALJ found that Dr. Qu's "artificially stiffer" baseline packages guaranteed that the accused packages would show an increase in reliability. ID at 66. Respondents argue that Dr. Qu did not, in fact, apply the same "external load" to both the accused and baseline packages because, by imposing the same displacement to the "stiff" baseline packages, Dr. Qu effectively applied a greater load to the baseline package as compared to the accused package.

Dr. Qu did acknowledge that he applied a greater load to his baselines than to the accused packages. Hearing Tr. (Qu) 477:12 – 428:11. But Dr. Qu also stated that this is the appropriate result because the accused packages have the claimed "movement" while the baseline packages do

not. *Id.* Decreasing the mechanical stress in the solder balls caused by the discrepancy in displacement between the top and bottom of the solder balls when the package is on-board is basically the point of the invention. The mechanical stress in the solder balls is directly related to the displacement differential between the top and bottom of the solder ball when the package is on-board. The underlying purpose of the claimed "movement" is to minimize the displacement differential between the top and bottom of the solder ball when the package is on-board.

The claimed "movement" requires facilitating the necessary stress relief by moving the terminal with respect to the chip through application of an external load to the terminal. Because the baseline packages minimize terminal-to-chip displacement by design, any force applied to solder balls of the baseline packages should naturally result in more external load being applied to baseline packages. Otherwise, there would be no difference between the baseline packages, which ideally do not have the claimed movement, and the accused packages, which do.

As we previously stated, we find that the baseline packages are not "artificially stiff," since the absence of the compliant layer in the baseline packages is called for in the claim construction of the movement limitation. Therefore, we do not find that there would be any "guarantee" that the accused packages will show an increase in reliability merely because of the way the baseline packages were modeled. Rather, the increase in reliability would result because the accused packages demonstrate the claimed "movement" while the baseline packages do not.

By simulating the external load applied to the packages and applying only this simulated external load to compare the plastic work of the solder joints between a package with a compliant layer and a package without a compliant layer, Dr. Qu successfully demonstrated that the observed

increase in the solder reliability in the accused packages as compared to the baseline packages was due to the external load. The only missing link precluding a finding of infringement is a showing that the demonstrated stress relief in the solder balls of the accused packages was due to terminal-to-chip displacement caused by the applied external load.

In their attempt to discredit Dr. Qu's testing method, Respondents provide this missing link. The ALJ and Respondents relied on Dr. Sitaraman's exhibit to show that there was little difference in the on-board and off-board terminal-to-chip displacement. RX-3483. As the data that Dr. Sitaraman extracted from Dr. Qu's second testing method shows, however, there is terminal-to-chip displacement in the accused packages when an external load is applied. *Id.* As is clear from the data, there is a difference in the positions of the terminals relative to the chip in the accused packages after thermal cycling when the chip is on-board as opposed to when the chip is off-board. This difference in positions is due solely to the external load the PCB is applying to the terminals.

Although [

] the ALJ

acknowledged that the baseline packages were stiffer than their corresponding accused packages. ID at 60. The ALJ's own statement serves to acknowledge that there is less terminal-to-chip displacement in the baseline packages as compared to the accused packages. Therefore, all other things being equal between the accused packages and their corresponding baseline packages, and where thermal cycling does not come into play, such that any effect from the CTE difference between the accused packages and the baseline packages is negated, the only way to account for the

improved reliability of the accused packages over the baseline packages is that there is greater terminal-to-chip displacement in the accused packages. *See Liquid Dynamics Corp. v. Vaughan Co., Inc.*, 449 F.3d 1209, 1219 (Fed. Cir. 2006) ("A patentee may prove direct infringement ... by either direct or circumstantial evidence."); *see also Alza Corp.*, 464 F.3d 1296 (stating that the deficiency in patentee's evidence was not that it was "indirect" rather than "direct" evidence).

Dr. Qu, therefore, showed that the observed terminal-to-chip displacement was caused by direct application of external loads in the absence of any internal loads (*i.e.*, CTE matching) and that the accused packages demonstrated greater reliability over their corresponding baseline packages. The Commission finds that Dr. Qu's second testing method successfully proves that the accused packages infringe the asserted claims by showing that they practice the claimed "movement."[8]

B. Indirect Infringement

Section 271(b) of the Patent Act states: "Whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b). A finding of induced infringement requires a showing that there has been direct infringement and a showing of intent. *DSU Medical Corp. v. JMS Co.*, 471 F.3d 1293, 1303 (Fed. Cir. 2006) (en banc with respect to induced infringement). The intent requirement for induced infringement is specific intent, *i.e.*, the alleged infringer must

[8] In their reply brief to the Commission's Notice of Review, Respondents posit a brand new argument that there is no expert testimony that Dr. Qu's second method independently shows infringement. Not only is this argument improper as it was never raised at any prior point in the investigation, it is wrong as a matter of fact. In his expert report, Dr. Qu clearly states that he believes the results of his second testing method show that the accused packages meet the claimed "movement" limitation, and thus show infringement. *See* RX-260 (Qu Expert Report) at XIII-21.

have not only intent to cause the infringing acts, but must have a specific intent to cause infringement. *Id.* at 1306. Thus, mere knowledge of possible infringement by others does not amount to inducement. The requisite intent may be proven through the use of circumstantial evidence. *Id.* ("While proof of intent is necessary, direct evidence is not required; rather circumstantial evidence may suffice.")

Contributory infringement is defined in section 271(c) of the Patent Act. 35 U.S.C. § 271(c). Under 35 U.S.C. § 271(c) a seller of a component of an infringing product can be held liable for contributory infringement if: (1) there is an act of direct infringement by another person; (2) the accused contributory infringer knows its component is included in a combination that is patented and infringing; and (3) there are no substantial non-infringing uses for the accused component part, *i.e.*, the component is not a staple article of commerce. *See DSU Medical Corp.*, 471 F.3d at 1303. Often a key issue in a contributory infringement analysis is not whether the product "is a staple article of commerce, which is readily apparent, but whether the accused . . . products are 'suitable for substantial non-infringing use[s].'" *Aquatex Indus., Inc. v. Techniche Solutions*, 419 F.3d 1374, 1379 (Fed. Cir. 2005). Complainant has the burden of establishing a *prima facie* case that the accused products are not "suitable for substantial non-infringing use." Once it does so, the burden shifts to respondents to introduce evidence that end-users actually use the accused products in a non-infringing manner. *Golden Blount, Inc. v. Robert H. Peterson Co.*, 438 F.3d 1354, 1363-64 (Fed. Cir. 2006).

Relying on Ground Rule 11.1, the ID finds that Tessera waived any argument that the

accused products indirectly infringe the asserted '326 and '419 patents. ID at 69-70. Ground Rule 11.1 recites in relevant part:

> ...the parties shall file a post-trial brief together with proposed findings of fact and brief conclusions of law.... The post-trial brief shall discuss the issues and evidence tried within the framework of the general issues determined by the Commission's Notice of Investigation, the general outline of the briefs as set forth in Appendix B, and those issues that are included in the pre-trial brief and any permitted amendments thereto. All other issues shall be deemed waived.

Order No. 11 (Oct. 20, 2007). The ID finds that Tessera did not set forth any argument in its initial post-hearing brief that the accused products indirectly infringe the asserted patents. ID at 69. This is especially significant since Tessera admitted that the accused standalone packages cannot directly infringe the '419 patent because the "substrate" required by the claims of that patent refers to a PCB. *Id.* Because the ALJ found that Tessera did not show direct infringement and waived any argument concerning indirect infringement, the ALJ did not make any findings concerning the merits of Tessera's claim that the accused products indirectly infringed the asserted claims of the '326 and '419 patents.

We reverse the finding of waiver because the IA has preserved the issue of indirect infringement by presenting argument concerning indirect infringement in his post-hearing brief. *See* Commission Investigative Staff's Initial Post-Hearing Brief (Reformatted) at 55-57. The IA was a party to the investigation and was required to file a post-hearing brief. 19 C.F.R. § 210.3 ("***Party*** means each complainant, respondent, intervenor, or ***Commission investigative attorney***.") (emphasis added); and Ground Rule 11.1 ("the parties shall file post-hearing briefs..."). Given that the IA preserved the issue in accordance with the ALJ's Ground Rules, we reverse the ALJ's

finding that the issue of indirect infringement was waived for purposes of this investigation.[9] We now turn to the merits.[10]

With respect to induced infringement, the first hurdle, after showing direct infringement, is demonstrating that the alleged infringer had a specific intent to induce infringement, not merely an intent to cause the infringing acts. *See DSU Medical*, 471 F.3d at 1306. The IA alleges that evidence of direct infringement resides with Motorola, one of the named respondents in this investigation. We agree that the evidence shows that Motorola incorporates the accused devices into its products. *See* CPFF 3578-3586.

The IA argues that Respondents engaged in license negotiations with Tessera concerning the '326 and '419 patents and these negotiations indicate that Respondents were aware that their activities might infringe the asserted claims. Respondents counter that the IA has not shown how any Respondent could have had the specific intent necessary to induce infringement in light of the complex modeling Tessera insists is required to assess the presence of claimed movement and determine whether its chips infringe.

In *DSU Medical*, the Federal Circuit found that an alleged infringer did not have the

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[9] Having found that the IA preserved the issue for purposes of this investigation, we need not determine whether Tessera itself waived.

[10] The IA's post-hearing brief asserts indirect infringement with respect to both the '326 and '419 patents, ostensibly preserving the issue in respect to both. Indirect infringement, however, has been asserted only in relation to the '419 patent *See*, Complainant Tessera, Inc.'s Corrected Post-Hearing Brief at 32 ("The Accused Products, When Mounted on a Printed Circuit Board, Incorporate a "Substrate" as Required by Claims 1-8 of the '419 Patent"). As a result, we find that neither Tessera nor the IA has asserted any claim of indirect infringement regarding the '326 patent.

requisite intent to infringe where it did not believe that its accused product infringed the asserted patent. *DSU Medical Corp.*, 471 F.3d at 1307. Given the fact that we agree with Respondents that one of Dr. Qu's testing methods does not, in fact, prove infringement, we find that Tessera has not proven that Respondents had the necessary intent to support a finding of infringement by inducement. Furthermore, the IA does not indicate, and we have not found, any case law to support the proposition that mere licensing negotiations can establish the specific intent required to establish indirect infringement. Therefore, the Commission also finds that the IA has failed to prove that Respondents had the requisite intent to satisfy a finding of infringement by inducement.

With respect to contributory infringement, after showing that there is direct infringement, a complainant must show that the accused contributory infringer knows that its component is included in a combination that is patented and infringing. *DSU Medical*, 471 F.3d at 1303. Unlike with infringement by inducement, however, the threshold scienter requirement is lower. *Metro-Goldwyn-Mayer Studios, Inc. v. Grokster, Ltd.*, 545 U.S. 913 (2005) ("One who makes and sells articles which are only adapted to be used in a patented combination will be presumed to intend the natural consequences of his acts; he will be presumed to intend that they shall be used in the combination of the patent."). Thus, to prevail on contributory infringement, the complainant must show that the alleged infringer made and sold the accused device, that the accused device has no substantial non-infringing uses, and that the alleged infringer engaged in conduct within the United States that contributed to another's direct infringement. *DSU Medical*, 471 F.3d at 1303.

There is no dispute that the accused products have been imported, sold for importation, or

sold after importation in the United States by or on behalf all of the Respondents.[11] ID at 10-12. Also, as discussed previously, the evidence shows that Motorola directly infringes the '419 patent by incorporating the accused devices into its products. Therefore, the only remaining issue is whether there are any substantial non-infringing uses for the accused chip packages.

Tessera has the burden of making a *prima facie* showing that there are no substantial non-infringing uses for the accused packages. *Golden Blount*, 438 F.3d at 1363. Only then does the burden shift to Respondents to present rebuttal evidence. *Id.* Tessera argues that it has provided the necessary showing by alleging that Respondents instruct their customers to connect the accused packages to PCBs using solder. *See* CPFF 1892-97 (Qualcomm); 2000 (Spansion), 2014 and 4320 (ST-NV); 2839, 2841, and 2843 (ATI); and 3210 and 3212 (Freescale). We agree that the evidence constitutes the necessary showing. *See Golden Blount*, 438 F.3d at 1363 (evidence that alleged infringer's instruction sheets taught only the infringing configuration sufficient to create a *prima facie* showing that there were no substantial non-infringing uses for accused product).

Respondents argue that the evidence shows substantial non-infringing uses for the accused packages in that the accused packages can be mounted using "underfill," which restricts the claimed movement, or using sockets, which prevent the need to affix the solder balls to the PCB,

[11] ST-NV claims that to the extent it offers for sale or sells any accused packages within the United States, such packages are first sold through its domestic subsidiary, STMicroelectronics, Inc. ("ST-Inc.") and are licensed and thus not subject to the Commission's jurisdiction. The ID finds that, with the exception of 47 products that Tessera admits fall within the license agreement between Tessera and ST-Inc., ST-NV failed to prove that the remainder of its accused products fall within its license defense. ID at 109-110. We agree.

thus minimizing the external force applied to the solder balls. In analyzing Respondents' rebuttal arguments, an examination of the Federal Circuit's analysis of the contributory infringement doctrine in *Ricoh Co. v, Quanta Computer Inc.* is instructive. 550 F.3d 1325, 1336-1340. In *Ricoh*, the court examined whether an alleged infringer can "escape liability as a contributory infringer merely by embedding [the accused device] in a larger product with some additional, separable feature before importing and selling it." *Id.* at 1337. The court rejected the theory, finding that "[i]f we were to hold otherwise, then so long as the resulting product, as a whole, has a substantial non-infringing use *based solely on the additional feature*, no contributory liability would exist despite the presence of a component that, if sold alone, plainly would incur liability." *Id.*

The question here, therefore, is just what is the accused device in question and whether it, alone, has any substantially non-infringing uses. The ID finds that the accused products are "ball grid array packages that have at least the semiconductor chip in a 'face-up' orientation, a laminate package substrate, a solder ball pitch of less than 1.27 millimeters, and at least one terminal or solder ball beneath a semiconductor chip in the package." ID at 9. Tessera admits that standalone packages cannot directly infringe the '419 patent because the "substrate" required by the claims of that patent refer to a PCB. ID at 69. Looking at claim 1 of the '419 patent, the language requires that "[the]terminal of [the] backing element [be] bonded to [the] contact pads on [the] substrate," where the "backing element" is the package substrate and the "substrate" is the PCB in the accused packages. '419 patent, col. 34:37-39. The claim language further requires that "at least some of [the] terminals of [the] backing element ... [are] moveable with respect to the chip to compensate for differential thermal expansion of the chip and substrate." *Id.* sol. 34:39-43. Finally, the

undisputed construction of the "movement" limitation requires that "the terminals *are capable* of being displaced relative to the chip by external loads applied to the terminals." ID at 49 (emphasis added).[12]

The preceding discussion leads to the conclusion that, with respect to the '419 patent, the accused device must be the combination of a PCB and a face-up BGA package with at least one solder ball for mounting upon the PCB, where the BGA package is capable of exhibiting the claimed "movement." Any additional features of packages that a manufacturer might use in assembling a device using an accused chip package beyond the accused package, solder balls, and a PCB are not included within the relevant definition of "accused device." Therefore, where it is solely the use of an additional feature that inhibits the accused chip packages from exhibiting the claimed "movement," that fact does not affect the conclusion that the accused chip packages, themselves, are not capable of a substantial non-infringing use. *Ricoh*, 550 F.3d at 1337.

Furthermore, since Tessera has made a *prima facie* showing that the accused packages do not have any substantial non-infringing uses, Respondents have the burden to provide evidence that manufacturers actually mounted the accused packages contrary to the provided instructions, or more specifically, by using underfill or sockets. *Golden Blount*, 438 F.3d at 1363-1364. On this point, Respondents argue that underfill was commonly used in the 1990s. RFF.IV.630. Only

[12] The Federal Circuit has held that to find direct infringement of an apparatus claim, an accused device need only be ***capable*** of operating in the infringing mode, and does not need to actually perform the operation, unless the claim language otherwise requires. *Intel Corp v. United States Int'l Trade Comm'n*, 946 F.2d 821, 832 (Fed. Cir. 1991) (affirming the ITC's finding of infringement because "the accused device, to be infringing, need only be capable of operating in the page mode (the infringing mode) and that actual page mode operation in the accused device is

Qualcomm, however, has produced any evidence that its customers have actually used underfill in mounting Qualcomm's accused chip packages. RFF.VII.467-475. Regarding sockets, Respondents again make the general assertion that sockets were commonly used in the 1990s. RFF.IV.643. No Respondent has made any claim regarding their customers' particular use of sockets.

As such, only Qualcomm has provided any rebuttal evidence to the IA's and Tessera's claim that the Respondents contributorily infringe the '419 patent. Even so, this evidence is not enough to overcome Tessera's showing that the accused device, which consists of an accused BGA package, a PCB, and solder balls connecting the accused BGA package to the PCB, has no substantial non-infringing use in and of itself. The Commission, therefore, finds that Respondents have contributorily infringed the asserted claims of the '419 patent.

C. Validity

A claim is anticipated and therefore invalid when "the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation." *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000). To be considered anticipatory, the prior art reference must describe the applicant's "claimed invention sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention." *Helijix Ltd. v. Blok-Lok, Ltd.*, 208 F.3d 1339, 1346 (Fed. Cir. 2000).

The ID finds that Respondents failed to prove by clear and convincing evidence that the

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not required.").

asserted prior art – U.S. Patent Nos. 4,700,473; 5,241,133 ("the '133 patent"); 5,216,278 ("the '278 patent"); or Motorola's OMPAC chip – meets all of the limitations of the asserted claims. ID at 84-91. The ID also finds that the July 1989 offer by Citizen Watch of Japan to make and sell the OMPAC did not constitute an on-sale bar under 35 U.S.C. § 102(b) because it was not on sale more than a year before the June 10, 1990, *conception date* of the asserted patents. ID at 83. The ID further finds that the Motorola OMPAC was not prior art under 35 U.S.C. § 102(g) because the evidence showed that the OMPAC packages were not "made in this country." ID at 88. Finally, the ID finds that the neither the '133 patent nor the '278 patent are prior art to the asserted patents because both have priority dates that are subsequent to the June 10, 1990, conception date of the asserted patents. The Commission adopts the ID's finding that Respondents failed to show that the asserted prior art, including the OMPAC device, meets all of the limitations of the asserted claims. *See* ID at 84-87. This finding is dispositive of all anticipation claims.

With respect to § 102(b), however, the ALJ used the conception date rather than the priority date of the asserted patents to determine whether the alleged sale on the OMPAC qualified as prior art with respect to the "on-sale" bar. The text of the relevant statute, however, reads: "A person shall be entitled to a patent unless...the invention was ... in public use or on sale in this country, more than one year prior to the *date of the application for patent in the United States*." 35 U.S.C. § 102(b) (emphasis added). Unlike the other provisions in § 102, which indicate that a comparison is to be made against the date as of which the patentee "invented" the subject matter, § 102(b) is unique in requiring that a comparison be made against the date the application for the patent was filed in the United States. Therefore, the proper comparison is between the date of the alleged

OMPAC sale (September 1989) and the March 21, 1991 priority date of the asserted patents. The Commission, therefore, modifies the ID to clarify that the statute requires comparing the on-sale date of alleged prior art against the priority date of the asserted patents, not against the conception date. Under this analysis, the OMPAC qualifies as eligible prior art under § 102(b) because the alleged September 1989 sale did occur more than a year before the priority date of the asserted patents. As stated previously, however, we agree with the ID's finding on that the OMPAC does not anticipate under any section of 35 U.S.C. § 102 because it does not read on the claims of the asserted patents. We, therefore, affirm the ID's ultimate finding that the asserted patents are not invalid under § 102(b).

Finally, with respect to § 102(g), the ID finds that the OMPAC is not prior art under this section because the OMPAC was not "made in this country," but rather was made in Japan by Citizen Watch of Japan. ID at 88. The evidence shows, however, that Motorola constructively reduced the OMPAC to practice in this country by filing U.S. Patent No. 5,241,133 on November 16, 1992, and U.S. Patent No. 5,216,278 on March 2, 1992. Because those patents were filed after the June 10, 1990 conception date, under § 102(g), the OMPAC would qualify as prior art only if Respondents could show that Motorola exercised reasonable diligence in reducing the invention to practice and that Motorola did not "suppress" and/or "conceal" the invention.

The ALJ did not make any findings concerning whether Motorola exercised reasonable diligence in reducing the OMPAC to practice or whether Motorola "suppressed" and/or "concealed" the OMPAC invention by subjecting the manufacturer of the OMPAC samples to a confidentiality agreement. As discussed above, however, the ID's finding that the OMPAC does

not read on the claims of the asserted patents is dispositive of the issue of anticipation under any section of § 102. Therefore, the Commission affirms the ID's finding that the asserted patents are not invalid under § 102(g).

D. Remedy, Public Interest, and Bonding

In his RD, the ALJ recommended that, should the Commission determine that a violation exists, a limited exclusion order ("LEO") would be properly directed to Respondents' accused chip packages that are manufactured by or on behalf of, or imported by or on behalf of, Respondents. ID at 124. The ALJ found that, contrary to Respondents' argument, the LEO should include standalone semiconductor chips that are not mounted to PCB boards because the '326 patent does not include a limitation requiring that the semiconductor chip be attached to a PCB substrate. Additionally, the ALJ found that based on the Federal Circuit's holding in *Kyocera Wireless Corp. v. Int'l Trade Comm'n*, 545 F.3d 1340 (Fed. Cir. 2008), any limited exclusion order that may issue in this investigation that covers downstream products must be limited to those downstream products imported by named respondents. ID at 125. Therefore, as Motorola is a named respondent, the ALJ recommended that any LEO should reach Motorola downstream products that incorporate Respondents' infringing chip assemblies. *Id.* The ALJ further recommended that, should the Commission determine that there has been a violation, a cease and desist order should issue against Respondents Motorola, Qualcomm, Freescale, and Spansion. ID at 126. Finally, the ALJ recommended that, should the Commission determine that there has been a violation, a bond be set in the amount of 3.5% the value of the imported accused products during the period of Presidential review in compliance with Section 337(j). ID at 128.

1. Remedy

a. Tessera's Request for a "Tailored" General Exclusion Order

In its Complaint and throughout the proceedings of the current investigation, Tessera requested an LEO that would exclude the accused chip packages and downstream products of both respondents and non-respondents that contain the accused chip packages. Subsequent to the completion of the evidentiary hearing and after post-hearing briefing was submitted, the Federal Circuit decided *Kyocera*, which precludes an LEO from extending to downstream products of non-respondents. In responding to the Commission Notice of Review, Tessera requested for the first time a general exclusion order ("GEO"). Tessera further requested that the GEO should be "tailored" to include only certain categories of downstream products. The IA supports Tessera's request, arguing that Tessera has not waived its request for a GEO and that it has presented sufficient evidence to satisfy the requirements of a GEO. Respondents and various interested parties argue that Tessera has waived any right to request a GEO by asking for one only after the issuance of the final ID and that, in any event, Tessera has not satisfied the requirements for a GEO.

We agree with Tessera and the IA that *Kyocera* constitutes an intervening change in the law such that Tessera is justified in making its late request for relief under the GEO provisions of 19 U.S.C. § 1337(d)(2). Contrary to long-standing Commission practice on which Tessera relied when presenting its case to the ALJ, the Federal Ciruit in *Kyocera* ruled that an LEO may not bar the importation of infringing articles when they are incorporated into downstream products manufactured by non-respondents. *Kyocera*, 545 F.3d at 1356. To the contrary, the court in *Kyocera* stated that "if a complainant wishes to obtain an exclusion order operative against articles

of non-respondents, it must seek a GEO by satisfying the heightened evidentiary burdens of §§ 1337(d)(2)(A) and (B)." *Id.* Tessera is doing so now. Tessera is essentially asking for what it has always requested before the ALJ: an exclusion order that extends to downstream products of unnamed third parties. Notably, while Tessera is now subjecting itself to the higher evidentiary requirements of a GEO, Tessera opposed a remand to the ALJ for an opportunity to enter new evidence that might help it make the higher showings, noting the delay that would result from remand proceedings. Complainant Tessera, Inc.'s Brief on the Issues of Remedy, the Public Interest, and Bonding (February 23, 2009) ("Tessera's Remedy Br.") at 50. Furthermore, while Tessera mentioned that the Commission might itself re-open the record to admit new findings of fact, Tessera never moved for such an action. *Id.* As such, both the increased evidentiary burden and the detriment of not having presented evidence expressly intended to show satisfaction of that burden falls on Tessera.

Nor do we find that permitting Tessera to request a GEO works an unfair surprise on non-respondents. Unnamed downstream manufacturers have been on notice of the possible reach and effect of an exclusion order from the beginning of this investigation. Under the Commission's pre-*Kyocera* practice, it was well-known that a limited exclusion order could extend to unnamed manufacturers if the *EPROMS* factors were satisfied,[13] with the result that any manufacturer of

[13] The so-called *EPROMS* factors originated in *In re Certain Erasable Programmable Read Only Memories*, Inv. No. 337-TA-276, USITC Pub. 2694, Comm'n Op. at 125 (May 1989) ("*EPROMS*"), *aff'd at Hyundai Elec. Indus. Co. v. US. Int'l Trade Comm'n*, 899 F.2d 1204 (Fed. Cir. 1990). They include: 1) the value of the infringing articles compared to the value of the downstream products in which they are incorporated; 2) the identity of the manufacturer of the downstream products (*i.e.*, are the downstream products manufactured by the party found to have

products containing the accused devices could have been implicated even if they were not named as respondents. Unnamed manufacturers could have moved to intervene in this investigation if they believed they might be implicated, but none did.

Interested party Nokia, for example, argues that Tessera knew about Nokia when it filed its complaint. Presumably, Nokia knew about Tessera's complaint, as well. *See* 72 *Fed. Reg.* 28521-2 (May 21, 2007) (notice of institution of the investigation). It is unpersuasive for Nokia now to argue that it had no idea that it might be implicated under a downstream LEO under the Commission's former practice. Because *Kyocera* did not issue until after the conclusion of the evidentiary hearing in this investigation, Nokia did not know that the LEO Tessera sought could not apply to it until long after its opportunity to intervene had passed. Nokia's argument that Tessera should have anticipated how the Federal Circuit would decide *Kyocera* is also unpersuasive.

Respondents argue that Commission precedent bars a complainant's request for a remedial order where the complainant fails to establish its claims of entitlement to that remedial order with argument connecting the record evidence to the requested order in its pre- and post-hearing submissions before the ALJ. *See Certain Automotive Parts*, Inv. No. 337-TA-557, USITC Pub.

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committed the unfair act, or by third parties); 3) the incremental value to complainant of the exclusion of downstream products; 4) the incremental detriment to respondents of such exclusion; 5) the burdens imposed on third parties resulting from exclusion of downstream products; 6) the availability of alternative downstream products which do not contain the infringing articles; 7) the likelihood that imported downstream products actually contain the infringing articles and are thereby subject to exclusion; 8) the opportunity for evasion of an exclusion order which does not include downstream products; and 9) the enforceability of an order by Customs.

4012, Comm'n Op. 11 (June 2008) ("*Automotive Parts*"). Respondents' reliance on *Automotive Parts*, however, is misplaced. Here Tessera is not submitting evidence that was not previously before the ALJ. Rather, Tessera is recharacterizing the evidence to support the relief it now seeks pursuant to *Kyocera*. Furthermore, "the Commission has the power to make factual determinations in the remedy phase of a Section 337 investigation...on the basis of the evidence of record in the violation phase of the investigation, or on the basis of information submitted by the parties in the remedy phase of the investigation." *Certain Integrated Circuit Telecommunication Chips and Products Containing Same Including Dialing Apparatus*, Inv. No. 337-TA-337, USITC Pub. 2570, Comm'n Op. at 21-22 (June 22, 1993). Thus, the Commission finds that Tessera did not fail to file a timely request for relief in the form of a "tailored" GEO.

Turning to the merits, Section 1337(d) provides in relevant part:

> (d) Exclusion of articles from entry
>
> (1) If the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States, unless, after considering the effect of such exclusion upon the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers, it finds that such articles should not be excluded from entry ...
>
> (2) The authority of the Commission to order an exclusion from entry of articles shall be limited to persons determined by the Commission to be violating this section unless the Commission determines that-
>
> (A) a general exclusion from entry of articles is necessary to prevent circumvention of an exclusion order limited to products of named persons; or
>
> (B) there is a pattern of violation of this section and it is difficult to

identify the source of infringing products.

19 U.S.C. § 1337(d) (emphasis added). Thus, under Section 337(d)(1), an exclusion order applies to the "articles concerned," which are the articles specified in the investigation that are the subject of a Commission finding that Section 337 has been violated.

The reach of exclusion orders is further limited by 337(d)(2). Under this sub-section, the Commission may issue exclusion orders only against "persons determined by the Commission to be violating this section." Section 337(d)(2) does, however, provide for two exceptions to this general limitation. The Commission may issue an exclusion order against persons not determined to be violating Section 337 where "a general exclusion from entry of *articles* is necessary to prevent circumvention of an exclusion order *limited to products of named persons*." 337(d)(2)(A) (emphasis added). The Commission may also issue an exclusion order against persons not determined to be violating Section 337 where "there is a *pattern of violation* of this section and it is difficult to identify *the source of infringing products*." 337(d)(2)(B) (emphasis added). The Federal Circuit stated that a complainant who "wishes to obtain an exclusion order operative against articles of non-respondents, [] must seek a GEO by satisfying the heightened burdens of §§ 1337(d)(2)(A) and (B)." *Kyocera*, 545 F.3d at 1356.

We find that Tessera fails to satisfy the requirement under Section 337(d)(2)(A) that a GEO is necessary to prevent circumvention. Tessera concedes that most of the infringing articles it seeks to exclude are manufactured overseas and incorporated into downstream products prior to being imported into the United States. Tessera's Remedy Br. at 32-33, 35 and 43. Accordingly, Respondents' selling the accused chip assemblies for incorporation into downstream products

overseas is pre-existing practice. The Commission has found that such pre-existing practice cannot be the basis for circumvention. *GPS Devices* at 18.

We are not persuaded by Tessera's hypothetical argument that Respondents could circumvent an LEO by "transferring the remainder of their infringing assemblies to their customer's facilities overseas, instead of in the United States, for incorporation into finished products that are then imported into the United States." Complainant Tessera, Inc.'s Reply to the Responses to the Commission's March 26, 2009 Questions on the Issue of Remedy (April 20, 2009) at 23. As noted, Tessera has already conceded that the bulk of the infringing chips are incorporated into downstream products prior to importation. Without clear evidence that the magnitude of the transfer is likely to be substantial, and given that, pursuant to a pre-existing practice, the bulk of infringing chips are imported only after being incorporated into downstream products, we decline to find circumvention.

Tessera's contention that there is a danger of circumvention because players in the industry frequently change corporate form by creating joint ventures, merging, or spinning off business units has already been rejected by the Commission. *See Certain Ground Fault Circuit Interrupters and Products Containing Same*, Inv. No. 337-TA-615, Comm'n Op. at 25-26 (Mar. 26, 2009) ("*Circuit Interrupters*") (rejecting complainant's argument that circumvention of an LEO was likely "because Chinese companies such as the manufacturing respondents frequently change names and/or corporate structure, making them difficult to identify"). Moreover, Tessera's specific argument regarding ST-NV's creation of the joint venture "Numonyx," is similarly unpersuasive. ST-NV's attempt to remove a line of its accused products from this investigation by

transferring the product line to a joint venture could be considered an attempt at circumvention. We do not believe, however, that such activity would escape the Commission's reach under the power of our LEO, which covers both the violating importer or manufacturer and its "affiliates, subsidiaries, related companies, and successors and assigns." *See Circuit Interrupters* at 26.

We find that Tessera also fails to satisfy the requirements for a GEO under Section 337(d)(2)(B). Specifically, Tessera has not made a sufficient showing with respect to the difficulty of identifying the source of the infringing products.[14] In Tessera's various submissions, including its proposed findings of fact and its briefing on remedy, Tessera has provided names of various companies beyond Motorola that it alleges manufacture downstream products that incorporate the infringing chip packages, and which are imported into the U.S, *e.g.*, ST-NV customers, including Samsung, Sony Ericsson, Seagate, Western Digital, Philips, Thomson, and Cisco. Tessera cannot, therefore, claim that it does not know the identity of other downstream manufacturers. In *Kyocera*, the Federal Circuit specifically cautioned against granting a GEO to a complainant that knew the identity of non-respondent downstream manufacturers, but chose not to name those entities in the investigation. *Kyocera*, 545 F.3d at 1357. Likewise, in *GPS Devices*, the Commission declined to grant a GEO where the "[c]omplainants conceded that the 'manufacturers of downstream products containing [respondent's] infringing articles are readily identifiable.'" *GPS Devices* at 19. As did the complainants in *GPS Devices*, Tessera has conceded that Respondents' downstream

[14] Because Tessera has failed to make a sufficient showing with respect to the difficulty of identifying the source of third-party downstream products, we need not reach the issue of whether Tessera has shown a "pattern of violation" concerning importation of downstream products incorporating the infringing chip packages.

manufacturer customers are "readily identifiable." Complainant Tessera, Inc. Pre-Hearing Statement at 391; *see also* Complainant Tessera, Inc. Corrected Post-Hearing Brief at 85 ("Respondents know who the downstream producers are that use their products, and the identity of downstream producers who ... import into the United States downstream products containing Infringing Products is in the record."); Complainant Tessera, Inc.'s Second Corrected Reply to Respondents' Post-Hearing Brief at 44 ("There is no dispute that the downstream producers who would be affected by an exclusion order are Respondents' customers, and thus easily identifiable.")

Tessera argues that the relevant issue is whether the complainant can identify and name in an investigation the sources of the infringing downstream products, not whether the respondents can do so. Tessera complains that Respondents exploited Tessera's inability to identify the source of the pertinent downstream products by requiring Tessera to spend many months utilizing formal discovery procedures to obtain that information. Nevertheless, Tessera admits that it was able to obtain information regarding the source of allegedly infringing downstream products through discovery, and once in possession of this information, Tessera could have moved to amend its Complaint pursuant to Commission Rule 210.14. Without more, Tessera has not established by this argument that it is difficult to identify the source of the infringing products.[15]

Tessera also argues that respondent ST-NV explained that it "does not know the percentage

[15] Our decision does not preclude a party from arguing, in some future investigation, that the delay and expense involved in discovery constitute evidence that it is difficult to identify the source of the infringing products, particularly where Complainant, despite diligent efforts, learns the source of downstream products only after it is no longer possible to amend the complaint to name

of its products that eventually enter the U.S., and cannot identify which of its products, if any, are sold after importation into the U.S. by its customers." ST-NV did not say, however, that it could not identify its customers or that Tessera could not have obtained this information through discovery. Likewise, Tessera's argument that the sheer volume of Respondents' customers makes knowing who they are impossible is contradicted by the fact that the very information it relies on concerning Respondents' sales to their customers also identifies those customers. Therefore, Tessera's argument fails to support its contention that it cannot determine the source of the accused downstream products. Moreover, this argument contradicts the statements Tessera made in its pre- and post-hearing briefs that Respondents know who the downstream producers are that use their products, and the identity of downstream producers who import downstream products containing the accused chip packages.

Based on the previous discussion, the Commission finds that Tessera has failed to satisfy the requirements set forth in Section 337(d)(2) for a GEO. We, therefore, do not find it necessary to reach Tessera's request for a "tailored GEO."

b. Scope of Limited Exclusion Order

We first address Respondents' argument that any LEO should be limited to semiconductors that are mounted to a PCB. Although the asserted claims of the '419 patent explicitly require a PCB, the asserted claims of the '326 patent are not so limited, as the ALJ recognized. ID at 124. Rather, the claim language recites "wherein said terminals are ***moveable*** with respect to said chip." '326 patent, 34:35-36 (emphasis added). The word "moveable" indicates that the terminals are

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additional respondents.

capable of moving with respect to the chip. *Intel Corp v. United States Int'l Trade Comm'n*, 946 F.2d 821, 832 (Fed. Cir. 1991) (emphasis added) ("Because the language of claim 1 refers to '*programmable* selection means' and states 'whereby when said alternate addressing mode is selected', the accused device, to be infringing, need only be *capable* of operating in the [infringing] mode." (emphases added)). The ID's construction of the phrase "the terminals are movable" limitation acknowledges this fact, stating that the claim limitation requires that "in the operation of the assembly, the terminals are ***capable*** of being displaced relative to the chip by external loads applied to the terminals...." ID at 49. Moreover, as discussed previously in the context of Tessera's claim for contributory infringement, we do not believe that Respondents have presented sufficient evidence of the use of underfill with the accused packages. *See supra* at Section V.B.3. Therefore, the Commission's LEO extends to infringing standalone chip packages.

With respect to ST-NV's license agreement, the ALJ found that, with the exception of 47 products that Tessera admits fall within the license agreement between Tessera and ST-Inc., ST-NV failed to prove that the remainder of its accused products fall within its license defense. ID at 109-110. ST-NV did not challenge the ID's finding in its petition for review and the Commission did not review this issue. Therefore, the LEO does not reach those 47 products that the ALJ found are subject to the Tessera-ST-Inc. license agreement.

Respondent Qualcomm argues that any remedial orders must exempt Qualcomm products made by Amkor Technology, Inc. ("Amkor"), an assembly service provider that makes packages for Qualcomm. Qualcomm contends that, pursuant to the decision of the ICC International Court of Arbitration on January 9, 2009, Amkor is licensed under certain Tessera patents, including the

patents asserted in this investigation. Tessera asserts that it is seeking exclusion only against the "unlicensed entry" of infringing products. Since Qualcomm has not presented any evidence that Tessera is overreaching by requesting the exclusion of licensed products, we believe that this is a non-issue. The Commission's LEO covers Respondents' unlicensed infringing chip packages and Motorola's downstream products that incorporate Respondents' unlicensed infringing chip assemblies.

2. Certification Provision

Tessera states that it does not object to an exclusion order that contains a certification provision that permits entities whose products are potentially excludable under the Commission's order to certify, pursuant to procedures to be specified by U.S. Customs and Border Protection ("Customs"), that they are familiar with the terms of the order, that they have made appropriate inquiry, and thereupon state that, to the best of their knowledge and belief, the products being imported are not excluded from entry under the order.

Certification provisions are generally included in exclusion orders where Customs is unable to easily determine by inspection whether an imported product violates a particular exclusion order. In this case, Motorola products that incorporate Respondents' infringing chip assemblies are subject to exclusion. In the absence of a certification provision, Customs may have difficulty determining whether products manufactured and imported by or on behalf of Motorola contain infringing chipsets. Similarly, if any of Respondents enter into a license agreement with Tessera subsequent to the entry of an exclusion order, a certification provision will enable Customs to determine which of Respondents products are no longer subject to exclusion. Therefore, a

certification provision is appropriate and will aid Customs in determining whether imports infringe the asserted patents.

3. Cease and Desist Orders

The ALJ recommended in his RD that the Commission enter cease and desist orders against Respondents Motorola, Qualcomm, Freescale, and Spansion in the event the Commission finds a violation of Section 337 because those respondents each maintain a commercially significant inventory of infringing goods in the United States. ID at 126.[16] We agree that cease and desist orders should issue with respect to Respondents Motorola, Qualcomm, Freescale, and Spansion.

The Commission generally issues a cease and desist order directed to a domestic respondent when there is a "commercially significant" amount of infringing, imported product in the United States that could be sold as to undercut the remedy provided by an exclusion order. *See Certain Condensers, Parts Thereof and Products Containing Same, Including Air Conditioners for Automobiles*, Inv. No. 337-TA-334, Comm'n Op. at 26-28 (Aug. 27, 1997). Because the ALJ found that Respondents Motorola, Qualcomm, Freescale, and Spansion maintain commercially significant inventory of infringing goods in the United States, a cease and desist order is warranted against those respondents.

E. Public Interest

When determining whether to issue remedial orders upon finding a violation of Section 337, the Commission weighs the effect of the orders on four public interest factors: (1) the public health

and welfare, (2) competitive conditions in the U.S. economy, (3) the production of like or directly competitive articles in the U.S., and (4) U.S. consumers. 19 U.S.C. § 1337(d), (f). As Tessera and the IA note, and Respondents do not dispute, there are multiple, licensed sources for semiconductor chips with minimized chip package size. Since we have determined to issue an LEO, only Motorola's downstream products are affected, and Motorola has already taken the option for a license. Therefore, there is no evidence that Tessera's licensees would be unable to adequately supply the United States market if Respondents' products were excluded. Likewise, there are no public health and safety concerns since Tessera has chosen not to seek exclusion of two-way radios imported for use by first responders.

The attached remedial orders, therefore, do not raise public interest concerns that would preclude their issuance.

F. Bonding

The ALJ recommended in his RD that that a bond be set in the amount of "3.5% of the value of the imported accused products," which the parties agreed is the median royalty rate in the semiconductor chip industry. ID at 128. No party has objected to this bond. We find that the ALJ's recommendation is reasonable and set a bond in the amount of 3.5% of the value of the imported accused products until the termination of the period of Presidential review.

G. SPIL Motion

On March 9, 2009, Siliconware Precision Industries Co., Ltd. and Siliconware U.S.A., Inc. (collectively "SPIL Respondents"), respondents in co-pending Inv. No. 337-TA-649, *Certain*

[16] The ALJ did not recommend cease and desist orders against ST-NV or ATI.

Semiconductor Chips with Minimized Chip Package Size and Products Containing Same ("the 649 Investigation"), filed a motion to extend the date for filing reply submissions to the Commission's notice of review of the final ID and to compel the production of Tessera's initial briefing in response to the Commission's Notice. Because the SPIL Respondents are not parties to this investigation and because their motion is without good cause, the SPIL Respondents' motion is denied.

H. Spansion Bankruptcy

On March 11, 2009, Spansion filed a Notice of Commencement of Bankruptcy Proceedings and of Automatic Stay ("Spansion Notice"), indicating that it and certain of its subsidiaries had filed for relief under Chapter 11 of the United States Bankruptcy Code, 11 U.S.C. § 101 *et seq*. Spansion contends that 11 U.S.C. § 362 operates as a stay of this investigation. Any stay would be in effect only with respect to Spansion. We note that, 11 U.S.C. § 362(b)(4) states that "the filing of a petition ... does not operate as a stay under ... subsection (a) of this section [] of the commencement or continuation of an action or proceeding by a governmental unit ... to enforce such governmental unit's or organization's police and regulatory power, including the enforcement of a judgment other than a money judgment." As a governmental agency, the Commission has jurisdiction to determine whether the automatic stay applies to Section 337 proceedings. *See Picco v. Global Marine Drilling Co.*, 900 F.2d 846, 850 (5th Cir. 1990). Preventing violation of domestic industries' intellectual property rights falls squarely within the "regulatory power" of a "governmental unit." Therefore, Section 337 falls within the exception of section 362(b)(4). The Commission, thus, denies Spansion's request to stay the investigation.

I. Respondent Qualcomm's Motion for Leave to File a Petition for Reconsideration of the Commission's Determination Not to Review Indefiniteness

On April 24, 2009, respondent Qualcomm filed a motion for leave to file a petition for reconsideration, pursuant to 19 C.F.R. § 210.47,[17] of the Commission's determination not to review the ID's finding that the asserted claims of the patents-in-suit are not indefinite. The asserted claims of the '326 and '419 patents at issue in this investigation are currently in reexamination proceedings before the U.S. Patent Office ("USPTO"), as are numerous other Tessera patents related to the patents-in-suit. Qualcomm notes that, in a recent Amendment in the reexamination of U.S. Patent No. 6,133,627, one of the parent patents to the '419 patent, Tessera submitted new claims that expressly recite Tessera's claim construction for the "movable" limitation, which was adopted by the ALJ in this investigation. Qualcomm asserts that the USPTO has rejected the new claims as "indefinite" under 35 U.S.C. § 112, ¶2.

As an initial matter, the patent that was subject to the USPTO's rejection is not one of the asserted patents in this investigation. Secondly, the office action reflecting the rejection is not final. Such adverse office actions in the reexamination process are fairly routine and are not an indication that the patent claims are necessarily going to be finally rejected. Although a final rejection has been issued against the asserted claims of the '419 patent and prosecution has been closed in that reexamination proceeding, it would be premature to give undue weight to the reexamination proceedings until or unless Tessera has exhausted its appeals. Therefore, Qualcomm's motion is

[17] Qualcomm notes that its request is past the 14-day period since the Commission's Notice of Review in which petitions for reconsideration must be filed. Qualcomm asks that the Commission waive its rules pursuant to Commission Rule 201.4 because the Office Action containing the

denied.

J. Respondents' Motion to Strike Prowse Affidavit and Cassidy Statement

In support of its February 23, 2009 brief on Remedy, the Public Interest and Bonding, Tessera submitted an affidavit from Dr. Stephen Prowse, a consultant, and a statement from Mr. Bernard Cassidy, Tessera's Senior Vice President and General Counsel. Both the affidavit and statement were offered ostensibly to support Tessera's argument that its requested remedy is not contrary to the public interest. On March 5, 2009, Respondents filed a motion to strike Dr. Prowse's affidavit and Mr. Cassidy's statement. Respondents argue that Dr. Prowse's affidavit is in the nature of an expert report on remedies, and was thus untimely as it was filed after the deadline for submitting expert reports and was not presented in proceedings before the ALJ. Respondents argue that Mr. Cassidy is unqualified to testify regarding remedy or the public interest, and characterize the statement as "a self-serving litany of unsupported, conclusory statements from Tessera's general counsel." Finally, Respondents argue that because Respondents have not had the opportunity to depose Dr. Prowse and Mr. Cassidy to determine the bases for their allegations and opinions, the affidavit and statement should be stricken. *Id.* at 9. On March 16, 2009, the IA filed a response in support of Respondents' Motion to Strike.

Determinations concerning the public interest are in the purview of the Commission, not the ALJ. As such, the ALJ is not permitted under Commission Rule 210.50(b)(1) to take evidence concerning or address the issue of public interest unless specifically asked to do so by the Commission. As for the substance of Dr. Prowse's affidavit, although Dr. Prowse does address

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USPTO's decision issued after the 14-day limit expired.

such issues as downstream products, incremental value to Tessera and incremental detriment to Respondents of an exclusion order, and availability of alternative products that would not be subject to the exclusion order, we find that these factors were appropriately addressed in the context of the public interest rather than strictly in the context of the appropriate remedy. For instance, any analysis of the effect of an exclusion order on the U.S. economy would be difficult without discussing whether or not there are reasonably priced alternative to the goods to be excluded, and such a consideration necessitates a discussion of the possible detriment to Respondents. Similarly, a discussion of the benefit to the public in enforcing U.S. intellectual property rights is furthered by considering the benefit to the complainant in protecting its rights. Therefore, we find that Dr. Prowse's affidavit is proper to the extent that it addresses the public interest concerning issuance of the recommended LEO, and deny Respondents' motion to strike the affidavit. Since we found that Tessera is not entitled to a GEO, we decline to consider any portions of Dr. Prowse affidavit concerning a GEO.

With respect to Mr. Cassidy's statement, Respondents have not given sufficient reason as to why he would be unqualified to testify on the public interest. As with the Prowse affidavit, the Cassidy statement addresses the public interest, in particular, the benefit to the pubic in enforcing U.S. intellectual property rights. We, therefore, deny Respondents' motion to strike Mr. Cassidy's statement.

VI. CONCLUSION

For the reasons discussed herein, the Commission reverses the ALJ's determination that there is no violation of Section 337 with regard to the '326 patent and the '419 patent. We also

reverse the ALJ's determination that that the issue of whether the accused products indirectly infringe the asserted patents has been waived. We find that all Respondents directly infringe the asserted claims of the '326 patent and the '419 patent. Additionally, the Commission finds that the Respondents have contributorily infringed the asserted claims of the '419 patent. Moreover, the Commission affirms the ID's claim constructions and the ID's finding that the asserted patents are not invalid. We also affirm the ID's finding that a domestic industry exists.

The Commission has issued a limited exclusion order against all Respondents and cease and desist orders against all Respondents except ST-NV and ATI because they do not have a commercially significant inventory in the U.S. The Commission has set a bond of 3.5% of the value of the imported accused products.

By order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: June 3, 2009

CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME **337-TA-605**

PUBLIC CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **PUBLIC COMMISION OPINION** has been served by hand upon the Commission Investigative Attorney, Jeffrey T. Hsu, Esq., and the following parties as indicated, on June 3, 2009.

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UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of

CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME

Inv. No. 337-TA-605

NOTICE OF COMMISSION DECISION TO REVIEW IN PART A FINAL DETERMINATION FINDING NO VIOLATION OF SECTION 337

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined to review in part the presiding administrative law judge's ("ALJ") final initial determination ("ID") issued on December 1, 2008 finding no violation of section 337 of the Tariff Act of 1930, 19 U.S.C. § 1337 in the above-captioned investigation.

FOR FURTHER INFORMATION CONTACT: Megan M. Valentine, Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 708-2301. Copies of non-confidential documents filed in connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-2000. General information concerning the Commission may also be obtained by accessing its Internet server at *http://www.usitc.gov*. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *http://edis.usitc.gov*. Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810.

SUPPLEMENTARY INFORMATION: The Commission instituted this investigation on May 21, 2007, based on a complaint filed by Tessera, Inc. of San Jose, California against Spansion, Inc. and Spansion, LLC, both of Sunnyvale, California; QUALCOMM, Inc. of San Diego, California; AT1 Technologies of Thornhill, Ontario, Canada; Motorola, Inc. of Schaumburg, Illinois; STMicroelectronics N.V. of Geneva, Switzerland; and Freescale Semiconductor, Inc. of Austin, Texas. 72 *Fed. Reg.* 28522 (May 21, 2007). The complaint alleges violations of section 337 in the importation into the United States, the sale for importation, and the sale within the United States after importation of certain semiconductor chips with minimized chip package size or products containing same by reason of infringement of one or more claims of U.S. Patent Nos. 5,852,326, and 6,433,419.

On December 1, 2008, the ALJ issued his final ID finding no violation of section 337 by Respondents. The ID included the ALJ's recommended determination on remedy and bonding. In his ID, the ALJ found that Respondents' accused products do not infringe asserted claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of the '326 patent. The ALJ also found that Respondents' accused products do not infringe asserted claims 1-11, 14, 15, 19, and 22-24 of the '419 patent. The ALJ additionally found that the asserted claims of the '326 and '419 patents are not invalid for failing to satisfy the enablement requirement or the written description requirement of 35 U.S.C. § 112 ¶ 1. The ALJ further found that the asserted claims of the '326 and '419 patents are not invalid as indefinite of 35 U.S.C. § 112 ¶ 2. The ALJ also found that the asserted claims of the '326 and '419 patents are not invalid under 35 U.S.C. § 102 for anticipation or under 35 U.S.C. § 103 for obviousness. Finally, the ALJ found that an industry in the United States exists with respect to the '326 and '419 patents as required by 19 U.S.C. § 1337(a)(2) and (3).

On December 15, 2008, Tessera and the Commission Investigative Attorney ("IA") filed separate petitions seeking review of the ALJ's determination concerning non-infringement of the asserted claims of the '326 and '419 patents. Also on December 15, 2008, Respondents filed various contingent petitions seeking review of certain aspects of the ALJ's findings as concern both the '326 and '419 patents in the event that the Commission determines to review the ID's findings concerning non-infringement. On December 23, 2008, Respondents filed an opposition to Tessera's and the IA's petitions for review and Tessera and the IA filed separate responses to Respondents' various contingent petitions for review.

Having examined the record of this investigation, including the ALJ's final ID, the petitions for review, and the responses thereto, the Commission has determined to review the final ID in part. Specifically, the Commission has determined to review the ALJ's finding that Respondents' accused devices do not infringe asserted claims 1, 2, 6, 12, 16-19, 21, 24, and 29 of the '326 patent and asserted claims 1-8, 9-11, 14, 15, 19, and 22-24 of the '419 patent. The Commission has further determined to review the ALJ's finding that Tessera has waived any argument that the accused products indirectly infringe the asserted patents. The Commission has also determined to review the ALJ's finding that the Motorola's OMPAC invention does not anticipate the asserted patents under 35. U.S.C. § 102(b). Finally, the Commission has determined to review the ALJ's finding that the Motorola's OMPAC invention does not anticipate the asserted patents under 35 U.S.C. § 102(g). The Commission has determined not to review the remaining issues decided in the ID.

The parties are requested to brief their positions on the issues under review with reference to the applicable law and the evidentiary record. In connection with its review, the Commission is particularly interested in responses to the following questions:

1. Please address how the absence of the compliant layer affects the effective CTE of the baseline packages in the sense of the material properties of the structures remaining in the baseline. Specifically, to what extent does the CTE of the compliant layer materials affect the effective CTE of the actual packages as compared to their corresponding baseline

packages? Also, how specifically do the substituted materials in the baseline packages affect the effective CTE of the baseline packages.

2. Please address whether Dr. Qu's plastic work analysis can be isolated to the validated range of the finite element analysis ("FEA") models, and if so, whether the validated results are sufficient to satisfy the preponderance of the evidence standard for infringement.

3. Please address whether Tessera may prove infringement by relying on multiple tests rather than one test. In his first test, Dr. Qu demonstrated the existence of terminal-to-chip displacement and its effect on improved reliability in the accused chips by comparing the on-board behavior of FEA models of the accused packages to the on-board behavior of FEA models of their corresponding baseline packages. In his second test, Dr. Qu showed that the accused chips exhibit improved reliability under external loads by directly applying simulated external loads to the accused packages and their corresponding baseline packages. Was it sufficient that Dr. Qu showed the required features of the claimed movement – terminal-to-chip displacement and improved reliability under application of external loads – without directly showing terminal-to-chip displacement due to external loads?

4. Please address whether Motorola exercised reasonable diligence in reducing the OMPAC invention to practice by filing the applications leading to U.S. Patent Nos. 5,241,133 and 5,216,278, and whether the confidentiality agreement between Motorola and Citizen Watch amounted to "suppression" and/or "concealment" of the OMPAC invention.

In connection with the final disposition of this investigation, the Commission may (1) issue an order that could result in the exclusion of the subject articles from entry into the United States, and/or (2) issue one or more cease and desist orders that could result in the respondent(s) being required to cease and desist from engaging in unfair acts in the importation and sale of such articles. Accordingly, the Commission is interested in receiving written submissions that address the form of remedy, if any, that should be ordered. If a party seeks exclusion of an article from entry into the United States for purposes other than entry for consumption, the party should so indicate and provide information establishing that activities involving other types of entry either are adversely affecting it or likely to do so. For background, *see In the Matter of Certain Devices for Connecting Computers via Telephone Lines*, Inv. No. 337-TA-360, USITC Pub. No. 2843 (December 1994) (Commission Opinion).

If the Commission contemplates some form of remedy, it must consider the effects of that remedy upon the public interest. The factors the Commission will consider include the effect that an exclusion order and/or cease and desist orders would have on (1) the public health and welfare, (2) competitive conditions in the U.S. economy, (3) U.S. production of articles that are like or directly competitive with those that are subject to investigation, and (4) U.S. consumers. The Commission is therefore interested in receiving written submissions that address the aforementioned public interest factors in the context of this investigation.

If the Commission orders some form of remedy, the U.S. Trade Representative, as delegated by the President, has 60 days to approve or disapprove the Commission's action. *See* Presidential Memorandum of July 21, 2005, 70 *Fed. Reg.* 43251 (July 26, 2005). During this period, the subject articles would be entitled to enter the United States under bond, in an amount determined by the Commission and prescribed by the Secretary of the Treasury. The Commission is therefore interested in receiving submissions concerning the amount of the bond that should be imposed if a remedy is ordered.

WRITTEN SUBMISSIONS: The parties to the investigation are requested to file written submissions on the issues identified in this notice. Parties to the investigation, interested government agencies, and any other interested parties are encouraged to file written submissions on the issues of remedy, the public interest, and bonding. Such submissions should address the recommended determination by the ALJ on remedy and bonding.

In addition, with respect to the limited exclusion order ("LEO") sought by complainant, please address whether the Federal Circuit's decision in *Kyocera Wireless Corp. v. ITC*, 545 F.3d 1340 (Fed. Cir. 2008), has any impact on whether unnamed importers are covered by the LEO. *Cf.* Additional Views of Chairman Shara L. Aranoff, Vice Chairman Daniel R. Pearson, and Commissioner Deanna Tanner Okun in *Certain GPS Devices and Products Containing Same*, 337-TA-602."

Complainants and the IA are also requested to submit proposed remedial orders for the Commission's consideration. Complainants are also requested to state the dates that the patents expire and the HTSUS numbers under which the accused products are imported. The written submissions and proposed remedial orders must be filed no later than close of business on Friday, February 13, 2009. Reply submissions must be filed no later than the close of business on Monday, February 23, 2009. No further submissions on these issues will be permitted unless otherwise ordered by the Commission.

Persons filing written submissions must file the original document and 12 true copies thereof on or before the deadlines stated above with the Office of the Secretary. Any person desiring to submit a document to the Commission in confidence must request confidential treatment unless the information has already been granted such treatment during the proceedings. All such requests should be directed to the Secretary of the Commission and must include a full statement of the reasons why the Commission should grant such treatment. *See* 19 C.F.R. § 210.6. Documents for which confidential treatment by the Commission is sought will be treated accordingly. All nonconfidential written submissions will be available for public inspection at the Office of the Secretary.

The authority for the Commission's determination is contained in section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337), and in sections 210.42-46 and 210.50 of the Commission's Rules of Practice and Procedure (19 C.F.R. §§ 210.42-46 and 210.50).

By order of the Commission.

Marilyn R. Abbott
Secretary to the Commission

Issued: January 30, 2009

CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME **337-TA-605**

PUBLIC CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **NOTICE OF COMMISSION DECISION TO REVIEW IN PART A FINAL DETERMINATION FINDING NO VIOLATION OF SECTION 337** has been served by hand upon the Commission Investigative Attorney, Jeffrey T. Hsu, Esq., and the following parties as indicated, on January 30, 2009.

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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of **CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME**	**Inv. No. 337-TA-605**

INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND RECOMMENDED DETERMINATION ON REMEDY AND BOND

Administrative Law Judge Theodore R. Essex

(December 1, 2008)

Appearances:
For the Complainant Tessera Corporation:

Wayne M. Barsky, Esq., H. Mark Lyon, Esq., Denis R. Salmon, Esq., Frederick S. Chung, Esq., Y. Ernest Hsin, Esq., Michael B. Smith, Esq., Jason C. Lo, Esq., and Sarah E. Piepmeier, Esq. of Gibson, Dunn & Crutcher, LLP of Los Angeles, CA.

Benjamin W. Hattenbach, Esq., Elliot N. Brown, Esq., and Kenneth Weatherwax, Esq. of Irell & Manella, LLP of Los Angeles, CA.

J. Anthony Downs, Esq., Scott L. Robertson, Esq., Jennifer A. Albert, Esq., and David M. Young, Esq. of Goodwin Proctor, LLP of Washington, DC

F. David Foster, Esq., and Barbara A. Murphy, Esq., of Miller & Chevalier Chartered of Washington, DC

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Paul D. Collier, Esq., Russell E. Levine, P.C., Adam Gill, Esq., Matthew Topic, Esq., and Emily Dempsey, Esq., of Kirkland & Ellis LLP of Chicago, IL.

For the Respondents STMicroelectronics N.V.:

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Paul J. Zegger, Esq. and Geoffrey C. Mason, Esq. of Sidley Austin LLP of Washington, DC.

Karin J. Norton, Esq. of Convington & Burling LLP of Washington, DC.

For the Respondents Freescale Semiconductor, Inc:

Kenneth R. Adamo, Esq., Blaney Harper, Esq., Ric Macchiaroli, Esq., Daniel Volkmuth, Esq., and Douglas Pearson, Esq., of Jones Day of Washington, DC.

For the Commission Investigative Staff:

Lynn I. Levine, Esq., Director; T, Spence Chubb, Esq., Supervising Attorney; Jeffrey T. Hsu, Esq., Investigative Attorney of the Office of Unfair Import Investigations, U.S. International Trade Commission, of Washington, DC.

TABLE OF CONTENTS

The following abbreviations may be used in this Initial Determination:

CDX	Complainants' demonstrative exhibit
CFF	Complainants' proposed findings of fact
CIB	Complainants' initial post-hearing brief
CORFF	Complainants' objections to Respondents' proposed findings of fact
COSFF	Complainants' objections to Staff's proposed findings of fact
CPX	Complainants' physical exhibit
CRB	Complainants' reply post-hearing brief
CX	Complainants' exhibit
Dep.	Deposition
JSUF	Joint Statement of Undisputed Facts
JX	Joint Exhibit
RDX	Respondents' demonstrative exhibit
RFF	Respondents' proposed findings of fact
RIB	Respondents' initial post-hearing brief
ROCFF	Respondents' objections to Complainants' proposed findings of fact
ROSFF	Respondents' objections to Staff's proposed findings of fact
RPX	Respondents' physical exhibit
RRB	Respondents' reply post-hearing brief
RRX	Respondents' rebuttal exhibit
RX	Respondents' exhibit
SFF	Staff's proposed findings of fact
SIB	Staff's initial post-hearing brief
SOCFF	Staff's objections to Complainants' proposed findings of fact
SORFF	Staff's objections to Respondents' proposed findings of fact
SRB	Staff's reply post-hearing brief
Tr.	Transcript

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of **CERTAIN SEMICONDUCTOR CHIPS WITH MINIMIZED CHIP PACKAGE SIZE AND PRODUCTS CONTAINING SAME**	**Inv. No. 337-TA-605**

INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND RECOMMENDED DETERMINATION ON REMEDY AND BOND

Administrative Law Judge Theodore R. Essex

(December 1, 2008)

Pursuant to the Notice of Investigation and Rule 210.42(a) of the Rules of Practice and Procedure of the United States International Trade Commission, this is the Administrative Law Judge's Initial Determination in the matter of certain semiconductor chips with minimized chip package size and products containing same, Investigation No. 337-TA-605.

The Administrative Law Judge hereby determines that a violation of Section 337 of the Tariff Act of 1930, as amended, has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain semiconductor chips with minimized chip package size and products containing same in connection with claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 and claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419. Furthermore, the Administrative Law Judge hereby determines that a domestic industry in the United States exists that practices U.S. Patent Nos. 5,852,326 and 6,433,419.

I. BACKGROUND

A. Institution and Procedural History

By publication of the notice of investigation in the *Federal Register* on May 21, 2007, the Commission instituted this investigation pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, to determine:

> whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain semiconductor chips with minimized chip package size or products containing same by reason of infringement of one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 and claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419, and whether an industry in the United States exists as required by subsection (a)(2) of section 337.

72 FR 28521(May 21, 2007)

The notice of investigation names Tessera, Inc. ("Tessera") as complainant, and Spansion, Inc., Spansion, LLC (collectively "Spansion"), QUALCOMM, Inc. ("QUALCOMM"), ATI Technologies, ULC ("ATI"), Motorola, Inc., STMicroelectronics N.V., and Freescale Semiconductor, Inc. (collectively "Respondents") as respondents. The Commission Investigative Staff ("Staff") of the Office of Unfair Import Investigations is also a party in this investigation. *Id.*

The investigation was originally assigned to Administrative Law Judge Barton. *Id.* On July 5, 2007, the Commission reassigned this investigation from Administrative Law Judge Barton to Administrative Law Judge Charneski. *See* Commission Notice (July 5, 2007). On October 16, 2007, the Commission reassigned this investigation from Administrative Law Judge Charneski to Administrative Law Judge Essex. *See* Commission Notice (October 16, 2007).

The target date for this investigation was originally set at fifteen months. Order No. 3 (July 11, 2007). On May 13, 2008, Order No. 53 issued as an Initial Determination extending the target

date in this investigation to February 20, 2009. *See* Order No. 53 at pp. 2-3 (May 13, 2008). On June 5, 2008, the Commission issued its determination not to review Order No. 53. *See* Commission Notice (June 5, 2008).

The evidentiary hearing in this investigation was held from July 14 through July 18, 2008.

On October 16, 2008, Order No. 63 issued as an Initial Determination extending the target date in this investigation to April 3, 2009. *See* Order No. 63 (October 16, 2008). On November 5, 2008, the Commission issued its determination not to review Order No. 63. *See* Commission Notice (November 5, 2008).

On August 28, 2008, Tessera filed a motion to strike Respondents' supplemental findings of fact addressing reexamination proceedings. (Motion Docket No. 605-135). On September 8, 2008, the Staff filed a response in support of Tessera's motion to strike. On September 8, 2008, Respondents filed an opposition to Tessera's motion. On August 5, 2008, Respondents filed "Respondents' notice of recent office action in reexamination of U.S. Patent No. 5,832,326," which identifies an August 1, 2008 Office Action and attaches a copy of it, but does nothing more. On August 18, 2008 when Respondents filed their objections and rebuttals to Complainant and the Staff's proposed findings of fact, they also included twenty-seven proposed "supplemental" findings of fact addressing the August 1, 2008 Office Action. *See* Respondents' Response to Tessera and Commission Investigations [sic] Staff's Corrected Proposed Findings of Fact and Conclusions of Law, Appendix B (August 18, 2008). Respondents' supplemental findings consist mostly of improper attorney argument discussing the August 1 Office Action. Tessera's motion to strike is hereby Granted. Respondents supplemental findings are hereby stricken from the record in this investigation.

B. The Parties

1. Complainant - Tessera Technologies, Inc.

Complainant Tessera Technologies, Inc. was established on May 10, 1990 as IST Associates by Igor Khandros, Scott Ehrenberg, and Thomas DiStefano. The company was later renamed Tessera Technologies. DiStefano, Tr. 160:12-20; 161:23-162:7. Tessera is headquartered in San Jose, California, with additional development and operational activities in Charlotte, North Carolina; Japan; Israel; Ireland; and Romania. Tessera currently has between 300 and 400 employees. *See* CX-3201C (McWilliams,Wit. Stat.) at ¶¶ 40, 45.

2. Respondents

Respondents ATI , Freescale, Spansion, ST- NV, and QUALCOMM manufacture various types of semiconductor products, including high-end graphic chips, baseband processor for CDMA cellular handsets, flash memory chips. The semiconductor products made by these Respondents are integrated into a number of consumer and industrial products, including, cellular phones, portable media players, cable set-top boxes, two-way radios, network equipment, various uses within automobiles and even washing machines and refrigerators. The remaining Respondent, Motorola, does not manufacture semiconductor devices, but purchases them from suppliers, including the five other named Respondents.

a. Spansion, Inc. and Spansion, LLC

Respondent Spansion Inc. is a Delaware corporation with a principal place of business at 915 Deguigne Drive, Sunnyvale, California. *See* CX-3623 at 3.

b. QUALCOMM, Inc.

Respondent Qualcomm, Inc., is a Delaware corporation with a principal place of business

at 5775 Morehouse Drive, San Diego, California. *See* CX-1862 at 3.

c. ATI Technologies, ULC

Respondent ATI Technologies, a corporation located in Markham, Canada, is currently a wholly owned subsidiary of Advanced Micro Devices, Inc. (AMD). RX-3128C (McLellan, Wit. Stat.) at ¶¶ 5, 6; RX-3356C (McLellan, Reb. Wit. Stat.) at ¶ 3.

d. Motorola, Inc.

Respondent Motorola, Inc. is a Delaware corporation with a principal place of business at 1303 E. Algonquin Road, Schaumberg, Illinois. *See* CX-1855 at 3.

e. STMicroelectronics N.V.

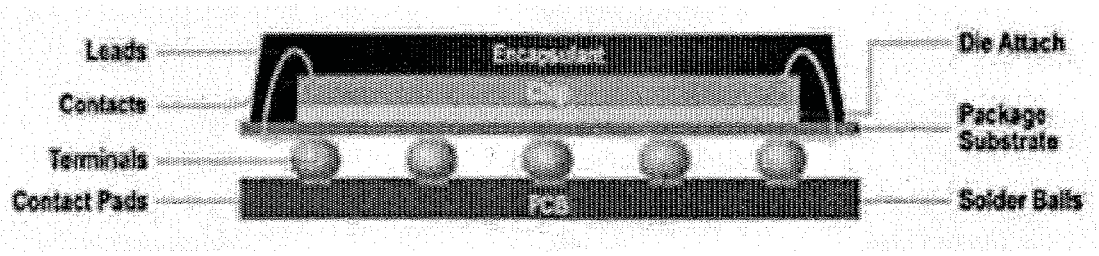
Respondent STMicroelectronics, N.V. is a Netherlands company with its principal place of business at 39, Chemin de Champ des Filles, 1228 Plan-Les-Ouates, Geneva, Switzerland. *See* CX-1342C at ¶ 59; RX-3131C (Malone, Wit. Stat.) at ¶¶ 26, 33. ST-NV manufactures integrated circuits and other transistor commodity-type products, such as memory, in several non-U.S. locations around the world. RX-3131C (Malone, Wit. Stat.) at ¶¶ 34, 35. ST-NV manufactures and assembles the finished chip packages at several non-U.S. locations around the world. *See* Malone, Tr. 1500:11-24.

f. Freescale Semiconductor, Inc.

Respondent Freescale Semiconductor, Inc. is a Delaware corporation with a principal place of business at 6501 William Cannon Drive West, Austin, Texas. Freescale was a division of Motorola, until it was spun off as a separate company in 2004. *See* CX-1853 at 2; RX-3359C (Mawer, Wit. Stat.) at ¶ 6.

C. Overview of the Technology

The technology at issue is directed to increasing the reliability of small format BGA semiconductor chip packages. BGA chip packages come in three varieties: (1) packages that have the front surface of the chip facing away from the package substrate (a.k.a, "face up" packages); (2) packages that have the front surface of the chip facing towards the package substrate (a.k.a., "face down" packages); (3) packages that contain more than one semiconductor chip, which can be either stacked or placed on different locations on the package substrate. CX-3196 (Qu, Wit. Stat.) at ¶ 34. The chip package protects the chip from physical and environmental damage, and connects the chip both electrically and mechanically to external devices. *Id.* at ¶¶ 31, 38. The BGA chip packages at issue in this investigation are "face up" packages. An example of a "face up" small format BGA chip package is illustrated below. *Id.* at 36.



The above figure is a schematic of the cross-section of a BGA package. *Id.* The rectangular shape in the middle labeled "chip" is the semiconductor chip. *Id.* The chip is connected to the bond wire at the chip contact, labeled as "contact." *Id.* The bond wire and the lead portion on the package substrate (a.k.a. backing element) form the leads that connect the chip to the package substrate electrically. *Id.* The bond wire is labeled "leads" in the above figure, and the package substrate is labeled "package substrate." *Id.* The package is connected to the printed wiring board ("PWB") through the solder balls, shown as round-shaped masses in the figure and labeled as "solder balls."

Id. The solder balls connect terminals on the package substrate to the contact pads on the PWB. *Id.* The PWB in the above figure is labeled as "PCB" (printed circuit board). *Id.* The figure also shows a protective layer of encapsulant, which is labeled "encapsulant" and the die attach, which is labeled "die attach." *Id.* at ¶ 37. The die attach is the layer located between the chip and the package substrate. *Id.*

High speed electronic devices generate a considerable amount of heat. JX-1 at 2:7-14. As the speed and functionality of electronic devices has increased over time, the heat they produce has increased correspondingly. CX-058C. This presents a problem for chip packaging, because heat causes different materials to expand at different rates. JX-1 at 4:4-26; CX-3196 (Qu, Wit. Stat.) at ¶¶ 50-51 at p. 9. A semiconductor chip has a much lower coefficient thermal of expansion ("CTE") than either the package substrate or the PCB. The package substrate beneath the chip tends to be constrained by the chip during heating, and expands much less than the PCB. Specifically, when an integrated circuit package heats up and cools down, through repeated cycles, the circuit board and the semiconductor chip will expand and contract at different rates, and different amounts. JX-1 at 4:4-26; CX-3196 (Qu, Wit. Stat.) at ¶¶ 50-51. This can result in the bottom of the solder balls being pulled outward relative to the top so that their shapes becomes distorted or deformed. CX-3196 (Qu, Wit. Stat.) at ¶ 51. When the PCB and chip package are cooled, the bottom of the solder balls can be pulled back relative to the top of the solder balls. *Id.* These repeated cycles of heating and cooling cause strain on the solder balls, and can lead to solder fatigue and ultimately to package failure. CX-3196 (Qu, Wit. Stat.) at ¶¶ 50-51.

D. The Patents At Issue

The patents at issue in this investigation are U.S. Patent No. 5,852,326 ("the '326 patent") and U.S. Patent No. 6,433,419 ("the '419 patent). The '326 patent, titled "Face-Up Semiconductor Chip Assembly," issued on December 22, 1998, from a continuation of App. Ser. No. 861,280 filed on May 21, 1997, which is a continuation of App. Ser. No. 319,966 filed on October 7, 1994, which is a continuation of App. Ser. No. 30,194 filed April 28, 1993, which is a continuation-in-part of App. Ser. No. 586,758 filed September 24, 1990 and a continuation of App. Ser. No. 765,928 filed September 24, 1991, which is a continuation-in-part of App. Ser. No. 673,020 filed March 21, 1991 and App. Ser. No. 586,758. *See* JX-1 (cover page). The '326 patent issued to inventors Igor Khandros and Thomas Distefano. *Id.* The '326 patent lists Tessera as the assignee. *Id.*

The '419 patent, also titled "Face-Up Semiconductor Chip Assemblies," issued on August 13, 2002 from a continuation of App. Ser. No. 08/984,615 filed on December 3,1997, which is a divisional of App. Ser. No. 08/861,280 filed on May 21, 1997, which is a continuation of App. Ser. No. 08/319,966 filed on October 7, 1994, which is a continuation of App. Ser. No. 08/030,194 (a continuation-in-part of App. Ser. No.07/673,020, filed on March 21, 1991, and a continuation-in-part of App. Ser. No. 07/586,758 filed on Sep. 24, 1990), filed as international App. No. PCT/US91/06920 on September 24, 1991, which is a continuation of App. Ser. No. 07/765,928 filed on September 24, 1991, which is a continuation-in-part of App. Ser. No. 07/673,020 filed on March 21, 1991, which is a continuation-in-part of App. Ser. No. 07/586,758, filed on September 24, 1990. *See* JX-2 (cover page). The '419 patent issued to inventors Igor Khandros and Thomas Distefano. *Id.* The '419 patent lists Tessera as the assignee. *Id.*

The '326 and '419 patents share a common specification. *See* JX-1; JX-2.

E. The Products At Issue

The products accused by Tessera in this investigation are ball grid array packages that have at least one semiconductor chip in a "face-up" orientation, a laminate package substrate, a solder ball pitch of less than 1.27 millimeters, and at least one terminal or solder ball beneath a semiconductor chip in the package. Additionally, the accused products must have at least 36 solder balls, a die attach modulus of 3.5 Giga Pascals or less, and not be flip-chip, package-in-package, or tape-based products. *See* CX-3196C (Qu, Wit. Stat.) at ¶ 84; Qu, Tr. at 431:17- 432:17. The investigation also includes downstream products that incorporate the accused products.

Tessera asserts that the accused products in this investigation are at least those products identified by each Respondent in response to Tessera's Interrogatory Requests No. 1 and No. 6. *See* CFF ¶¶ 130-31, 132-43. Respondents identified more than 1,000 packages in response to Tessera's Interrogatory Request No. 1. Qu, Tr. at 431:13-16. Tessera's Interrogatory Request No. 1 asked the Respondents to identify chip packages and products containing what Tessera termed as a "Small Format Laminate BGA Package." Tessera defined "Small Format Laminate BGA Package" to mean "a ball grid array chip package (a) wherein at least one semiconductor chip is in a Face-Up orientation, (b) having a laminate package substrate, (c) having a solder ball pitch of less than or equal to 1.2 millimeters, and (d) where at least one terminal or solder ball is beneath (*e.g.*, within the periphery of) a semiconductor chip in the package." *See, e.g.*, Complainant Tessera's First Set Of Interrogatories (1-5) To Respondent Freescale Semiconductor, Inc. While Tessera asserts that the packages and products identified by Respondents in response to this interrogatory request are accused products in this investigation, Tessera's expert Dr. Qu testified that his infringement analysis only applied to a narrower set of products. Specifically, Dr. Qu testified that he further narrowed

the packages identified by the Respondents as meeting Tessera's definition of "Small Format Laminate BGA Package" to those that also had a die attach modulus of elasticity below 3.5 GPa and greater than 36 solder balls. Qu, Tr. at 431:23-432:5. Thus, contrary to Tessera's assertion, the accused products in this investigation are actually some subset of those products identified by the Respondents in response to Tessera's Interrogatory Requests No. 1 and 6. Nowhere does Dr. Qu provide an actual list of those packages that he opines infringe the asserted claims of the '326 and '419 patents. *See* RX-260C (Qu, Expert Rpt.); RX-3179C (Sitaraman, Wit. Stat.) at ¶¶ 172, 173.

II. JURISDICTION

In order to have the power to decide a case, a court or agency must have both subject matter jurisdiction, and jurisdiction over either the parties or the property involved. *See Certain Steel Rod Treating Apparatus and Components Thereof*, Inv. No. 337-TA-97, Commission Memorandum Opinion, 215 U.S.P.Q. 229, 231 (1981). For the reasons discussed below, the ALJ finds the Commission has jurisdiction over this investigation.

A. Subject Matter Jurisdiction

Section 337 declares unlawful the importation, the sale for importation, or the sale after importation into the United States of articles that infringe a valid and enforceable United States patent by the owner, importer, or consignee of the articles, if an industry relating to the articles protected by the patent exists or is in the process of being established in the United States. *See* 19 U.S.C. §§ 1337(a)(1)(B)(I) and (a)(2). Pursuant to Section 337, the Commission shall investigate alleged violations of the Section and hear and decide actions involving those alleged violations.

With regard to Freescale, the record evidence indicates that Freescale has entered into a stipulation with Tessera as to the facts underlying importation of its accused products. *See* Joint

Stipulation Between Complainant Tessera, Inc. and Respondent Freescale re Importation, Docket No. 291641 (Feb. 4, 2008). Specifically, Freescale stipulates that its accused products have been imported, sold for importation, or sold after importation in the United States by or on its behalf. *Id.* With regard to ATI, the evidence shows that the following ATI products that Tessera accuses of infringement have been made, used, sold, offered for sale, imported into the United States, and sold for importation into the United States: W2182, W2240, W2250, W2261, W2282, W2284. *See* CX-2105 at 5; CX-2099C at 8-9; CX-1179C at 12; CX-1208C. The evidence also shows that ATI is aware that the above accused products are imported into the United States in Motorola phones. *See* Tr. at 1103:3-11. With regard to QUALCOMM, the evidence shows that those QUALCOMM products that Tessera accuses of infringement have been sold to customers in the United States by or on its behalf. *See* CX-2130C, Response to Request For Admission No. 2; CX-2108C, Response to Interrogatory No. 5; CX-3335C. With regard to Spansion, the evidence shows that those Spansion products that Tessera accuses of infringement have been imported into the United States, sold for importation into the United States, or sold within the United States after importation. *See* CX-2142C, Responses to Requests for Admissions 1, 2; JX-266C, at 23:8-24; CX-2945C. With regard to Motorola, the evidence shows that Motorola has imported into the United States or sold in the United States after importation Motorola products that contain semiconductor chip packages Tessera has accused of infringement in this investigation. *See* CX-2120C, Response to Interrogatory Nos. 1-3, Appendices A-E; *see also* CX-2128C; JX-237C at 30:5-14. With regard to ST-NV, a preponderance of the evidence shows that those ST-NV products that Tessera accuses of

infringement in this investigation are imported into the United States in downstream products.[1] *See* CX-3392C, Response to Request for Admission No. 3; CX-3532C, Response to Interrogatory No. 119; CX-3533C, Response to Interrogatory Nos. 108-124; CX-3531C at ¶ 20; JX-285C at 154:6-156:24; CFF 5452 (admitted); ST-NV Reply Brief re: License Agreement at 5.

Accordingly, the ALJ finds the Commission has subject matter jurisdiction under Section 337 of the Tariff Act of 1930.[2] *See* 19 U.S.C. § 1337(a)(l)(A)-(B); *Amgen, Inc. v. U.S. Int'l Trade Comm'n*, 902 F.2d 1532, 1536 (Fed. Cir. 1990).

B. Personal / In rem Jurisdiction

The Respondents do not contest that the Commission has personal jurisdiction over them. RPHS at p. 18. Each Respondent has fully participated in the investigation by, among other things, participating in discovery, participating in the hearing, and filing pre-hearing and post-hearing briefs. Accordingly, the ALJ finds that the Respondents have submitted to the jurisdiction of the Commission. *See Certain Miniature Hacksaws*, Inv. No. 337-TA-237, Pub. No. 1948, Initial Determination at 4, 1986 WL 379287 (U.S.I.T.C., October 15, 1986) (unreviewed by Commission in relevant part).

III. STANDING

Respondents argue that Tessera lacks standing to assert infringement of the '326 and '419 patents because IBM has an ownership interest in the'326 and '419 patents and is not a party to this

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[1] ST-NV alleges that its products accused of infringement by Tessera are subject to a license agreement between Tessera and ST-Inc. (a U.S. subsidiary of ST-NV). ST-NV's license defense is discussed in detail, *infra*, at VIII.

[2] Respondents do not address importation in their initial post-hearing brief and thus according to Ground Rule 11.1 have waived any such argument. *See* Order No. 11 (October 30, 2007). Respondents attempt to address importation in their reply post-hearing brief is improper. *Id.*

investigation. RIB at 78-79. Respondents argue that Dr. Khandros conceived of that which is claimed in the '266 and '977 patents while he was employed at IBM and [

]. *Id.* at 79.

Respondents further argue that because IBM has an ownership interest in the '266 and '977 patents, that IBM also has an ownership interest in the '326 and '419 patents asserted in this investigation because the '326 and '419 patents issued as continuations of the application that gave rise to the '977 patent. *Id.* at 80.

Tessera argues that it is the presumptive owner of the '326 and '419 patents and that Respondents bear the burden of establishing that IBM has an ownership interest in the patents. CIB at 73. Tessera argues that the asserted patents name Khandros and Distefano as the inventors and that patent rights presumptively vest in the named inventors on the patent. *Id.* Tessera argues that Khandros and Distefano assigned their rights in the '326 and '419 patents to Tessera and that the assignment of the asserted patents from the named inventors establishes *prima facie* ownership. *Id.*

Tessera argues that even if IBM was entitled to an ownership interest in the asserted patents, IBM would no longer have such a right as a basic matter of law and equity and thus Respondents also would have no such right. *Id.* at 74. Specifically, Tessera argues that Respondents' challenge to Tessera's ownership of the asserted patents is barred by the applicable statute of limitations and doctrines of latches and equitable estoppel. *Id.* at 75-76. Additionally, Tessera argues that Respondents failed to prove that Khandros and Distefano conceived of the inventions embodied in any of the '266, '977, '326 and '419 patents while at IBM. *Id.* at 77. Further, Tessera asserts that the Federal Circuit has rejected Respondents' argument that IBM's ownership interest in the '266 and '977 patents means that IBM also has an ownership interest in the '326 and '419 patents because

the '326 and '419 patents issued as continuations of the application that gave rise to the '977 patent. *Id.*

The Staff argues that Respondents failed to prove that IBM has an ownership interest in the asserted '326 and '419 patents. SIB at 84-87. Furthermore, the Staff argues Tessera has standing to assert the '326 and '419 patents against Respondents in this investigation. *Id.* at 84. Specifically, the Staff argues that Respondents failed to demonstrate that Drs. Khandros and DiStefano invented what is claimed in the '326 and '419 patents before they left IBM. *Id.* The Staff notes, however, that if the evidence did show that Dr. Khandros and Dr. DiStefano had invented what is claimed in the asserted patents before they left IBM, the signed employment agreement between Dr. Khandros and IBM would control and the asserted patents could not have been assigned to Tessera without IBM's express consent. *Id.*

Standing to sue is a threshold requirement in every federal action. *Sicom Systems, Ltd. v. Agilent Technologies, Inc.*, 427 F.3d 971, 975-76 (Fed. Cir. 2005). The party bringing the action bears the burden of establishing that it has standing. *Id.*; *see also Ortho Pharmaceutical Corp. v. Genetics Institute, Inc.* 52 F.3d 1026, 1033 (Fed. Cir. 1995) *(quoting Whitmore v. Arkansas,* 495 U.S. 149, 154 (1990)) ("It is well established ... that before a federal court can consider the merits of a legal claim, the person seeking to invoke the jurisdiction of the court must establish the requisite standing to sue."). Thus, as complainant, Tessera bears the burden of proof that it has standing to pursue its infringement action against the Respondents in this investigation. While the burden of persuasion remains at all times with Tessera, once Tessera satisfies its initial burden of production showing that it is the owner of the asserted patents, the burden of production shifts to Respondents to rebut such a showing.

There is a presumption in patent law that an inventor owns his invention. *Israel Bio-Engineering Project v. Amgen, Inc.*, 475 F.3d 1256, 1263 (Fed. Cir. 2007). Consistent with that presumption, the "[p]atent issuance creates a presumption that the named inventors are the true and only inventors." *Id.* (quoting *Ethicon, Inc. v. U.S. Surgical Corp.*, 135 F.3d 1456, 1460 (Fed. Cir. 1998)). The named inventors of the asserted '326 and '419 patents are Khandros and Distefano, and as such, it is presumed that Khandros and Distefano are the true and only inventors of the '326 and '419 patents. *See* JX-1; JX-2. According to the record evidence, Khandros and Distefano assigned their entire ownership interests in the '326 and '419 patents to Tessera, specifically agreeing to:

> sell, assign and set over to [Tessera] the entire right, title and interest for the United States of America and all other countries in and to said invention and the aforesaid application for Letters Patent,[3] all original, divisional, continuation, substitute or reissue applications and patents applied for or granted therefor in the United States of America and all other countries, and the Commissioner of Patents and Trademarks is hereby authorized and requested to issue all patents on said improvements or resulting therefrom to [Tessera], as assignee of entire interest herein.

CX-1633 at 3. This agreement is reflected in the fact that Tessera is the named assignee on the face of the '326 and '419 patents. Because Khandros and Distefano are presumptively the true and only inventors of the '326 and '419 patents, their agreement to assign their ownership rights in those patents to Tessera makes Tessera the presumptive owner of the '326 and '419 patents. *See Bd. of Trs. v. Roche Molecular Sys.*, 487 F. Supp. 2d 1099, 1111 n.4 (N.D. Cal. 2007) ("Title to the patent therefore presumptively rests with . . . the named assignee, and Roche is tasked with overcoming this presumption to defeat Stanford's standing.").

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[3] The "aforesaid application for Letters Patent" refers to international application PCT/US91/06920, which was filed on September 24, 1991, and designated the United States. *See* CX-1633 at 1, 3. PCT/US91/06920 gave rise to the '977 patent, which is an ancestor of the asserted patents. *See* RX-6 at QTSI00595298.

Respondents' argument in rebuttal rests on its assertion that if IBM has an ownership interest in the '266 and '977 patents, then IBM also has an ownership interest in the asserted '326 and '419 patents, because the '326 and '419 patents are continuations of the '266 and '977 patents. Specifically, Respondents argue that both of the asserted patents issued from continuations of the application that gave rise to the '977 patent, which means that the asserted patents necessarily contain the same subject matter disclosed in the '977 patent. *See* RIB at 80. Thus, Respondents argue that an assignment that is effective for the parent '977 patent is effective for the asserted patents. *Id.* Respondents do not cite any case law or statute to support their argument. Rather, Respondents rely solely on Section 306 of the Manual for Patent Examination and Procedure ("MPEP"), which states:

> In the case of a division or continuation application, a prior assignment recorded against the original application is applied (effective) to the division or continuation application because the assignment recorded against the original application gives the assignee rights to the subject matter common to both applications. Although the assignment recorded against an original application is applied to the division or continuation application, the Office's assignment records will only reflect an assignment of a division or continuation application (or any other application) if a request for recordation in compliance with 37 CFR 3.28, accompanied by the required fee (37 CFR 3.41), is filed.

MPEP § 306; *see also* RIB at 80. MPEP Section 306 is procedural, setting forth the way the PTO chooses to handle assignments in the case of a division or continuation application. Contrary to Respondents' argument, Section 306 does not bestow any substantive ownership rights on the recorded assignee(s) of the original application.

"Issues of patent ownership are distinct from questions of inventorship." *Israel Bio-Engineering Project*, 475 F.3d at 1263 (citing *Beech Aircraft Corp v. EDO Corp.*, 990 F.2d 1237, 1248 (Fed. Cir. 1993). Whereas inventorship depends on a person's contribution to the conception

or reduction to practice of an invention, "[o]wnership depends upon the substance of what was granted through assignment." *Id.* at 1265. The Federal Circuit's disposition of the standing issue in *Israel Bio-Engineering Project* illustrates this point. In *Israel Bio-Engineering*, the party challenging ownership argued that an assignment of "Proprietary Information" included an assignment of all the subject matter in a patent, based on the notion that patent assignments "attach to patents as a whole, not individual claims." 475 F.3d at 1267. The Federal Circuit rejected the argument, holding that the assignee was "entitled only to ownership of patents on the subject matter included within Proprietary Information, nothing more. As such, while an assignment of a patent must attach to the patent as a whole, here the issue was ownership of a future invention, which became the subject matter of only one claim." *Id.* Accordingly, in order to discern what rights, if any, IBM has in the asserted patents, the language of the 1986 IBM intellectual property agreement must be examined.

[

] Thus, in order to prove that IBM has an ownership interest in the asserted patents, Respondents must show that Khandros made or conceived of an invention claimed in the asserted '326 or '419 patents while he was employed at IBM. See *Israel Bio-Engineering Project*, 475 F.3d at 1263 (citing *Jones v. Hardy*, 727 F.2d 1524, 1528 (Fed. Cir. 1984) ("each claim in a patent is considered as defining a separate invention.")). Respondents, however, do not set forth

any evidence that Khandros made or conceived of an invention claimed in the asserted patents while he was employed at IBM. *See Slip Track Systems, Inc. v. Metal-Lite, Inc.*, 304 F.3d 1256, 1263 (Fed. Cir. 2002) ("Conception must include every feature or limitation of the claimed invention."). Respondents only argue that Khandros conceived of that which is claimed in the '266 and '977 patents. Thus, Respondents have failed to rebut Tessera's evidence of ownership.

Moreover, the record evidence shows that the IBM Technical Disclosure Bulletin ("TDB") on which Respondents rely in arguing that Khandros conceived of the inventions claimed in the '266 and '977 patents, is not directed to the problems solved by the '326 and '419 patents. *See* Tr. at 1624:24-1625:3, 1625:12-17. Tessera's expert Dr. Ivey testified that the TDB is directed to a technology used in IBM mainframe computers called a "thermal conduction module" ("TCM"). *See* Tr. at 1620:2-9; *see also* Tr. at 1620:10-12 (further stating that a TCM is approximately 6 inches on a side and one-inch thick, and weighs about 10 pounds). Respondents' expert Dr. Schaper also confirmed that the disclosure bulletin relates to IBM's TCM technology. *See* RX-3380C at ¶ 26.

Furthermore, the record evidence shows that the IBM TDB fails to disclose several claimed elements of the asserted patents. *See* CX-3205C (Ivey, Wit. Stat.) at ¶ 428-30 ("I do not believe that the subject matter of the '326 patent was suggested by or resulted from work done in connection with the IBM Technical Disclosure Bulletin "Method of Testing Chips and Joining Chips to Substrates." And I do not believe that the subject matter of the '419 patent was suggested by or resulted from work done in connection with the IBM Technical Disclosure Bulletin "Method of Testing Chips and Joining Chips to Substrates."). Specifically, the evidence shows that the IBM TDB fails to disclose a "backing element," as called for by both the '419 or '326 patents. *See id.* at ¶¶ 433-34; *see also* JX-1 at 34:23; JX-2 at 34:32. The evidence also shows that the IBM TDB fails to disclose "bonding

wires," as called for by both the '419 or '326 patents. *See* CX-3205C (Ivey, Wit. Stat.) at ¶ 434. Additionally, the evidence shows that the IBM TDB fails to disclose bonding wires that extend downwardly alongside said edges of said chip. *See id.*; *see also* JX-1 at 34:32.

Accordingly, for the reasons discussed above, the ALJ finds that Tessera, as the presumptive owner of the asserted patents, has standing to raise its infringement allegations against the Respondents in this investigation.

IV. TESSERA'S RENEWED MOTION FOR SANCTIONS

On August 4, 2008, Tessera filed a renewed motion for sanctions against Respondent ST-NV. (Motion Docket No. 605-131). Tessera asserts in its renewed motion that ST-NV failed to comply with discovery Order No. 50, which compelled ST-NV to produce certain witnesses and respond to outstanding interrogatories and requests for admission. *See* Order No. 50 at 2-6. Tessera argues that it is entitled to various adverse inferences against ST-NV for their failure to comply with Order No. 50. Tessera Memo. at 2-3. ST-NV argues that it complied with Order No. 50 and therefore sanctions are unwarranted. ST-NV Memo. at 1. ST-NV also argues that Tessera has failed to prove that it has suffered any prejudice. *Id.* at 2. The Staff argues that Tessera's motion for sanctions should be denied because Tessera failed to prove that ST-NV did not comply with Order No. 50.

Pursuant to Commission Rule 210.33(b)(2), the ALJ has the authority "for the purpose of permitting resolution of relevant issues and disposition of the investigation" to sanction a party failing to comply with a discovery order. *See* 19 C.F.R. §§ 210.33(b)(2). As a non-monetary sanction the Rules permit the ALJ to make adverse inferences against said party. *Id.*

Order No. 50 required ST-NV to make Messrs. Licciardo and Perillat, and a Rule 30(b)(6) witness available no later than Tuesday, February 26, 2008. *See* Order No. 50 at 3-4. Tessera

provides no argument or basis for sanctions regarding ST-NV's production of these witnesses. Indeed, Tessera's Renewed Motion acknowledges that ST-NV was "in the process" of producing the witnesses when this investigation was stayed on February 26, 2008. Tessera Memo. at 10, n.2. After the stay was reversed, the depositions were completed in late May without apparent dissatisfaction by either party. Therefore, no sanctionable conduct is asserted or found with respect to the production of witnesses required by Order No. 50.

ST-NV's compliance with Order No. 50 in other respects is not as clear. Order No. 50 compelled ST-NV to "fully respond" to a number of outstanding interrogatories and requests for admission by Friday, February 22, 2008.[4] Order No. 50 at 5-6. While the record does show that ST-NV provided Tessera with updated interrogatory responses and answers to requests for admissions by the February 22, 2008 deadline set in Order No. 50, Tessera argues that ST-NV's responses contained "serious deficiencies" that resulted in prejudice to Tessera. *See* Tessera Memo. at 10.

In particular, Tessera argues that on June 5, 2008, during a "meet and confer" between the parties, ST-NV agreed to supplement its February 22 responses, but failed to actually provide the supplementation until July 3, 2008.[5] Tessera Memo. at 10-11. Tessera argues that the overall delayed nature of the production, including the "belated" July 3, 2008 responses, was prejudicial.

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[4] Tessera's Interrogatory Nos. 1, 31, 71, 72, and 76 and Eighth Set of Interrogatories.

[5] "[W]hile objecting in numerous respects...ST-NV committed...to: (1) provide a Supplemental Appendix to Tessera Interrogatory Nos. 108-109 to identify all sales by any ST entity, including sales made in the United States; (2) confirm whether the products disclosed in its supplemental responses met the technical definitions of 'small format laminate BGA packages;' (3) provide built sheet assembly ("BSA") documents to the extent they existed; (4) supplement its response to Interrogatory No. 110, which required a complete and detailed explanation that ST-NV undertook to determine whether its accused products were imported into the United States; and (5) supplement its responses to Request for Admission Nos. 67-69, 80-82, 85, 88-90, and 96-103."

Tessera Memo. at 14. Additionally, Tessera notes that ST-NV missed three self-imposed deadlines before providing the supplementation.

That ST-NV failed to meet its own self-imposed deadlines does not diminish the fact that ST-NV voluntarily supplemented its February 22, 2008 responses within one month of committing to do so during the June 5 meet and confer. ST-NV has staunchly maintained throughout discovery that the term "Small Format Laminate BGA" is not a ST-NV designation, and therefore production of information limited to that designation required time-consuming technical review. Tessera has provided no evidence to the contrary and thus under the circumstances, the ALJ finds ST-NV's supplemental production on July 3, 2008 not unreasonable. Even assuming *arguendo* that ST-NV's supplemental responses were overdue, Tessera bears some of the blame having itself taken six weeks after the stay was lifted to make notice that ST-NV's February responses were inadequate. Having waited six weeks to contact ST-NV, the ALJ finds Tessera's argument that ST-NV's February 22 productions were "grossly inadequate" and "seriously deficient" unpersuasive.

Tessera also contends in its renewed sanctions motion that even if timely, ST-NV's responses failed to meet the substantive obligations of Order No. 50 because the answers failed to provide any "meaningful information." Tessera particularly objects to ST-NV's responses stating that "a reasonable search was conducted and no information was found."[6] Tessera Memo. at 19-20. According to Tessera, this type of answer does not meet ST-NV's obligations because Order No. 50 stated that "evidence shows that ST-NV does have information beyond that which has been previously disclosed..." Tessera Memo. at 17(quoting Order No. 50 at 5). While Tessera does not explain what is meant by that statement, it appears that Tessera is acting under the belief that the

[6] Examples are Supplemental Responses to Interrogatory Nos. 110, 118, 119, and 120.

ALJ's statement in Order No. 50 represented a finding that for each and every contested interrogatory response and request for admission the ALJ had determined that additional information beyond that which had previously been disclosed existed. Such an extrapolation is unwarranted. The statement in Order No. 50 on which Tessera relies was meant only to compel ST-NV to provide information that it had "beyond" what had been previously disclosed. Order No. 50 at 5-6. Order No. 50 never compelled, nor did the ALJ intend it to compel, ST-NV to provide new information for each and every interrogatory and request for admission. The fact that Tessera may not like the responses it received does not diminish the fact that ST-NV provided responsive answers to Tessera's interrogatories and requests for admission.

The burden of showing that ST-NV failed to comply with Order No. 50 falls on Tessera as the party bringing the motion for sanctions. As discussed in detail below, the ALJ finds Tessera has failed to prove that ST-NV did not provide the required responsive information compelled under Order No. 50. First, Tessera concedes that ST-NV turned over useful information on the February 22, 2008 deadline. The production included, among other responses and admissions, a list of small format laminate BGA packages sold worldwide in 2007.[7] *See* Tessera Memo. at 15. Nevertheless, Tessera argues that ST-NV's compliance with Order No. 50 is evidence of prejudice because it led to a need for further discovery. *Id.* at 15-16. Tessera's argument is not persuasive. Dr. Qu's opportunity to supplement his witness statement aside, a motion for sanctions is not the correct instrument through which to remedy the problem Tessera identifies in its renewed motion. As a general matter, a disagreement between the parties about what information is discoverable is

[7] "ST-NV's February 22 disclosures provided for the first time a list of its small format laminate BGA products sold worldwide in 2007...disclos[ing] more than 100 additional products subject to this investigation." (Renewed Motion at 15).

properly put before the ALJ through a motion to compel. Tessera filed such a motion in this case with respect to worldwide sales data and a few other matters. ST-NV's contention that it complied with Order No. 50 is not contradicted by Tessera's suggestion that the compliance was overdue. ST-NV will not be sanctioned for its undisputed compliance with Order No. 50 on the grounds that such compliance created new discovery problems for Tessera.

Second, Tessera's argument that ST-NV's responses stating that "a reasonable search was conducted and no information was found" are *per se* inadequate is unpersuasive. *See* Tessera Memo. at 16-20. Absent a showing by Tessera that ST-NV is being dishonest, there is nothing inappropriate with a party responding to a discovery request by indicating that the party searched but could not find any responsive information. Also, to the extent that ST-NV's responses referred Tessera to information elsewhere in the record (such as information provided by third parties), the ALJ finds those responses are not inconsistent with Order No. 50. *See* Tessera Memo. at 21 (discussing ST-NV's failure to re-provide information that is elsewhere in the record in response to Interrogatory Nos. 119 and 76). Tessera points to the so-called 'tear down' reports as evidence that ST-NV failed to provide a complete and honest response to the interrogatories or requests for admission. However, Mr. Ives' deposition from January 18, 2008, which Tessera cites in its renewed motion for sanctions, does not indicate that ST-NV kept or maintained copies of the *iSuppli* "tear down" reports. *See* Tessera Memo. at 22-25. Mr. Ives' testimony only indicates that ST-NV maintained a subscription to the third party database with the reports, but does not establish that ST-NV had independent information on the subject. Moreover, Tessera cannot establish prejudice with respect to these reports because it was free, along with the rest of the public, to access the same reports for a fee paid to *iSuppli*. Tessera also points to ST-NV's advertisements and a corporate earnings call in support

of its argument that ST-NV provided incomplete responses to the interrogatories and requests for admission. Contrary to Tessera's argument, the ALJ does not find that the earnings call or advertisements provide any basis from which to conclude that ST-NV's February 22, 2008 responses were incomplete or inaccurate. The advertisements and earnings call do not specify any particular ST-NV customer or accused product which is consistent with ST-NV assertion that it knew generally of the types of downstream products that might be found with ST-NV chips, but was never in possession of specific, independent documentation of such. *See* ST-NV Memo. at 9-12. The ALJ agrees with the Staff that "ST-NV plausibly contends that it does not have *independent information* on [downstream] importations...[and] should not be subject to sanctions for failing to produce information that it apparently does not have." *See* Staff's Memo. at 4-5.

Tessera further argues that "there is no indication that ST-NV made any genuine effort to...come up with additional responsive information" and it is "implausible" that ST-NV made such an effort. Tessera Memo. at 20. However, beyond attorney argument, Tessera provides no evidence in support of such an argument. With regard to Tessera's characterization of ST-NV's efforts as "implausible," the ALJ finds that characterization to be nothing more than unfounded hyperbole.

Finally, Tessera argues that ST-NV has refused to provide overseas sales data concerning third-party Seagate and that "ST-NV continues to unreasonably resist admitting that the importation element has been established in this Investigation." Tessera Memo. at 41. Contrary to Tessera's argument, the record indicates that ST-NV did provide Tessera its sales data regarding Seagate when it supplemented its responses to Tessera's Eighth Set of Interrogatories.[8] ST-NV is only required

[8] "ST-NV has conducted a reasonable search for responsive 'sales invoices'...ST-NV's sales records are stored electronically in a database and, though no existing sales invoices have been located, a sales invoice record of any particular sales transaction can be created from the database in hard copy

to provide the information it has in a format "as...kept in the usual course of business." *See* Fed. R. Civ. Pro. 34(b)(2)(E)(i-iii). Tessera has not shown that ST-NV failed to provide the overseas sales data it possesses concerning Seagate Technologies. Therefore, the ALJ finds Tessera's argument unpersuasive.

Accordingly, for the reasons discussed above, including ST-NV's substantial compliance with its obligations under Order No. 50 and Tessera's failure to show prejudice or unreasonable delay resulting from ST-NV's conduct, Tessera's Renewed Motion for Sanctions is denied.

V. CLAIM CONSTRUCTION

A. Applicable Law

Any finding of infringement or non-infringement requires a two-step analytical approach. First, the asserted patent claims must be construed as a matter of law to determine their proper scope.[9] Second, a factual determination must be made as to whether the properly construed claims read on the accused devices. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995)(*en banc*), *aff'd*, 517 U.S. 370 (1996).

Claim construction begins with the language of the claims themselves. Claims should be

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format on paper. Such records, if created, would be similar to, and would have the same substantive information as contained in, the sales reports and other information contained in the First Amended appendix A and Appendix C to ST-NV's responses to Tessera's Eighth Set of Interrogatories. *ST-NV further notes that First Amended Appendix A and Appendix C to ST-NV's responses to Tessera's Eighth Set of Interrogatories reflect overseas sales of Small Format Laminate BGA Packages to Seagate Technologies* (and/or one or more of its parents, subsidiaries, or affiliates)." Amended Supplemental Response to Request for Admission No. 101 (emphasis added).

[9] Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vanderlande Indus. Nederland BV v. Int'l Trade Comm.*, 366 F.3d 1311, 1323 (Fed. Cir. 2004); *Vivid Tech., Inc. v. American Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

given their ordinary and customary meaning as understood by a person of ordinary skill in the art, viewing the claim terms in the context of the entire patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1170 (2006).[10] With respect to claim preambles, the Court of Appeals for the Federal Circuit has explained that:

> [A] claim preamble has the import that the claim as a whole suggests for it. In other words, when the claim drafter chooses to use both the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects.

Eaton Corp. v. Rockwell Int'l Corp., 323 F.3d 1332, 1339 (Fed. Cir. 2003) (quoting *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995)).

In some instances, claim terms do not have particular meaning in a field of art, and claim construction involves little more than the application of the widely accepted meaning of commonly understood words. *Phillips*, 415 F.3d at 1314. In such circumstances, general purpose dictionaries may be helpful. In many cases, claim terms have a specialized meaning, and it is necessary to determine what a person of skill in the art would have understood disputed claim language to mean, by analyzing the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, as well as the meaning of technical terms, and the state of the art. *Id.* (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)).

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[10] Factors that may be considered when determining the level of ordinary skill in the art include: "(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir, 1983), *cert. denied,* 464 U.S. 1043 (1984).

In cases in which the meaning of a claim term is uncertain, the specification usually is the best guide to the meaning of the term. *Id.* at 1315. As a general rule, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Markman*, 52 F.3d at 979. However, the specification is always highly relevant to the claim construction analysis. The specification is usually dispositive. It is the single best guide to the meaning of a disputed term. *Phillips*, 415 F.3d at 1315. Moreover, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Id.* at 1316.

In any event, claims are not necessarily, and are not usually, limited in scope to the preferred embodiment. *RF Delaware, Inc. v. Pacific Keystone Techs., Inc.*, 326 F.3d 1255, 1263 (Fed. Cir. 2003); *Decisioning.com, Inc, v. Federated Dep't Stores, Inc.*, 527 F.3d 1300, 1314 (Fed. Cir. May 7, 2008) ("[The] description of a preferred embodiment, in the absence of a clear intention to limit claim scope, is an insufficient basis on which to narrow the claims").

Furthermore, claim interpretations that exclude the preferred embodiment, are "rarely, if ever, correct and require highly persuasive evidentiary support." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583, 39 USPQ2d 1573, 1578 (Fed. Cir. 1996). Such a conclusion can be mandated in rare instances by clear intrinsic evidence, such as unambiguous claim language or a clear disclaimer by the patentees during patent prosecution. *Elekta Instrument v. O.U.R. Sci. Int'l*, 214 F.3d 1302, 1308 (Fed. Cir. 2000); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319 (Fed. Cir. 2002).

If the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence may be considered. Extrinsic evidence consists of all evidence external to the patent and the prosecution history, including inventor testimony, expert testimony and learned treatises. *Id.* at

1317. Inventor testimony can be useful to shed light on the relevant art. In evaluating expert testimony, a court should discount any expert testimony that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent. *Id.* at 1318. Extrinsic evidence may be considered if a court deems it helpful in determining the true meaning of language used in the patent claims. *Id.*

B. The Level of Ordinary Skill in the Art

Tessera asserts that a person of ordinary skill in the art to which the '326 and '419 patents pertain would be someone with a bachelors degree in engineering and a few years of experience in electronic packaging, or an equivalent combination of education and/or experience. See CX-3196C at ¶62. Respondents assert that a person of ordinary skill in the art to which the asserted patents pertain would have at least a bachelors degree in electrical, mechanical, or chemical engineering, or at least a bachelors degree in chemistry or physics, or equivalent formal education, and would have at least three years of work or research experience in some form of electronic packaging, which could include design, process development, package manufacturing, or related areas. RX-2950 at ¶ 97. Additionally, Respondents propose that a person of ordinary skill in the art could also be someone with an advanced degree in electrical, mechanical, or chemical engineering, chemistry or physics and at least one year of relevant work or research experience. *Id.* at ¶ 98. According to Respondents, that person would be familiar with the variety of packaging techniques, materials, reliability considerations, and processes generally used in the industry and would also be familiar with a variety of design and fabrication techniques for dealing with the differential thermal expansion of various components used in electronic packaging. *Id.* The Staff argues that a person

of ordinary skill in the art of the '326 and '419 patents is a person with a bachelor of science degree in engineering (electrical, chemical or mechanical) and a few years of experience in electronic packaging field, or a person with an advanced degree in one of these fields and at least one year of experience in electronic packaging. SIB at 10-11.

Tessera's and Respondents' definitions of one of ordinary skill in the art are very similar. Accordingly, the ALJ finds that the evidence shows that a person of ordinary skill in the art of the asserted patents is a person with a bachelor of science degree in engineering (electrical, chemical or mechanical) and a few years of experience in electronic packaging field, or a person with an advanced degree in one of these fields and at least one year of experience in electronic packaging.

C. Asserted Claims

1. The '326 Patent

The asserted claims of the '326 patent in this investigation are claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29. Claim 1 is the only independent claim. The remaining claims at issue, claims 2, 6, 12, 16-19, 21, 24-26, and 29 depend either directly or indirectly from claim 1. *See* JX-1. The asserted claims read as follows:

> 1. A semiconductor assembly comprising:
>
> a semiconductor chip having oppositely facing front and rear surfaces and edges extending between said front and rear surfaces, said chip further having contacts on a peripheral region of said front surface;
>
> a backing element having electrically conductive terminals and lead portions thereon, wherein said lead portions are connected to said terminals, said backing element overlying said rear surface of said semiconductor chip such that at least some of said terminals overlie said rear surface of said chip;
>
> bonding wires connected to said contacts on said front surface of said chip, said bonding wires extending downwardly alongside said edges of said chip and being connected to the lead portions

on the backing element;

wherein said terminals are movable with respect to said chip.

2. The semiconductor assembly as claimed in claim 1, wherein said backing element includes a polymeric dielectric material.

6. The semiconductor assembly as claimed in claim 1, wherein said chip contacts define a first center-to-center distance between adjacent chip contacts and said terminals define a second center to center distance between adjacent terminals, said second center to center distance being larger than said first center to center distance.

12. The semiconductor assembly as claimed in claim 1, wherein:

a) said backing element has a top surface facing toward the chip and a bottom surface facing away from the chip; and

b) said lead portions and terminals are located on said bottom surface of said backing element.

16. The semiconductor assembly as claimed in claim 1, wherein said bonding wires are connected on at least one end by ultrasonic or thermosonic energy.

17. The semiconductor assembly as claimed in claim 1 or claim 4, further comprising a compliant layer disposed between said backing element and said rear surface of said chip to facilitate the movement of said terminals.

18. The semiconductor assembly as claimed in claim 17, wherein said compliant layer is comprised of a low-modulus material.

19. The semiconductor assembly as claimed in claim 17, wherein said compliant layer is disposed between said terminals and said chip.

21. The semiconductor assembly as claimed in claim 17, further comprising a dielectric encapsulant covering at least a portion of said bonding wires and at least a portion of said edges and said front surface of said chip.

24. The semiconductor assembly as claimed in claim 1, wherein said terminals are movable in a direction parallel to said rear surface of said chip.

25. The semiconductor assembly as claimed in claim 1 or claim 24, wherein the terminals are movable in a direction perpendicular to said rear surface of said chip.

26. The semiconductor assembly as claimed in claim 1, further comprising a dielectric encapsulant covering at least a portion of said bonding wires and at least a portion of said edges and said front surface of said chip.

29. The semiconductor assembly as claimed in claim 1, wherein said lead portions and said terminals are formed by photochemical etching or by electro-deposition techniques.

2. The '419 Patent

The asserted claims of the '419 patent in this investigation are claims 1-11, 14, 15, 19, and 22-24. Claims 1-8 are independent claims. Claims 9 and 12 are multiple dependent claims that depend from claims 1-4. Claims 10, 11, 19, and 22 are multiple dependent claims that depend from claims 1-8. Claim 14 is a multiple dependent claim that depends from claims 3, 4, 7 or 8. Claim 15 is a multiple dependent claim that depends from claims 1-9. Claim 23 depends from claim 22. Claim 24 is a multiple dependent claim that depends from 2, 4, 6, or 8. *See* JX-2.

The asserted claims read as follows:

1. A semiconductor assembly comprising: a) a semiconductor chip having a front surface, a rear surface and contacts on said front surface, said semiconductor chip having a coefficient of thermal expansion; b) a substrate adapted to physically support the chip and electrically interconnect the chip with other elements of a circuit, said substrate having a set of contact pads thereon, said substrate having a coefficient of thermal expansion, said semiconductor chip overlying said substrate so that said chip overlies at least some of said contact pads of said set and so that said rear surface of said chip faces toward said substrate and said contact pads; c) a backing element having electrically conductive terminals and electrically conductive lead portions electrically connected to said terminals and to said contacts on said chip, said backing element having a central region aligned with said chip and disposed between said rear surface of said chip and said substrate, said terminals of said backing element being bonded to said contact pads on said substrate, at least some of said terminals of said backing element being disposed in said central region of said backing element and being movable with respect to the chip to compensate for differential thermal expansion of the chip and substrate.

2. A semiconductor assembly comprising: a) a semiconductor chip having a front surface, a rear surface and contacts on said front surface, said semiconductor chip

having a coefficient of thermal expansion; b) a substrate adapted to physically support the chip and electrically interconnect the chip with other elements of a circuit, said substrate having a set of contact pads thereon, said substrate having a coefficient of thermal expansion, said semiconductor chip overlying said substrate so that said chip overlies at least some of said contact pads of said set and so that said rear surface of said chip faces toward said substrate and said contact pads; c) a backing element having terminals and having electrically conductive lead portions electrically connected to said terminals, said backing element having a central region aligned with said chip and disposed between said rear surface of said chip and said substrate, said terminals of said backing element being bonded to said contact pads on said substrate, at least some of said terminals of said backing element being disposed in said central region of said backing element and being movable with respect to the chip to compensate for differential thermal expansion of the chip and substrate; and d) bonding wires electrically connecting said contacts on said chip and said lead portions of said backing element.

3. A semiconductor assembly comprising: a) a semiconductor chip having a front surface, a rear surface and contacts on said front surface, said semiconductor chip having a coefficient of thermal expansion; b) a substrate adapted to physically support the chip and electrically interconnect the chip with other elements of a circuit, said substrate having a set of contact pads thereon, said substrate having a coefficient of thermal expansion, said semiconductor chip overlying said substrate so that said chip overlies at least some of said contact pads of said set and so that said rear surface of said chip faces toward said substrate and said contact pads; c) a backing element having terminals and having electrically conductive lead portions connected to said terminals, said backing element having a central region aligned with said chip and disposed between said rear surface of said chip and said substrate, at least some of said terminals of said backing element being disposed in said central region, and bonded to said contact pads on said substrate; and d) a compliant layer disposed between said rear surface of said chip and said backing element, said compliant layer facilitating movement of said terminals in said central region of said backing element with respect to the chip to compensate for differential thermal expansion of the chip and substrate.

4. A semiconductor assembly comprising: a) a semiconductor chip having a front surface, a rear surface and contacts on said front surface, said semiconductor chip having a coefficient of thermal expansion; b) a substrate adapted to physically support the chip and electrically interconnect the chip with other elements of a circuit, said substrate having a set of contact pads thereon, said substrate having a coefficient of thermal expansion, said semiconductor chip overlying said substrate so that said chip overlies at least some of said contact pads of said set and so that said rear surface of said chip faces toward said substrate and said contact pads; c) a backing element having terminals and having electrically conductive lead portions

connected to said terminals, said backing element having a central region aligned with said chip and disposed between said rear surface of said chip and said substrate, at least some of said terminals of said backing element being disposed in said central region and bonded to said contact pads on said substrate; d) bonding wires electrically connecting said contacts on said chip and said lead portions of said backing element; and e) a compliant layer disposed between said rear surface of said chip and said backing element, said compliant layer facilitating movement of said terminals in said central region of said backing element with respect to the chip to compensate for differential thermal expansion of the chip and substrate.

5. A semiconductor assembly comprising: a) a semiconductor chip having a front surface, a rear surface and contacts on said front surface, said semiconductor chip having a coefficient of thermal expansion; b) a substrate adapted to physically support the chip and electrically interconnect the chip with other elements of a circuit, said substrate having a set of contact pads thereon, said substrate having a coefficient of thermal expansion, said semiconductor chip overlying said substrate so that said chip overlies at least some of said contact pads of said set and so that said rear surface of said chip faces toward said substrate and said contact pads; c) a backing element having electrically conductive terminals and electrically conductive lead portions electrically connected to said terminals and to said contacts on said chip, said backing element having a central region aligned with said chip and disposed between said rear surface of said chip and said substrate, at least some of said terminals of said backing element being disposed in said central region of said backing element, said terminals in said central region of said backing element being engaged with said contact pads on said substrate, said terminals in said central region of said backing element being movable with respect to the chip to compensate for differential thermal expansion of the chip and substrate.

6. A semiconductor assembly comprising: a) a semiconductor chip having a front surface, a rear surface and contacts on said front surface, said semiconductor chip having a coefficient of thermal expansion; b) a substrate adapted to physically support the chip and electrically interconnect the chip with other elements of a circuit, said substrate having a set of contact pads thereon, said substrate having a coefficient of thermal expansion, said semiconductor chip overlying said substrate so that said chip overlies at least some of said contact pads of said set and so that said rear surface of said chip faces toward said substrate and said contact pads; c) a backing element having terminals and having electrically conductive lead portions electrically connected to said terminals, said backing element having a central region aligned with said chip and disposed between said rear surface of said chip and said substrate, at least some of said terminals of said backing element being disposed in said central region of said backing element, said terminals in said central region of said backing element being engaged with said contact pads on said substrate, said terminals in said central region of said backing element being movable with respect

to the chip to compensate for differential thermal expansion of the chip and substrate; and d) bonding wires electrically connecting said contacts on said chip and said lead portions of said backing element.

7. A semiconductor assembly comprising: a) a semiconductor chip having a front surface, a rear surface and contacts on said front surface, said semiconductor chip having a coefficient of thermal expansion; b) a substrate adapted to physically support the chip and electrically interconnect the chip with other elements of a circuit, said substrate having a set of contact pads thereon, said substrate having a coefficient of thermal expansion, said semiconductor chip overlying said substrate so that said chip overlies at least some of said contact pads of said set and so that said rear surface of said chip faces toward said substrate and said contact pads; c) a backing element having terminals and having electrically conductive lead portions connected to said terminals, said backing element having a central region aligned with said chip and disposed between said rear surface of said chip and said substrate, at least some of said terminals of said backing element being disposed in said central region of said backing element and engaged with said contact pads on said substrate; and d) a compliant layer disposed between said rear surface of said chip and said backing element, said compliant layer facilitating movement of said terminals in said central region of said backing element with respect to the chip to compensate for differential thermal expansion of the chip and substrate.

8. A semiconductor assembly comprising: a) a semiconductor chip having a front surface, a rear surface and contacts on said front surface, said semiconductor chip having a coefficient of thermal expansion; b) a substrate adapted to physically support the chip and electrically interconnect the chip with other elements of a circuit, said substrate having a set of contact pads thereon, said substrate having a coefficient of thermal expansion, said semiconductor chip overlying said substrate so that said chip overlies at least some of said contact pads of said set and so that said rear surface of said chip faces toward said substrate and said contact pads; c) a backing element having terminals and having electrically conductive lead portions connected to said terminals, said backing element having a central region aligned with said chip and disposed between said rear surface of said chip and said substrate, at least some of said terminals of said backing element being disposed in said central region of said backing element and engaged with said contact pads on said substrate; d) bonding wires electrically connecting said contacts on said chip and said lead portions of said backing element; and e) a compliant layer disposed between said rear surface of said chip and said backing element, said compliant layer facilitating movement of said terminals in said central region of said backing element with respect to the chip to compensate for differential thermal expansion of the chip and substrate.

9. An assembly as claimed in any of claims 1-4, further comprising solder masses

disposed between said terminals of said backing element and said contact pads of said substrate, said terminals of said backing element being bonded to said contact pads of said substrate by said solder masses.

10. An assembly as claimed in any of claims 1-8 wherein said coefficient of expansion of said substrate is different than the coefficient of expansion of said chip.

11. An assembly as claimed in any of claims 1-8 wherein said substrate is a circuit panel.

14. An assembly as claimed in claim 3 or claim 4 or claim 7 or claim 8 wherein said compliant layer incorporates an adhesive.

15. An assembly as claimed in any of claims 1-9, wherein: a) said backing element has a top surface facing toward the chip and a bottom surface facing away from the chip; and b) said lead portions and terminals are disposed at said bottom surface of said backing element.

19. An assembly as claimed in any of claims 1-8, wherein said chip contacts define a first center-to-center distance between adjacent chip contacts and said contact pads define a second center to center distance between adjacent contact pads, said second center to center distance being larger than said first center to center distance.

22. An assembly as claimed in any of claims 1-8, wherein said terminals are movable in a direction parallel to said rear surface of said chip.

23. An assembly as claimed in claim 22 wherein the terminals are movable in a direction perpendicular to said rear surface of said chip.

24. An assembly as claimed in claim 2 or claim 4 or claim 6 or claim 8, further comprising a dielectric encapsulant covering at least a portion of said bonding wires and at least a portion of said front surface of said chip.

D. Disputed Claim Limitations

1. "backing element" ('326 Patent - claims 1, 2, 12, 17) ('419 Patent - claims 1-9, 15)

Tessera argues that the proper construction of the term "backing element" is "an element that is generally sheet-like and underlies the rear surface of the chip." CIB at 10. Respondents argue that properly construed the limitation means "a flexible element that is generally sheet-like and

deformable to permit the movement required by the claim." RIB at 47. Similar to Tessera's proposed construction, the Staff argues that "backing element" should be construed as "a sheet-like material underlying the chip." SIB at 11.

Looking first to the claims, it is noted that independent claim 1 of the '326 patent explicitly states that the backing element "overl[ies] said rear surface of said semiconductor chip." JX-1 at 34:23-28. With regard to the '419 patent, independent claims 1-8 each require the backing element to be "disposed between said rear surface of said chip and said substrate" *See e.g.*, JX-2 at 34:32-43. Additionally, it is noted that dependent claim 3 of the '326 patent and dependent claim 18 of the '419 patent add a limitation requiring the backing element to be flexible. JX-1 at 34:23-28, 34:40-42; JX-2 at 38:22-25. Because claims 3 and 18 depend from claim 1 of the '326 patent and claims 1-8 of the '419 patent, under the doctrine of claim differentiation, it would be improper to limit the term backing element as recited in the independent claims to flexible materials. To do so would render claim 3 of the '326 patent and claim 18 of the '419 patent redundant and violate the presumption that every claim in a patent has meaning.

Turning to the specification, it is noted that the abstract of both patents state that the backing element "overl[ies] the bottom surface of the chip." *See e.g.*, JX-1 (abstract).[11] Additionally, Figures 21 and 22 show the backing element 932 as rectangular and sheet-like in form, which is further supported by the description in the specification. *See e.g.*, JX-1 at 26:32-37, Figures 21 and 22. The specifications also describe a preferred embodiment of the invention, stating that "[p]referably, the backing element and leads are flexible so that the terminals on the backing element are moveable

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[11] Because the '326 and '419 patents share a common specification, citations to the specification of the '326 patent are translatable to the '419 patent. Accordingly, citations will only be given to the '326 patent specification.

with respect to the chip." *See e.g.*, JX-1 at 7:52-54.

Respondents proposed claim construction requiring the backing element to be flexible and deformable to support the claimed movement is not supported by either the language of the claims or the specification. No independent claim of the '326 or '419 patents places any restriction on the type of material of which the backing element may be constructed. Moreover, the fact that dependent claims in the asserted patents require the backing element to be flexible, leads to the conclusion that the independent claims should not be so restricted. Additionally, while the specifications state that a flexible backing element may be preferred, nowhere in the specification does it states that it is required. Thus, to require the backing element in all instances to be flexible would be to impermissibly read a limitation from the dependent claims in the independent claims. Further, contrary to Respondent's proposed claim construction, there is nothing in either the specification or claims to suggest that the backing element must be deformable to support the claimed movement.

Accordingly, based on the language of the claims and the specifications of the '326 and '419 patents, the ALJ finds that one of ordinary skill in the art at the time of the invention would construe the limitation "backing element" as "a generally sheet-like element that underlies the rear surface of the chip."

2. "bonding wires extending downwardly alongside said edges of said chip" ('326 Patent - claim 1)

Tessera argues that the limitation "bonding wires extending downwardly alongside said edges of said chip" should be construed to require the bonding wires to lie to the side of the chip, with the caveat that one of ordinary skill in the art would understand that through the wire bonding process,

the wires may extend up, and then outward and downward to the backing element. CIB at 12. Respondents argue that properly construed the limitation requires "bonding wires extending from the top surface of the chip in the direction of the rear surface and in close proximity to the edges of the chip." RIB at 36. The Staff construes the limitation to mean "bonding wires that extend downwardly from the top surface of the chip to the backing element." SIB at 13.

Claim 1 of the '326 Patent discloses "bonding wires connected to said contacts on said front surface of said chip, said bonding wires extending downwardly alongside said edges of said chip and being connected to the lead portions on the backing element." JX-1 at 34:29-34. This claim language is unambiguous, plainly requiring the bonding wires to extend from the contacts on the front surface of the semiconductor chip in a downward direction along the side of the chip to the lead portions on the backing element. *See Philips*, 415, F.3d at 1314 (sometimes claim construction involves "little more than the application of the widely accepted meaning of commonly understood words."); *see also* Meriam Webster Online Dictionary ("downwardly" - 1: moving or extending downward; "alongside" - 2: at the side).

The bonding wires, which are described in the specification as conventional, are illustrated in Figures 14, 26, 29, and 30 of the'326 patent in a variety of configurations. *See* JX-1, Figure 14 (element 856), Figure 26 (element 974), Figure 29 (element 9395), Figure 30 (bonding wire is shown but not labeled). In each configuration, the bonding wires are shown as connecting two elements and extending from the point of contact with a first element upward, outward, and then downward toward the point of contact with a second element. According to the specification, "[d]uring the conventional wire bonding process, a bonding head is "moved while playing out the wire until it reaches the other element to be connected, whereupon the wire is bonded to such other element and

cut, leaving the wire in place." JX-1 at 29:32-35. Consistent with the figures in the specification, one of ordinary skill in the art would understand that the wire bonding process may cause the bonding wires to extend from the contacts on the chip up, outward, and then downward to the backing element. *See* CX-3196C (Qu, Wit. Stat.) at ¶ 99.

Respondents' proposed construction requires the bonding wires to be in close proximity to the edges of the chip although there is nothing in the specification to suggest that the applicants intended to equate "alongside" with "close proximity." Respondents' proposed construction also requires the bonding wires to extend from the top surface of the chip in the direction of the rear surface of the chip, but fails to provide any accommodation for conventional wire bonding processes that may cause the bonding wires to extend up and outward before extending downward. Respondents primarily rely on Figure 26 in support of their proposed claim construction. However, Figure 26 does not show bonding wires extending downwardly alongside the edges of the chip. Figure 26 only discloses short, conventional bonding wires 974, which terminate at the point where they connect to trace leads 948 above the face of the chip. *See* JX-1 at Figure 26. Moreover, limiting the claim construction to the singular embodiment shown in Figure 26 would violate the basic principal of claim construction that prohibits the details of individual embodiments to be imported into the claims. *See, e.g., Phillips*, 415 F.3d at 1323.

Accordingly, based on the language of the claims and the specifications of the '326 and '419 patents, the ALJ finds that one of ordinary skill in the art at the time of the invention would construe the limitation "bonding wires extending downwardly alongside said edges of said chip" as requiring the bonding wires to extend in a downward direction along the side of the semiconductor chip, with the caveat that one of ordinary skill in the art would understand that through the wire bonding

process, the bonding wires may extend up, outward and then downward toward the backing element.

3. "compliant layer" ('326 Patent - claims 17-19)('419 Patent - claims 3, 4, 7, 8, 14)

Tessera argues that the limitation "compliant layer" is properly construed to mean "a layer that yields to an applied force." CIB at 13. Respondents argue that the limitation should be construed as "a material that is appreciably compressible in a direction perpendicular to its surface." RIB at 53. The Staff argues that properly construed "compliant layer" means "a layer of compressible material." SIB at 21.

Turning first to the claims of the '326 patent, it is noted that claim 17 of the '326 patent requires "a compliant layer disposed between said backing element and said rear surface of said chip to facilitate the movement of said terminals." JX-1 at 35:33-36. Similarly, claims 3, 4, 7, and 8 of the '419 patent require "a compliant layer disposed between said rear surface of said chip and said backing element, said compliant layer facilitating movement of said terminals in said central region of said backing element with respect to the chip to compensate for differential thermal expansion of the chip and substrate." *See e.g.*, JX-2 at 35:30-35. Additionally, dependent claim 18 of the '326 patent requires that the "compliant layer [be] comprised of a low-modulus material," while dependent claim 14 of the '419 patent requires that the "compliant layer incorporates an adhesive." Contrary to Respondents' proposed claim construction, there is nothing in the plain language of the claims to suggest that a complaint material is only compliant in a direction perpendicular to its surface. In fact, as discussed in detail infra, the asserted patents make plain that the "movement" the compliant layer is supposed to facilitate can occur either perpendicular or parallel to the chip.

Having examined the language of the claims the specification is consulted. The specification

uses the term "compliant" idiosyncratically, thus connoting the breadth of the term. *Johnson Worldwide Assocs. v. Zebco Corp.*, 175 F.3d 985, 991 (Fed. Cir. 1999) ("[v]aried use of [this] disputed term in the written description demonstrates the breadth of the term[,] rather than providing a limited definition."). Specifically, the specification describes the "compliant layer" as being: (1) compressible (*see* JX-1 at 3:60-63 ("said complaint layer will be compressed upon movement of said terminals toward said chip")); (2) resilient (*see id.* at 8:4-6 ("[T]he assembly may include resilient means for permitting movement of the terminals towards the bottom surface but resisting such movement. For example, the assembly may incorporate a layer of a compliant material disposed between the chip rear surface and the terminals.")); (3) having a relatively low elastic modulus (*see id.* at 17:49-51 ("compliant bottom layer 840 formed from a material having a relatively low elastic modulus")); (4) flexible (*see id.* at 20:45-47 ("The interposer itself, and particularly the top layer 838 and bottom compliant layer 840 may be flexible.")); (5) soft (*see id.* at 22:17-19 ("Because the compliant layer is soft, the top layer will remain flexible even when bound to the chip through the compliant layer.")); and (6) elastic (*see id.* at 27:39-42 ("[A] resilient, compliant layer 964 (FIG. 25) formed from a relatively low elastic modulus material is provided in the lower or downwardly facing space 960 of box element 950. Preferably, this low-modulus material has elastic properties (including modulus of elasticity) comparable to those of soft rubber.")).

With regard to the Respondents' argument that a compliant material only permits movement in the direction perpendicular to its surface, the specification explicitly contradicts Respondents argument by making plain that the compliant layer permits both perpendicular and parallel movement. For example, the specification states that "a compliant layer is disposed between said terminals and said chip so that said compliant layer will be compressed upon movement of said

terminals toward said chip." JX-1 at 3:61-64. Additionally, the specification states that "[b]ecause the compliant layer is soft, the top layer will remain flexible even when bound to the chip through the compliant layer, and the terminals will still be movable with respect to the contacts in directional [sic] parallel to the face of the chip." JX-1 at 22:17-19. As for Tessera's proposed construction of "compliant layer" as "a layer that yields to an applied force," the record evidence shows that any material will yield to an applied force. *See* RX-2950C (Schaper,Wit. Stat.) at ¶ 326. Because any material will yield to an applied force, the ALJ finds Tessera's proposed construction too broad, ostensibly depriving the limitation of any particulized meaning. *See Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 1119 (Fed. Cir. 2004) ("While not an absolute rule, all claim terms are presumed to have meaning in a claim.").

Accordingly, based on the language of the claims and the specifications of the asserted patents, the ALJ finds that one of ordinary skill in the art at the time of the invention would construe the limitation "compliant layer" as a layer of flexible, compressible, and/or elastic material.

4. "terminals are moveable with respect to said chip" "terminals being moveable with respect to the chip to compensate for differential thermal expansion of the chip and substrate" "movement of said terminals to compensate for differential thermal expansion of the chip and substrate" ('326 Patent - claims 1, 17, 24, 25) ('419 Patent - claims 1-8, 22, 23)

Tessera and the Staff argue that the terms "moveable" and "movement" should be construed to mean that "in the operation of the assembly, the terminals are capable of being displaced relative to the chip by external loads applied to the terminals, to the extent that the displacement appreciably relieves mechanical stresses, such as those caused by differential thermal expansion which would

be present in the electrical connections absent such displacement."[12] CIB at 16; SIB at 16. Respondents do not set forth a proposed construction for the limitations "moveable" and "movement." Instead, Respondents contend that this limitation is indefinite under 35 U.S.C. § 112 ¶ 2.[13] RIB at 43.

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[12] Tessera provides little discussion in its post-hearing brief in support of its proposed claim construction. *See* CIB at 16. Tessera primarily relies on the claim construction rulings made in other cases involving either the patents at issue in this investigation or related patents. Specifically, Tessera argues that its proposed construction in this investigation "is consistent with constructions in the *Samsung*, *Texas Instruments*, and *Micron* litigations." *Id.* Because Tessera relies almost exclusively on these three cases, the Judges' holdings in each of these cases deserve further discussion.

In the *Texas Instruments* litigation, Judge Wilken adopted Tessera's proposed claim construction with little analysis. *See* CX-1654 (Claim Construction Order dated May 25, 2001) at 17-19. In the section of the claim construction order that addresses the limitation "moveable," Judge Wilken only focused on respondent's argument that the limitation was indefinite. *Id.* In the *Samsung* litigation, Judge Wilken again adopted Tessera's proposed construction with little analysis, noting only, and without citation, that the term "[m]ovable, in the context of the claims at issue, is a term of degree [and that] [t]he claim term means movable enough to appreciably relieve mechanical stresses." *See* CX-1646 (Claim Construction Order dated January 8, 2004) at 12-13. In the *Micron* litigation, Judge Love also adopted Tessera's proposed claim construction. *See* CX-1645 at 8-11. Judge Love reached his claim construction interpretation after a brief discussion of the claims, specification and prosecution history. *Id.* In that discussion, Judge Love noted that "[t]he plain language of both the claims and specifications describe the type of movement encompassed by the term 'moveable.'" *Id.* at 9. Judge Love also noted that "[d]uring prosecution of the '419 and '893 patents, Tessera assured the patent office that its technology solved the problem of strain due to thermal cycling in a different way than the Lin patent which relied upon CTE matching and deformable solder." *See id.* at 9-10.

[13] Respondents' claim of indefiniteness is discussed in more detail, *infra*, as part of Respondents' other invalidty contentions. *See infra*, at VII.D. While Respondents contend in their post hearing briefing that the limitation "moveable" is indefinite, and thus beyond construction, it is noted that Respondents seemingly had no difficulty in construing the limitation in their pre-hearing brief. In their pre-hearing brief, Respondents argued that properly construed the limitation "moveable" means that:

> in the operation of the assembly, the terminals are capable of being displaced relative to the chip by external loads applied to the terminals, to the extent that displacement appreciably relieves mechanical stresses, such as those caused by differential thermal expansion which would be present in the electrical connections absent such displacement. Movement that relieves mechanical stresses due to CTE matching is

Independent claim 1 of the '326 patent includes a limitation requiring that the "terminals are moveable with respect to said chip." *See* JX-1 at 34:18-36. Independent claims 1, 2, 5, and 6 of the '419 patent include a similarly-styled limitation that requires the "terminals being moveable with respect to the chip to compensate for differential thermal expansion of the chip and substrate." *See* JX-2 at 34:18-35:35, 36:1-59. Independent claims 3, 4, 7, and 8 of the '419 patent also include a similarly-styled limitation that requires the "movement of said terminals to compensate for differential thermal expansion of the chip and substrate." *Id.* at 35:7-67, 36:60-37:52. A plain reading of the above claim language does not reveal any express qualifications or restrictions on the "type" of terminal movement claimed. The only qualification placed on the terminal movement in the independent claims of the '316 and '419 patents is on the "quality" of the movement as the claim language expressly requires that the terminal movement compensate for the differential thermal expansion of the chip and substrate. Notably, there is nothing in the claims to suggest that the movement of the terminals should be limited to movement due to external loads.

Other claims of the asserted patents also support the conclusion that the terminal movement is not limited to any particular type of movement. For example, dependent claim 24 of the '326 patent and dependent claim 22 of the '419 patent, add a limitation explicitly requiring the terminal movement to be in a direction parallel to the rear surface of the chip (*i.e.*, horizontal movement).

> not the claimed movement. Furthermore, movement due to the expansion and contraction of the materials inside the chip package is not the claimed movement. However, displacement of the terminals relative to the chip by external loads applied to the terminals that appreciably relieves mechanical stresses is the claimed movement even in the presence of additional movement caused by inexact CTE matching.

RPHB at 39.

See JX-1 at 36:18-20; JX-2 at 38:40-42. Additionally, dependent claim 25 of the '326 patent and dependent claim 23 of the '419 patent, add a limitation explicitly requiring the terminal movement to be in a direction perpendicular to the rear surface of the chip (*i.e.*, vertical movement). *See* JX-1 at 36:21-23; see also JX-2 at 38:43-45. Thus, one would expect that independent claim 1 of the '326 patent (from which claims 24 and 25 depend) and independent claims 1-8 of the '419 patent (from which claims 22 and 23 depend) would be broad enough to cover both types of movement. *See Desper Prods., Inc. v. QSound Labs, Inc.*, 157 F.3d 1325, 1338 n.5 (Fed. Cir. 1998) (dependent claims are necessarily narrower than the independent claims from which they depend).

The specifications also elucidate the proper claim construction. With regard to the type of movement, the specifications support the notion, as expressed in the plain language of the claims, that there are no qualifications or restrictions on the type of claimed movement. In particular, the specifications confirm that some "displacement of the terminals toward the chip" and "movement of said terminals toward said chip" is expected and accounted for in the invention. JX-1 at 3:59-60, 3:63-64, 4:33-35. The specifications also confirm that the terminals may "move with respect to the chip in directions parallel to the chip surfaces," noting that such parallel movement provides compensation for the differential thermal expansion of the chip and substrate. JX-1 at 3:8-11.

Additionally, the specifications state with reference to the embodiment depicted in part by Figure 3 that:

> The contact end 56 of each lead 50 is moveable relative to the associated terminal 48. As best seen in Fig. 3, the contact end 56a of lead 50a can be displaced from its normal, undeformed position (shown in solid lines) in the directions parallel to the faces 44 and 46 of interposer 42 and parallel to the front face 38 of chip 28. For example, the contact end 56a may be displaced to the position indicated in broken lines at 56a'. This displacement is permitted by the flexibility of the lead 50 and by buckling and wrinkling of interposer 42. Encapsulant 60 is compliant, and does not

> substantially resist flexing of leads 50 and buckling and wrinkling of interposer 42. The displacement illustrated in FIG. 3, from the normal undisplaced position 56a to the displaced position 56a' places lead 50 in compression. That is, the terminal end 56a moves generally toward the associated terminal 48 in moving from position 56a to position 56a'. Movement in this direction is particularly well accommodated by buckling of the lead 50. The contact end of each lead can also move in other directions, such as in the opposite direction from position 56a away from the associated terminal 48, and in directions perpendicular to those directions, into and out of the plane of the drawing as seen in FIG. 3.

JX-1 at 11:19-41. The specifications' description of the "buckling and wrinkling" of the interposer upon which the terminals are located does not connote uniform movement, such as strictly horizontal or strictly vertical. Indeed, while the illustration of Figure 3 depicts movement parallel to the faces 44 and 46 of interposer 42 and parallel to the front face 38 of chip 28, the portion of the specifications quoted above states that the terminal end 56a moves *generally* toward the associated terminal 48 in moving from position 56a to position 56a'. In addition, the specifications teach that the movement depicted in Figure 3 is not the only movement that may occur or that the invention is designed to accommodate. The specifications explicitly state that "[t]he contact end of each lead can also move in other directions, such as in the opposite direction from position 56a away from the associated terminal 48, and in the directions perpendicular to these directions, into and out of the plane of the drawing as seen in FIG. 3."

With regard to the quality of the movement, the specification discusses the requirement that the terminal movement compensate for the differential thermal expansion of the chip and substrate in connection with an embodiment depicted in part in Figure 13 of the '326 and '419 patents. That embodiment discloses a sheetlike dielectric interposer that includes a flexible top layer and a compliant bottom layer. *See* JX-1 at 17:45-62. Specifically, the specification states:

> The interconnections-between the chip and the substrate (between peripheral contacts 830 and contact pads) are accommodated within the area of the chip itself, i.e., within the area on the substrate occupied by chip 820. Thus, no space on the surface of the substrate is wasted by a conventional "fan-out" pattern of interconnections. Moreover, the assembly is *substantially resistant to thermal cycling.* Each of the composite leads connecting one of the chip peripheral contacts and one of the central terminals 848 on the interposer is flexible. Thus, the partial leads 50 (FIG. 13) on the interposer surface itself preferably are flexible, and the fine bonding wires 856 are also flexible. The interposer itself, and particularly the top layer 838 and bottom compliant layer 840 may be flexible. Accordingly, there can be *substantial movement of terminals* 848 on the interposer relative to contacts 830 on the chip in directions parallel to the chip front surface. Such movement can be accommodated without applying substantial forces to the junctions between the leads and- the chip contacts. During use of the assembly, differential thermal expansion of chip 820 and substrate may cause appreciable displacement of the contact pads on the substrate relative to peripheral contacts 830 on the chip: Inasmuch as the central terminals 848 of the interposer are bonded to the contact pads of" the substrate by relatively, stiff noncompliant conductive masses, *the central terminals will tend to move with the contact pads.* However, such movement is readily accommodated and does not result in substantial stresses at the bonds between the central terminals and contact pads.

JX-1 at 20:34-62 (emphasis added). The patent specifications teach that differential thermal expansion of the chip and substrate may cause appreciable displacement of the contact pads on the substrate relative to peripheral contacts on the chip. The specifications also teach that the assembly is "substantially resistant" to thermal cycling. In this embodiment of the claimed invention, there can be "substantial movement" of the terminals on the interposer relative to contacts on the chip in directions parallel to the chip front surface, and the central terminals will "tend to move" with the contact pads. In the specifications, there is no indication that the terminals move to the same extent as the contact pads, in tandem with the contacts, or in a "fixed position" with respect to the contacts. Furthermore, the specifications teach that "substantial stresses" at the bonds between the central terminals and contact pads will be avoided. However, there is no teaching that the existence of "movable" terminals relieve all or substantially all of the stress.

Having analyzed the specification, the prosecution history is examined. In the original prosecution of the '419 patent, the patent examiner rejected the pending claims as anticipated by U.S. Patent No. 5,216,278 to Lin, stating among other things that:

> Although Lin teaches at least some of the terminals of the backing element being disposed in the central region of said backing element and being movable "resilient" "compliant" with respect to the chip, Lin does not appear to explicitly teach that the intended use of the movable terminals is to compensate for differential thermal expansion of the chip and substrate. Nevertheless, the statement of intended use does not result in a structural difference between the claimed product and the product of Lin. Further, because the product of Lin is inherently capable of being used for the intended use: the statement of intended use does not patentably distinguish the claimed product from the device of Lin. Similarly, the manner in which a product operates is not germane to the issue of patentability of the product; Ex parte Wikdahl 10 USPQ 2d 1546, 1548 (BPAI 1989); Ex parte McCullough 7 USPQ 2d 1889, 1891 (BPAI 1988); In re Finsterwalder 168 USPQ 530 (CCPA 1971); In re Casey 152 USPQ 235,238 (CCPA 1967). And, claims directed to product must be distinguished from the prior art in terms of structure rather than function. In re Danley, 120 USPQ 528, 531 (CCPA 1959). See also, Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990)
>
> In order to further clarify the teaching of compliant layer 20, it is noted that, as cited supra, Lin teaches that the layer is solder, and further teaches that solder is compliant.

JX-4 at pp. 183, 194, 195. Tessera distinguished the prior art Lin reference stating:

> As construed in the Official Action, the teaching of Lin is that the solder balls 26 must deform in order to accommodate differential movement of the terminal solder pads 34 with respect to the substrate. A teaching of deformable solder balls used to connect terminals to a substrate does not suggest the combination of claim 2, which includes terminals movable relative to the chip to compensate for differential thermal expansion and thus reduce the need for deformation in the solder balls or other bond between the terminals and the contact pads of the substrate. Indeed, Lin's teaching that one should rely upon deformable solder balls and CTE matching of the 'carrier substrate 12' and the printed circuit board as a full and adequate solution to the problem of solder joint fatigue leads away from any suggestion that one should provide terminals movable relative to the chip to deal with this problem.

JX-3, Amendment 8/20/01 at 4-5. Thus, in order to overcome the Examiner's rejection, Tessera distinguished solder ball deformation and CTE matching from the "claimed movement." This is

consistent with the position of Tessera's expert Dr. Qu in this investigation that terminal to chip displacement due to internal loads is not the claimed movement. *See* RX-3179C (Sitaraman, Wit. Stat.) at ¶ 89; RX-260C (Qu, Expert Report) at ¶¶ XIII.1 – XIII.3. It is also consistent with Dr. Qu's position in this investigation that relief of stress on solder balls resulting from displacement due to internal loads is not the claimed movement. *See* Qu, Tr. at 467:16-468:2.

While there is nothing in the plain language of the claims of the '326 and '419 patents, or their specifications, that suggests that the claimed terminal movement should be limited to movement due to external forces, Tessera does disavow solder deformation and CTE matching as the claimed movement in its statements in the prosecution history in overcoming the examiner's anticipation rejection to Lin. By disavowing solder deformation and CTE matching, Tessera ostensively limited itself to terminal movement due to external loads. Accordingly, based on the examination of the intrinsic record as detailed above, including the claims, specification and prosecution history, the ALJ finds that the limitations "terminals are moveable with respect to said chip," "terminals being moveable with respect to the chip to compensate for differential thermal expansion of the chip and substrate," and "movement of said terminals to compensate for differential thermal expansion of the chip and substrate" are properly construed as requiring that "in the operation of the assembly, the terminals are capable of being displaced relative to the chip by external loads applied to the terminals, to the extent that the displacement appreciably relieves mechanical stresses, such as those caused by differential thermal expansion which would be present in the electrical connections absent such displacement."

5. "substrate"
('419 Patent - claims 1-8)

Tessera argues that the limitation "substrate" does not need to be construed and that paraphrasing risks the unnecessary introduction of imprecision. CIB at 17. Respondents argue that "substrate" should be construed to mean "a substrate within the chip package." *See* CX-2783 at 3. The Staff argues that "substrate" is properly construed as "a substrate, such as circuit panel or circuit board." SIB at 25.

Looking first to the language of the claims, it is observed that claims 1-8 of the '419 patent requires "a substrate adapted to physically support the chip and electrically interconnect the chip with other elements of a circuit." *See, e.g.*, JX-2 at 34:23-31. Claims 1-8 also require that the substrate have "a set of contact pads thereon" and have "a coefficient of thermal expansion." *See, e.g.*, *id.* at 34:25-27. Contrary to Respondents' argument, the plain language of the claims do not suggest that the substrate must be part of the chip package. While the claims require the substrate to physically support the chip, the claims say nothing about whether the substrate has to "directly" support the chip. Moreover, dependent claim 11 of the '419 patent explicitly adds a limitation requiring that the substrate of claims 1-8 be a circuit panel. *See id.* at 37:62-63. Thus, pursuant to the doctrine of claim differentiation, one would expect that the term "substrate," as used in independent claims 1-8, is broad enough in scope that it may encompass a circuit panel.

Turning to the specification, it is noted that the specification expressly teaches that the substrate may be "a circuit board, circuit panel or hybrid circuit substrate." JX-2 at 20:28-33. Along the same lines, the '419 patent Abstract states that "[a] semiconductor chip is mounted in a face-up disposition, with a contact bearing front surface facing away from a substrate *such as a circuit*

panel." JX-2 at Cover Page. Similarly, the specification explains that "[t]he assembly incorporating the chip, interposer, terminals and leads may be incorporated in a larger assembly including a substrate having a top surface facing toward the second surface of the interposer." *Id.* at 5:18-21. Further, Figures 1 and 2 of the '419 patent show a chip package mounted to an external substrate. Specifically, Figure 1 illustrates two chip packages and a discrete component mounted to a substrate, while Figure 2 shows a side view of the chip and backing element mounted via solder balls to contact pads on the substrate. *See id.* at Figure 1, Figure 2; *see also id.* at 10:38-43.

Even Respondents' experts Drs. Schaper and Sitaraman testified that the term "substrate" refers to a printed circuit board. *See* Schaper, Tr. at 1437:7-13; Sitaraman, Tr. at 1027:11-1030:24.

The ALJ agrees with Tessera that the limitation "substrate" should be given its plain and ordinary meaning. The parties do not appear to dispute what a substrate is and paraphrasing risks the unnecessary introduction of imprecision. With regard to Respondents' argument that the substrate must be part of the chip package, the ALJ is unpersuaded. As discussed above, the claim language and specification make clear that the substrate may be external to the chip package.

VI. INFRINGEMENT DETERMINATION

A. Direct Infringement

1. Applicable Law

In a section 337 investigation, the complainant bears the burden of proving infringement of the asserted patent claims by a preponderance of the evidence. *Certain Flooring Products*, Inv. No. 337-TA-443, Commission Notice of Final Determination of No Violation of Section 337, 2002 WL 448690 at 59, (March 22, 2002); *Enercon GmbH v. Int'l Trade Comm'n,* 151 F.3d 1376 (Fed. Cir. 1998).

Each patent claim element or limitation is considered material and essential. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991). Literal infringement of a claim occurs when every limitation recited in the claim appears in the accused device, *i.e.,* when the properly construed claim reads on the accused device exactly. *Amhil Enters., Ltd. v. Wawa, Inc.*, 81 F.3d 1554, 1562 (Fed. Cir. 1996); *Southwall Tech. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed Cir. 1995).

If the accused product does not literally infringe the patent claim, infringement might be found under the doctrine of equivalents. The Supreme Court has described the essential inquiry of the doctrine of equivalents analysis in terms of whether the accused product or process contains elements identical or equivalent to each claimed element of the patented invention. *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 40 (1997).

Under the doctrine of equivalents, infringement may be found if the accused product or process performs substantially the same function in substantially the same way to obtain substantially the same result. *Valmont Indus., Inc. v. Reinke Mfg. Co.,* 983 F.2d 1039, 1043 (Fed. Cir. 1993). The doctrine of equivalents does not allow claim limitations to be ignored. Evidence must be presented on a limitation-by-limitation basis, and not for the invention as a whole. *Warner-Jenkinson*, 520 U.S. at 29; *Hughes Aircraft Co. v. U.S.*, 86 F.3d 1566 (Fed. Cir. 1996). Thus, if an element is missing or not satisfied, infringement cannot be found under the doctrine of equivalents as a matter of law. *See, e.g., Wright Medical*, 122 F.3d 1440, 1444 (Fed. Cir. 1997); *Dolly, Inc. v. Spalding & Evenflo Cos., Inc.*, 16 F.3d 394, 398 (Fed. Cir. 1994); *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538-39 (Fed. Cir. 1991); *Becton Dickinson and Co. v. C.R. Bard, Inc.*, 922 F.2d 792, 798 (Fed. Cir. 1990).

The concept of equivalency cannot embrace a structure that is specifically excluded from the scope of the claims. *Athletic Alternatives v. Prince Mfg., Inc.*, 73 F.3d 1573, 1581 (Fed. Cir. 1996). In applying the doctrine of equivalents, the Commission must be informed by the fundamental principle that a patent's claims define the limits of its protection. *See Charles Greiner & Co. v. Mari-Med. Mfg., Inc.*, 92 F.2d 1031, 1036 (Fed. Cir. 1992). As the Supreme Court has affirmed:

> Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole. It is important to ensure that the application of the doctrine, even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety.

Warner-Jenkinson, 520 U.S. at 29.

Prosecution history estoppel may bar the patentee from asserting equivalents if the scope of the claims has been narrowed by amendment during prosecution. A narrowing amendment may occur when either a preexisting claim limitation is narrowed by amendment, or a new claim limitation is added by amendment. These decisions make no distinction between the narrowing of a preexisting limitation and the addition of a new limitation. Either amendment will give rise to a presumptive estoppel if made for a reason related to patentability. *Honeywell Int'l Inc. v. Hamilton Sundstrand Corp.*, 370 F.3d 1131, 1139-41 (Fed. Cir. 2004), *cert. denied*, 545 U.S. 1127 (2005)(citing *Warner-Jenkinson*, 520 U.S. at 22, 33-34; and *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 733-34, 741 (2002)). The presumption of estoppel may be rebutted if the patentee can demonstrate that: (1) the alleged equivalent would have been unforeseeable at the time the narrowing amendment was made; (2) the rationale underlying the narrowing amendment bore no more than a tangential relation to the equivalent at issue; or (3) there was some other reason

suggesting that the patentee could not reasonably have been expected to have described the alleged equivalent. *Honeywell*, 370 F.3d at 1140 (citing, *inter alia*, *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 344 F.3d 1359 (Fed. Cir. 2003)(*en banc*)).

2. The '326 Patent

a. Claim 1

Tessera and the Staff argue that Respondents' accused products infringe the asserted claims of the'326 patent. *See* CIB at 20; SIB at 38. Not surprisingly, Respondents argue that the accused products do not infringe the '326 patent. RIB at 12. In particular, Respondents argue that Tessera has failed to prove by a preponderance of the evidence that the accused products practice the claimed movement, *i.e.*, terminal displacement relative to the chip by an outside force that appreciably relieves mechanical stresses. *Id.*; *see also, supra*, at V.D.4. Respondents also assert that the accused products do not have wire bonds extending downward alongside the chip, a backing element or a compliant layer. *Id.* at 36, 47. Further, Respondents argue that Tessera's modeling of representative packages does not satisfy Tessera's burden to show that all accused packages infringe. *Id.* at 7.

Tessera's proof of infringement for each of Respondents' accused products rests upon its detailed analysis of a subset of accused products from each Respondent, which it contends are representative of all of that particular Respondent's accused products. CX-3196C (Qu, Wit. Stat.) at ¶¶ 243-244. Respondents' contend that Tessera's analysis of these representative products does not satisfy Tessera's burden to show that all of Respondents' accused products infringe. However, the ALJ notes at the outset that there is nothing inherently wrong with relying on proof of infringement of a representative group of accused products to show infringement of all accused products. In fact, the Federal Circuit recently reaffirmed that it is appropriate for experts to select

and rely on representative products in forming their opinions. *See TiVo, Inc. v. Echostar Comm. Corp.*, 516 F.3d 1290, 1308 (Fed. Cir. 2008) ("[T]here is nothing improper about an expert testifying in detail about a particular device and then stating that the same analysis applies to other allegedly infringing devices that operate similarly, without discussing each type of device in detail."); *see also Union Carbide Chemical & Plastic Technology Corp. v. Shell Oil Company*, 425 F.3d 1366, 1376-1377 (Fed. Cir. 2005); *San Huan New Materials High Tech, Inc. v. International Trade Comm'n*, 161 F.3d 1347, 1359-60 (Fed. Cir. 1998). In choosing to rely on a group of allegedly representative products to prove infringement of all Respondents' accused products, Tessera has not relieved itself of its burden to show by a preponderance of the evidence that all the accused products infringe. Thus, inorder for Tessera to prove infringement of the non-representative products, Tesserra must show by a preponderance of the evidence that the representative products are indeed "representative" of all of Respondents' accused products. *See Lucent Technologies, Inc. v. Gateway, Inc.*, 543 F.3d 710, 723 (Fed. Cir. 2008) ("A patentee may rely on either direct or circumstantial evidence to prove infringement.").

Dr. Qu testified that a representative analysis of the accused products in this invetigation was appropriate because the class of accused products have similar properties. *See* CX-3196 (Qu, Wit. Stat.) at 242; Qu, Tr. at 538:16-539-4. In particular, the evidence shows that each of the accused products is a face-up, laminate substrate, BGA package with a die attach modulus of 3.5 GPa or less, a ball pitch of 1.2 mm or less, more than 36 solder balls, and at least one solder ball under the die. CX-3196C (Qu, Wit. Stat.) at ¶ 84; Qu, Tr. 431:17-432:17, 538:16-539-4. Even Respondents' expert Dr. Sitaraman acknowledged that the accused devices were similar in structure. RX-3179C (Sitaraman, Wit. Stat.) at ¶ 39.

Out of the over 1000 accused packages in this investigation, Dr. Qu relied on 52 representative products. Specifically, Dr. Qu selected seven packages from ATI, eight packages from Freescale, nine packages from QUALCOMM, nine from Spansion, and nineteen from ST-NV. *See* RX-260C (Qu, Expert Report) at pp. 191-192 (¶ XI.464.);[14] CX-3669C (Qu, Sup. Wit. Stat.) at ¶ 506. Dr. Qu selected the representative products based on: (1) whether a product had multiple dies or a single die; (2) the size of the largest die present in the product; (3) the pitch of the solder balls (which is closely related to the size and number of solder balls in the package); and (4) the elastic modulus of the die attach. Qu, Tr. at 535:12-536:16; CX-3669C (Qu, Sup. Wit. Stat.) at ¶ 454. According to the evidence of record, Dr. Qu chose the above criteria because those criteria would most directly affect relative terminal displacement. Qu, Tr. at 536:23-537:10. Based on the above criteria, the evidence shows that Dr. Qu selected "packages that have values...that are at or near the extremes among the pool of accused products and are therefore fairly representative of the entire pool of accused products." CX-3669C (Qu, Sup. Wit. Stat.) at ¶ 455; Qu, Tr. at 535:12-536:16.

Although Respondents argue that Tessera has failed to prove that the representative accused products chosen by Dr, Qu actually represent all of Respondents' accused products, Respondents have set forth little evidence to rebut Dr. Qu's selection process. Respondents argue that Dr. Qu did not substantiate that the packages he selected as representative were at or near the extremes. RRB at 17. However, the evidence shows Dr. Qu did list in his expert report the ranges of characteristics such as solder ball pitch, die size, and modulus of die attach that were covered by his representative products. *See* Qu, Tr. at 441:19-442:10; RX-260C (Qu, Expert Report) at IX.44-45, Exhibit 5; *see*

[14] Although Dr. Qu states at ¶ XI.464. that he analyzed 26 representative packages, he actually lists 42 packages.

also CPX-1C-6C. Respondents also argue that Dr. Qu did not explain why other factors that affect movement (such as mold compound thickness and substrate thickness) were excluded from his selection criteria. RRB at 18. However, contrary to Respondents' argument, Dr. Qu did in fact explain why he did not use additional criteria, stating that:

> there is a line that you have to draw. That is the more criterion that you use and the more parameters that you use, then the more products that you have to select. You know that. If you have to select 10 different ranges, then the product list will be very large. So that's beyond my ability to analyze them in a timely manner.
>
> More importantly, more importantly, the field that I selected I believe have the most sort of impact. And the others I would say, if they do have an effect, will be secondary.

Qu, Tr. at 537:4-14. The fact is, for all of Respondents' complaints regarding Dr. Qu's selection of representative products, Respondents never put forth any specific evidence that the criteria Dr. Qu chose to select the representative accused products would not be representative of all Respondents' accused products. Nor did Respondents present any evidence that any of Respondents' accused products not selected by Dr. Qu would behave differently than those selected as representative products.

As detailed above, the ALJ finds Dr. Qu's approach in selecting representative accused products reasonable and well thought out. By selecting representative products that span the range of values for those parameters that most directly affect the claimed movement, Dr. Qu has offered specific and substantial evidence as to why those accused products not selected by Dr. Qu can reasonably be expected to behave like the representative accused products.

Perhaps the most contentious aspect of Tessera's infringement allegations revolves around the limitation of claim 1 of the '326 patent requiring the terminals to be moveable with respect to the semiconductor chip. *See* JX-1 at 34:35-36. As properly construed herein, the limitation

"wherein said terminals are moveable with respect to said chip" requires that "in the operation of the assembly, the terminals are capable of being displaced relative to the chip by external loads applied to the terminals, to the extent that the displacement appreciably relieves mechanical stresses, such as those caused by differential thermal expansion which would be present in the electrical connections absent such displacement." *See*, *supra*, at V.D.4. Therefore, to prove that the claimed movement is present in the representative accused products, Tessera must show that: (1) the terminals are capable of being displaced with respect to the chip by external loads; and (2) the displacement caused by the external loads appreciably relieves mechanical stresses.[15]

To determine whether the representative accused products have the claimed movement, Dr. Qu compared the results of his finite element analysis ("FEA") modeling[16] of the actual package of

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[15] Although Tessera's expert Dr. Qu made clear during his testimony at the hearing in this investigation that he believed the "claimed movement" required a showing both that the terminals move relative to the chip due to external loads and that such movement by the terminals due to external loads must appreciably relieve mechanical stresses, in his Witness Statement, Dr. Qu appears to misapply the claim construction adopted herein by failing to consider whether the appreciable relief of stresses is caused by the movement of the terminals due to *external loads*. *Compare* Qu, Tr. at 467:16-468:2 *with* CX-3196C (Qu, Wit. Stat.) at ¶ 282.

[16] Finite element analysis is a general procedure of conducting simulations using digital computers to simulate the behavior of structures such as any electronic package. *See* CX-3196C (Qu, Wit. Stat.) at ¶ 151. The evidence shows that FEA modeling is a well accepted tool used in the semiconductor packaging industry. *See* CX-3196C (Qu, Wit. Stat.) at ¶ 158; Qu, Tr. at 515:22-25; RX-3179C (Sitaraman, Wit. Stat.) at ¶ 338; Sitaraman, Tr. at 1021:2-6; JX-0256C at 51, 52, 55:2-56:2, 62-65 ; JX-0239C at 128-29; CX-1155C; JX-0268C at 211-19, 229-234; JX-0245C at 248-51; JX-0257C at 133:25-135:16, 141:21-23; JX-0238C at 164, 153:8-154:19.

While FEA modeling is well accepted and used throughout the electronic and other industries, its use in industry does not prove that it is a proper tool for evidentiary matters in a hearing. When used in industry, the model can predict reliability, and model the differences in a variety of physical materials. Generally speaking, the modeler is looking to confirm reliability in the item modeled, and is not as concerned with which specific components may be responsible for the improvement. For example, if one device is far more reliable with the use of material "A" rather than "B", the modeler is satisfied, and the FEA analysis will result in an improved product. In this investigation, however, the concern is with a very specific issue; that is if the terminal movement

each representative accused product with a corresponding hypothetical "baseline" package.[17] CX-3196 (Qu, Wit. Stat.) at ¶ 253. Dr. Qu testified that it was necessary to create a baseline package for each of the actual packages modeled in order to isolate the claimed movement, *i.e.*, the terminal movement due to external loads that appreciably relieves mechanical stresses, from other types of movement that may otherwise be present in the chip assembly absent theclaimed movement. *Id.* at ¶¶ 254, 256; Qu, Tr. at 541:20:542:3. According to Dr. Qu, a baseline package must be identical to the actual package modeled in every aspect except that the baseline package does not have the claimed movement. Qu, Tr. at 430:2-7. Dr. Qu testified that in order to create a baseline package without the claimed movement, he replaced the compliant die attach material of the actual packages with silicon and the compliant solder mask material with package substrate core material. CX-3196 (Qu, Wit. Stat.) at ¶¶ 256, 257. Of course, it is important to remember that Dr. Qu is only working with a computer model so he did not really replace anything. Rather, he simply directed which numeric values are inputted into a complex computer algorithm. Thus, when Dr. Qu states he replaces the compliant die attach with silicon, he is really replacing the values associated with the die attach, such as its modulus of elasticity, with the values associated with silicon.

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due to external loads results in an appreciable relief of stress in the solder balls. *See*, *supra*, V.D.4. Unless the terminal movement due to external loads is isolated, or quantified, merely finding that a change in physical properties in one model produces better results is not the end of the inquiry, but rather the beginning. If there is an improvement, and it produces more reliability, the model must continue to be examined to insure that the reason for the improvement is the "claimed movement," and not some other reason or a combination of factors. So, even though FEA modeling is a valid method to examine material products, it will not necessarily produce a result that is valid in this hearing. If the claimed movement is not isolated, or quantified, we may be unable to reach a conclusion based on the modeling.

[17] Each of the actual packages and corresponding baseline packages were modeled "on-board," meaning that the package was modeled as being attached to a PCB.

By replacing the compliant die attach material and the compliant solder mask material with much stiffer materials, Dr. Qu modified the actual package in several significant ways.[18] First, as Dr. Qu admits, the CTE of the baseline package over all will be different than that of its corresponding actual package. Qu, Tr. at 447:23-448:2. Additionally, because the glass transition temperature for silicon is different than it is for the compliant die attach it replaced, the CTE of the baseline package will function differently from that of the actual package over the full temperature range during thermal cycling. Further, as recognized in the patents at issue, because Dr. Qu effectively binds the semiconductor chip to the package substrate on which it is mounted, the baseline package will be subject to chip damage, delamination and other internal problems that impact reliability. *See, e.g.*, JX-1 at 2:4-19; *see also* CX-3205C (Ivey, Wit. Stat.) at ¶ 259; RX-2950C (Schaper, Wit. Stat.) at ¶ 231.

By contrast, the compliant layers in the actual package (*i.e.*, the compliant die attach material and compliant solder mask material) act to decouple the chip from the package substrate allowing the package substrate to move more than it would if it were bound to the chip. *See* Complaint at ¶ 18. This allows the CTE of the package substrate to more closely match that of the PCB thereby improving reliability. *Id.; see also* RX-2950C (Schaper W.S.) ¶ 244, 260. Thus, by replacing the compliant layers in the actual package with much stiffer materials in the baseline, Dr. Qu. made each baseline package artificially stiffer than the actual package, thereby guaranteeing that the baseline package would show less terminal to chip displacement under application of the same load than that of its corresponding actual package. *See* RX-3179C (Sitaraman, W.S.) ¶¶ 190, 402.

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[18] Both silicon and BT resin are much stiffer than actual die attach or solder mask (*e.g.*, silicon has a modulus of elasticity 40 times that of die attach, and BT resin's modulus is 10 times that of solder mask). *See* Qu, Tr. at 446:18-447:8, 447:9-22.

Although Dr. Qu testified that a baseline package *must* be identical to the actual package modeled in every aspect except that the baseline package does not have the claimed movement, the reality is that Dr. Qu's baseline models do not just prevent the claimed movement, but also prevent, at least in part, the ability of the package substrate to move according to its CTE. *See* Qu, Tr. at 430:2-7. By replacing the compliant layers in the baseline package with stiffer materials, Dr. Qu altered the material properties of the chip package, including its CTE. Because Dr. Qu has no way to quantify the amount of claimed movement in the baseline model or how much the CTE of the chip package has changed, Dr. Qu cannot determine from his plastic work calculations what portion of the answer is due to the "claimed movement" and what portion is do to the change in the physical properties of the chip package (*i.e.*, the CTE of the baseline). While Tessera is correct when they argue that they do not have the burden to prove that any change in the amount of displacement seen between the baseline package and the actual package is entirely due to the claimed movement, Tessera must prove that there is at least some "claimed movement." Tessera also must prove that the "claimed movement" is what is providing appreciable relief to the stress on the solder balls. As Dr. Qu cannot demonstrate what, if any of the differences between the packages is attributable to "claimed movement," Dr. Qu cannot demonstrate that the claimed movement has provided appreciable relief to the stress on the solder balls.

In addition to the modeling and analysis described above, Dr. Qu conducted other testing in an effort to show that all of the representative accused chip packages have terminals that are movable relative to the chip due to external loads. *See* CX-3196C (Qu, Wit. Stat.) at ¶ 283. In particular, Dr.

Qu testified that he compared the off-board[19] and on-board[20] behavior of the representative accused packages during thermal cycling to estimate the amount of displacement due to external forces. To compare the on-board and off-board behavior of the representative accused chip packages, Dr. Qu testified that he had to assume that all the materials in the system behave in a linear way. CX-3196C (Qu, Wit. Stat.) at ¶¶ 283-85; Qu, Tr. 462:14-19; 472:19-473:13. Dr. Qu referred to this assumption as a "linearity assumption." CX-3196C (Qu, Wit. Stat.) at ¶ 284. Of course in reality,

> deformation of the on-board package is nonlinear due to the nonlinear stress-strain relationship in the solder balls. For nonlinear systems, there is an interaction between the internal loads and external loads. In other words, the movement in the on-board package (when both internal and external loads are applied) is not exactly the sum of the movements due to internal and external loads alone when they are separately applied.

RX-260 (Qu, Expert Report) at ¶ XIII.B.4. Dr. Qu never quantifies the margin of error inherent in his analysis resulting from his assumption that the system will behave linearly. Nor does Dr. Qu provided any basis for determining how different the actual behavior of the package would be from the model. Without some way of understanding the difference between the assumed behavior and the actual behavior of the system, the injection of this methodology into the hearing provides obfuscation rather than clarity.

Dr. Qu testified that modeling the representative accused packages off-board isolates the displacement of the terminals due to internal loads because the PCB is what generates the external loads. *See* RX-260C (Qu, Expert Report) at ¶¶ XIII.1-XIII.3; Qu, Tr. at 456:15-18; RX-3179C

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[19] In an off-board configuration the representative accused packages are modeled without being attached to a PCB. *See* RX-3179C (Sitaraman, Wit. Stat.) at ¶ 88; CX-3196 (Qu, Wit. Stat.) at ¶ 285.

[20] In an on-board configuration the representative accused packages are modeled as if attached to a PCB. RX-260C (Qu, Expert Report) at ¶¶ XIII.1-XIII.3; RX-3179C (Sitaraman Wit. Stat.) at ¶ 89.

(Sitaraman Wit. Stat.) at ¶¶ 88, 89. Dr. Qu testified that in an on-board configuration the representative accused packages are subject to both internal and external loads. RX-260C (Qu, Expert Report) ¶¶ XIII.1-XIII.3; RX-3179C (Sitaraman Wit. Stat.) ¶ 89. Accordingly, by subtracting the displacement seen in the on-board configuration from that seen in the off-board configuration, Dr. Qu testified that he could estimate the terminal displacement due to external loads. CX-3196 (Qu, Wit. Stat.) at ¶¶ 285.

While Dr. Qu refers to the movement of the chip package off-board as movement due to "internal loads," it is not really an accurate description of the movement of the chip package off-board. A more accurate description would be to describe the movement of the terminals off-board as movement due to the CTE of the package substrate to which the terminals are attached. The use of the word load is misleading in this instance, because with respect to the terminal or solder ball, there is no load off-board, however, there is movement. When the substrate and terminals are attached to a PCB, this movement (*i.e.*, the movement of the terminals due to the package substrate's CTE) could either relieve stress that would otherwise be on the solder ball, it could cause stress on the solder ball, or it could keep the stress level neutral, depending on the package substrate's movement relative to that of the PCB.

Although Dr. Qu alleges, as described above, that by comparing the on-board and off-board behavior of the representative accused chip packages he can determine the terminal displacement due to external loads, the actual methodology used by Dr. Qu cannot reach such a conclusion. This is the case because Dr. Qu does not measure the displacement at the terminals as required by the claim construction adopted herein, but rather measures the displacement at the bottom of the solder balls. *See* RX-3179C (Sitaraman, Wit. Stat.) ¶¶ 268-269; RX-260C (Qu, Expert Report) at ¶¶ XIII.3-

XIII.4; Qu, Tr. at 476:20-477:23, 478:4-11. By measuring the displacement at the bottom of the solder balls, Dr. Qu guarentees that the amount of displacement he calculates due to external loads is greater than what would actually be if he measured the displacement at the terminals. *See* RX-3179 (Sitaraman, Wit. Stat.) at ¶ 271. Notably, the evidence shows that Dr. Qu could have chosen to measure the displacement at the terminals, but for whatever reason chose not to. *Id.* at 275 ("Indeed, Dr. Qu's models provided information that would have allowed him to examine terminal to chip movement, but he didn't do it. I extracted such terminal to chip movement data from Dr. Qu's models.").

Looking at the actual terminal-to-chip displacement data from Dr. Qu's FEA on-board and off-board models of the representative accused packages, it is clear that for most of the representative accused chip packages Dr. Qu observed greater terminal-to-chip displacement when the packages were off-board rather than on-board. *See* RX-3483C; RX-3482C; *see also* RFF.IV.103 (admitted). For those few packages that showed greater displacement on-board than off-board, the differences were negligible, and well within the margin of error of Qu's analysis. *Id.* Based on this data, Dr. Qu's methodology cannot show that any observed displacement is actually due to external loads and not due to CTE matching, which Tessera admits is not the claimed movement. Even if there were some claimed movement, without determining how much of the total movement is due to CTE matching, Dr. Qu's computation of the improved life cycle of the package due to "claimed movement" is flawed and cannot demonstrate that Tessera's invention is providing any improved reliability, much less an *appreciable* increase in reliability. While Tessera does not bear the burden of demonstrating precisely how much of the movement may be claimed movement, Tessera does have the burden of demonstrating that if there is some claimed movement present the magnitude of

that movement is great enough to appreciably relieve stress due to external loads. For the reasons discussed above, the ALJ finds that Tessera has failed to make such a showing.

Tessera argues that only a displacement of the terminals in response to external loads can operate to reduce stress in the solder joint. CRB at 10. This is patently false. While the PCB may expand more than the chip and chip package substrate, stress relief can also come from the movement of the package substrate as it thermal cycles, which Dr Qu characterized as movement due to internal loads. In fact, Tessera's expert Dr. Qu acknowledges that when a package is attached to a PCB and heated, the package is still subjected to the same "internal loads," but in addition there are external loads applied to the terminals by the PCB through the solder balls. *See* CX-3196 (Qu, Wit. Stat.) at ¶ 285; *see also id.* at ¶ 51("Because of the differential thermal expansion between the effective CTE of the package and the CTE of the PWB, the top and the bottom of the solder balls are displaced differently when temperature changes."). Moreover, Dr. Qu admitted at the hearing that using a package substrate material with a coefficient of thermal expansion that is the same or similar to that of the PCB, the package substrate and PCB will expand and contract together because their CTE values are matched, "which reduces the strain on the solder balls." Qu, Tr. at 427:7-15; *see also* RX-285C at 3:15-22 ("One may reduce the loads on the solder balls by designing the package so that the effective CTE of the package substrate matches that of the PCB. In such a design, there is no differential thermal movement of the PCB relative to the package substrate and, therefore, no external loads applied to the package terminals."). Accordingly, the ALJ finds Tessera's argument unpersuasive.

Dr. Qu testified that after he determined the amount of displacement due to external loads from his on-board, off-board analysis for each of the representative accused packages, he then

computed the stresses and strains in each representative accused package due to those external loads. *See* RX-260C (Qu, Expert Report) at ¶¶ XIII.D, XIII.E; CX-3196 (Qu, Wit. Stat.) at ¶ 289. Specifically, Dr. Qu testified that he applied the displacement he computed due to external loads to off board models of both the actual and baseline packages for each of the representative accused products. *Id.* Dr. Qu testified that he then computed and compared the plastic work in both packages and found that the plastic work in the actual packages was less than that of the baseline. *Id.*

The fact that Dr. Qu found that the actual packages showed less plastic work than their corresponding baseline packages is not surprising because as discussed, *supra*, Dr. Qu removes the compliant layers that are present in the actual packages when he models his baseline packages thereby making his baseline packages artificially stiffer than they would normally be, changing both the CTE of the package substrate and the "claimed movement", if any. *See* RX-3179 (Sitaraman, Wit. Stat.) at ¶ 273. By making the baseline packages stiffer than they ought be, Dr. Qu guarantees that by comparison the actual packages will show an increase in reliability because the compliant layers in the actual package act to decouple the chip from the package substrate allowing the package substrate to move more than it would if it were bound to the chip. *Id.* at at ¶ 274. Because of the flaws in Dr. Qu's modeling, the ALJ finds that Tessera has failed to prove that any decrease in plastic work seen in the actual representative accused packages is the result of external loads as required by the claim construction adopted herein.

To validate his FEA modeling to further support his allegation that the representative accused chip packages show the claimed movement, Dr. Qu conducted moire tests to analyze the representative accused products. CX-3196 (Qu, Wit. Stat.) at ¶ 149. Moiré testing is an

experimental technique used for validating a finite element model in which a grating with very fine lines is epoxied to an actual sample. RX-3179C (Sitaraman, Wit. Stat.) at ¶ 307. Optical measurements using laser beams are then made on that sample at different temperatures to measure the displacements at various points on the package. *Id.* The moiré testing produces a series of moiré fringes that can be related to the displacement of the sample. CX-3196C (Qu, Wit. Stat.) at ¶ 208.

Although Dr. Qu testfied that the results of his moire testing validated his FEA modeling, that conclusion is not supported by the evidence. The moire testing Dr. Qu performed is incapable from distinguishing claimed movement from movement due to internal forces. Thus, the fact that the moire testing may have produced similar results to that seen in Dr. Qu's FEA models, does not provide any evidence that there is claimed movement. Additionally, Dr. Qu admitted at the hearing that he did not perform the moiré analysis over the full temperature range he modeled. Qu, Tr. at 492:14-20; RX-3179C (Sitaraman Wit. Stat.) at ¶¶ 311-312; RX-260C (Qu, Expert Report) at ¶¶ IX.8-IX.10, IX.37. However, according to the evidence of record, to properly validate an FEA model, the moire analysis must be performed over the same temperature range as the model. RX-3179C (Sitaraman Wit. Stat.) at ¶¶ 164, 308, 310-312, 316.

Accordingly, for the reasons discussed above, the ALJ finds that Tessera has failed to prove that any of the representative accused packages, and thus any of Respondents' accused products, have the "claimed movement." Because Tessera has failed to show that the accused products practice each and every limitation of claim 1 of the '326 patent, the ALJ finds that Tessera has failed to prove that Respondents' accused products infringe independent claim 1 of the '326 patent.

b. Claims 2, 6, 12, 16-19, 21, 24-26, 29

The ALJ has found herein that Tessera has failed to prove by a preponderance of the evidence that claim 1 of the '326 patent infringes any of Respondents' accused devices. Because independent claim 1 does not infringe, the ALJ finds dependent claims 2, 6, 12, 16-19, 21, 24-26, and 29 also do not infringe. *See Monsanto Co. v. Syngenta Seeds, Inc.*, 503 F.3d 1352, 1359 (Fed. Cir. 2007) (quoting *Wahpeton Canvas Co., Inc. v. Frontier, Inc.*, 870 F.2d 1546, 1552 (Fed.Cir.1989) ("One who does not infringe an independent claim cannot infringe a claim dependent on (and thus containing all the limitations of) that claim.")).

3. The '419 Patent

a. Claims 1-8

Independent claims 1-8 of the '419 patent include limitations requiring "terminals being moveable with respect to the chip to compensate for differential thermal expansion of the chip and substrate" and "movement of said terminals to compensate for differential thermal expansion of the chip and substrate." These limitations have been construed the same as the limitation of claim 1of the '326 patent requiring that the "terminals are moveable with respect to said chip." *See*, *supra*, at V.D.4. Accordingly, for the same reasons discussed in detail above with regard to claim 1 of the '326 patent, the ALJ finds that Tessera has failed to prove that any of the representative accused packages, and thus any of Respondents' accused products, have the "claimed movement." Because Tessera has failed to show that the accused products practice each and every limitation of claims 1-8 of the '419 patent, the ALJ finds that Tessera has failed to prove that Respondents' accused products infringe independent claims 1-8 of the '419 patent.

b. Claims 9-11, 14, 15, 19, 22-24

The ALJ has found herein that Tessera has failed to prove by a preponderance of the evidence that claims 1-8 of the '419 patent infringe any of Respondents' accused devices. Because independent claims 1-8 do not infringe, the ALJ finds dependent claims 9-11, 14, 15, 19, and 22-24 also do not infringe. *See Monsanto Co. v. Syngenta Seeds, Inc.*, 503 F.3d 1352, 1359 (Fed. Cir. 2007) (quoting *Wahpeton Canvas Co., Inc. v. Frontier, Inc.*, 870 F.2d 1546, 1552 (Fed.Cir.1989) ("One who does not infringe an independent claim cannot infringe a claim dependent on (and thus containing all the limitations of) that claim.")).

B. Indirect Infringement

Although Tessera argues in their post-hearing reply brief that it has submitted substantial evidence of indirect infringement of the patents in suit, the fact is Tessera did not set forth any argument in its initial post-hearing brief that Respondents' accused products indirectly infringe the asserted '326 and '419 patents. That some of Tessera's findings of fact may address issues relating to indirect infringement does not satisfy Tessera's obligations under Ground Rule 11.1 to set forth its argument relating to those facts in its initial post-hearing brief. Accordingly, pursuant to Ground Rule 11.1, the ALJ finds that Tessera has waived any argument that the accused products indirectly infringe the '326 or '419 patents. *See* Order No. 11 (October 30, 2007). Tessera's waiver of its indirect infringement allegations is of significance in this investigation, because Tessera admits that Respondents' accused standalone packages cannot directly infringe the '419 patent because the "substrate" required by the claims of that patent refer to a PCB. CRB at 15-16. Thus, by Tessera's own admission, the only way Tessera could have proven the accused standalone products infringe the asserted claims of the '419 patent is by proving that they indirectly infringe the '419 patent.

Even if Tessera had not waived its indirect infringement allegations, to prevail on a claim of indirect infringement Tessera must first prove that the asserted claims of the '326 and '419 patents have been directly infringed. *Dynacore Holdings Corp. v. U.S. Philips Corp.*, 363 F.3d 1263, 1272 (Fed Cir. 2004) ("Indirect infringement, whether inducement to infringe or contributory infringement, can only arise in the presence of direct infringement."); *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1326 (Fed. Cir. 2004) ("There can be no inducement or contributory infringement without an underlying act of direct infringement."). However, as discussed in detail, *supra*, the ALJ finds that Tessera has failed to prove direct infringement of the accused products under any of the asserted claims of the '326 and '419 patents. *See, supra*, at VI.A.2. Therefore, for this additional reason, the ALJ finds that Tessera has failed to prove that any of Respondents' accused products indirectly infringe the asserted claims of the '326 and '419 patents.

VII. VALIDITY

A patent is presumed valid. 35 U.S.C. § 282; *DMI Inc. v. Deere & Co.*, 802 F.2d 421 (Fed. Cir. 1986). The party challenging a patent's validity has the burden of overcoming this presumption by clear and convincing evidence. *Richardson-Vicks, Inc. v. Upjohn Co.*, 122 F.3d 1476, 1480 (Fed. Cir. 1997) (quoting *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 716 (Fed. Cir. 1991)); *Checkpoint Systems, Inc. v. United States Int'l Trade Comm'n*, 54 F.3d 756, 761 (Fed. Cir. 1995). Because the claims of a patent measure the invention at issue, the claims must be interpreted and given the same meaning for purposes of both validity and infringement analyses. *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001). The invalidity analysis involves two steps: the claim scope is first determined and then the properly construed claim is compared with the prior art to determine whether the claimed invention is anticipated and/or rendered obvious. *Id.*

A. Priority Date Of The '326 Patent and '419 Patent

Tessera argues that the asserted claims of the '326 and '419 patents are entitled to a priority date of June 10, 1990. CIB at 44. Tessera argues that both Dr. DiStefano and Dr. Bottoms testified that conception of a face-up chip assembly having all of the claimed elements occurred sometime in early June, 1990. *Id.* Tessera argues that Dr. Khandros' June 1, 1990 and June 10, 1990 notebook entries, among other entries, corroborate DiStefano's and Bottom's testimony regarding conception of a face-up chip assembly having all the claimed elements. Tessera argues that Dr. DiStefano and Dr. Khandros validated the notebook entries by having the notebook entries written by one person and witnessed by another person. *Id.*

Respondents argue that the combination of notebook entries relied on by Tessera do not corroborate the testimony of DiStefano and Bottoms. RIB at 64. Specifically, Respondents argue that the June 1, 1990 notebook entry cannot support Tessera's proposed date of conception, because Tessera's expert Dr. Ivey admitted that the disclosed [ ] is not a chip package as that term is used in the asserted patents. *Id.* at 65. Respondents also argue that the June 1, 1990 and June 10, 1990 notebook entries discuss unrelated issues and thus cannot be combined. *Id.* Moreover, Respondents argue that even if the entries could be combined, the notebook entries do not show the "completed invention." *Id.*

The Staff argues that Tessera has established a June 10, 1990 priority date for both patents at issue. SIB at 66. In particular, the Staff argues that Tessera established through the testimony of one inventor Dr. DiStefano, and a notebook written by the other inventor Dr. Khandros, that the asserted claims of the '326 and '419 patents were conceived of at least as early as June 10, 1990 and that the invention was reduced to practice without delay. *Id.*

"Conception is the 'formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice.'" *Shum v. Intel Corp.*, 499 F.3d 1272, 1277 (Fed. Cir. 2007) (citation omitted). "Conception is complete when the idea is so clearly defined in the inventor's mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation." *Stern v. Trustees of Columbia University in City of New York*, 434 F.3d 1375, 1378 (Fed. Cir. 2006) (internal quotations omitted). An idea is sufficiently definite for conception "when the inventor has a specific, settled idea, a particular solution to the problem at hand, not just a general goal or research plan he hopes to pursue." *Invitrogen Corp. v. Clontech Labs., Inc.*, 429 F.3d 1052, 1072-73 (Fed. Cir. 2005). If an inventor's oral testimony is relied upon for conception, the testimony must be corroborated by "evidence which shows that the inventor disclosed to others his completed thought expressed in such clear terms as to enable those skilled in the art to make the invention." *Coleman v. Dines,* 754 F.2d 353, 359 (Fed. Cir. 1985) (internal quotations omitted). It is Tessera's burden to prove that by June 10, 1990, the inventors of the '326 and '419 patents had conceived of the inventions disclosed therein. *Coleman*, 754 F.2d. at 359.

The record evidence shows that in the fall of 1989, Dr. DiStefano and Dr. Khandros came to Dr. Bottom's home to discuss how to start a company and how to approach the venture capital community. CFF 4584 (admitted). Dr. DiStefano and Dr. Bottoms had a long established relationship, although they had never started a business together. CFF 4583 (admitted). DiStefano and Khandros viewed Bottoms as a mentor and a sounding board and relied on his business experience and advice to guide them in starting and running their company, IST Associates ("IST"). CFF 4586 (admitted). Bottoms was very involved in the early days of IST and would meet regularly

with Khandros and DiStefano to discuss their ideas and strategize how to develop those with the most promise. CFF 4579 (admitted).

While at IST, Khandros and DiStefano memorialized their technical data in engineering notebooks. CFF 4589 (admitted). The purpose of the engineering notebooks was to record those ideas that were novel, not to record everything everyone talked about. *See* DiStefano, Tr. at 270:4-80; Bottoms, Tr. at 1183:13-21. Also, the evidence suggests individual notebook entries were not intended to be read in isolation. *Id.* Thus, contrary to Respondents' assertion, the fact that no single notebook entry in the May - June 1990 time frame illustrates or describes the entire invention embodied in the asserted independent claims of the '326 and '419 patents is not fatal to Tessera's argument regarding the date of conception.

To validate the date of the engineering notebook entries, DiStefano and Khadros had a discipline of having the notebook entries written by one person and witnessed by another person. DiStefano, Tr. at 175:20-176:1; Bottoms, Tr. at 1144:3-23. According to the record evidence, witnessing a notebook entry meant that the signatory had read and understood the content of that entry. *Id.* at 175:20-176:1. Consistent with his role as Vice President of Technology, Dr. Khandros acted as the scribe for the notebook entries. DiStefano, Tr. at 180:23-181:10. Exhibit CX-1330C is a copy of the notebook that documents the work of DiStefano and Khandros during the first few years at IST. *Id.* at 175:8-176:25; CX-1330C.

Inventor DiStefano testified that in early June 1990, he and inventor Khandros conceived of an idea to address chip packaging reliability issues caused by solder ball failure resulting from the thermal expansion mismatch between the semiconductor chip and the PCB board. *See* DiStefano, Tr. at 170:2-171:13. Specifically, DiStefano testified that to solve the expansion mismatch problem

he and Khandros came up with the idea to decouple the solder balls from the semiconductor chip in order to allow the solder balls to move relative to the chip. *Id.* at 171:14-25, 172:17-20, 181:11-15, 182:17-185:22, 220:25-221:9. DiStefano testified that he and Khandros first conceived of decoupling the solder balls from the chip by simply not attaching the interposer (a.k.a. "decal") that the chip is mounted on to the chip. *Id.* at 171:14-21. According to DiStefano, this would let the terminals on the interposer move and slide so that the solder balls could move with the interposer without any associated strain. *Id.* at 171:14-21, 182:17-184:1.

DiStefano's testimony is corroborated by Dr. Bottoms, who is not an inventor on either of the patents in suit. As previously stated, Dr. Bottoms was actively involved in the startup of IST, acting as both a mentor and sounding board for DiStefano and Khandros. Dr. Bottoms began regularly meeting with DiStefano and Khandros "[p]robably sometime in April but certainly through the period of May and June." Bottoms, Tr. at 1134:6-7. Dr. Bottoms testified that he was aware of the semiconductor chip packaging issues on which DiStefano and Khandros were working. *Id.* at 1134:11-14. According to the evidence, Bottoms would review the lab notebook every time he visited IST to catch up on what had occurred at IST since his last visit. *Id.* at 1144:4-23. Bottoms testified that in the May-June 1990 time frame, Di Stefano and Khandros were working on a solution to the thermal mismatch problem between the semiconductor chip and the substrate on which it was mounted. Specifically, Bottoms testified that DiStefano and Khandros were working on a "way to allow the chip to expand at the rate it expanded, . . . and allow the expansion rate of inexpensive polymer substrates to take place at the rate it occurred, . . . by having some layer that allowed movement of one of those elements with respect to the other elements, without damaging the reliability of the device." *Id.* at 1137:23-1138:10. Bottoms also testified that during the May-June

1990 time frame he had discussions with DiStefano and Khandros regarding a face-up embodiment that addressed the thermal mismatch problem that DiStefano and Khandros were working on. *Id.* at 1140:2-10. In fact, Bottoms testified that around June 1990 he was shown a model of what IST was intending to build and that model had the semiconductor chip in a face-up orientation. *Id.* at 1140:10-14. More particularly, Bottoms testified that the model included a chip in a face-up orientation and bonding wires running from contact pads on the top of the chip down alongside to contact pads on the bottom of the model. *Id.* at 1140:15-1141:9.

DiStefano's and Bottom's testimony is further corroborated by the entries in IST's engineering notebook. [

]

[

] in this entry corroborates the testimony of DiStefano and Bottoms that the inventors were considering face-up configurations in June of 1990.

[

] *See* CX-1330C at 19; CX-3205C (Ivey, Wit. Stat.) at ¶ 83. Thus, with regard to the limitation of claim 1 of the '326 patent requiring "bonding wires connected to said contacts on said front surface of said chip, said bonding wires extending downwardly alongside said edges of said chip and being connected to the lead portions on the backing element," the illustrated bonding wires support a June 1990 conception date *See supra*, at V.D.2.

Respondents argue that the drawings in the notebook fail to explicitly illustrate terminals as required by the asserted claims of the '326 and '419 patents. While Tessera's expert Dr. Ivey admits [ ] Dr. Ivey testified credibly that "a person of ordinary skill looking at the entries would recognize that you need some kind of terminal to connect the package. So I don't think there is a leap here to draw the conclusion that there would be terminals." *See* CX-3205C (Ivey, Wit. Stat.) at ¶¶ 84, 85. DiStefano also testified that the terminals would typically be part of the substrate. DiStefano, Tr. at 190:5-17. Specifically, [

] *Id.* at 270:9-15.

Based on the evidence detailed above, including the testimony of Dr. DiStefano and Dr. Bottoms, and the entries in the IST notebook, the ALJ finds that as of June 1990 inventors DiStefano and Khandros had conceived of the inventions embodied in the asserted claims of the '326 and '419 patents such that only ordinary skill would be necessary to reduce the invention to practice. *Stern v. Trustees of Columbia University in City of New York*, 434 F.3d 1375, 1378 (Fed. Cir. 2006) ("[c]onception is complete when the idea is so clearly defined in the inventor's mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or

experimentation." (internal quotations omitted)). Accordingly, the ALJ finds that the inventions claimed in the asserted claims of the '326 and '419 patents are entitled to a date of conception of no later than June 1990.

The evidence also shows that continuing from June 1990, inventors DiStefano and Khandros acted with due diligence in reducing their conceived invention to practice, culminating with the filing of the '265 patent application on March 21, 1991. In particular, the evidence shows that from June 1990, to the March 1991 filing date of the '265 patent, the inventors were either busy obtaining the equipment and materials necessary to build working prototypes that would implement their inventions or actually building the prototypes themselves. *See* DiStefano, Tr. at 192:6-10, 192:17-193:1, 193:19-194:6, 200:11-23, 202:5-211:15; Bottoms, Tr. at 1142:10-1144:2; JX-69C (invoices documenting material and equipment purchases by IST in the 1990-1991 time frame); CX-1048C (photographs of vintage chip packages made by IST during their early years). The ALJ finds based on the above cited evidence of record that the inventors of the asserted '326 and '419 patents acted with due diligence in reducing their intention to practice.

As stated above, Tessera asserts that the invention conceived by DiStefano and Khandros in June1990 was constructively reduced to practice with the filing of the '265 patent, from which the asserted '326 and '419 patents claim priority. *See* JX-1; JX-2. Respondents, however, argue that the '265 patent cannot constitute a reduction to practice because the '265 patent does not disclose the inventions claimed in the '326 and '419 patents. *See* RIB at 66. The evidence of record, however, is to the contrary. Specifically, the '265 patent discloses a semiconductor assembly comprising "a semiconductor chip having oppositely facing front and rear surfaces and edges extending between said front and rear surfaces," and contacts on the front surface of said chip. *See*

RX-584 at 20:30-26:9. The '265 patent also discloses bonding wires connected to the contacts on the front surface of the chip and extending downwardly alongside the edges of the chip to connect to the lead portions on the backing element. *Id.* at 6:34-59, 10:40-57, 12:52-13:6, 18:36-19:23, Figures 3, 4, 9, 10, 13, 14. Additionally, the '265 patent discloses "a backing element having a top surface overlying the rear surface of the chip, the backing element extending outwardly beyond at least some of the edges of the chip." *Id.* at 6:38-43, 20:30-26:9. In addition to the backing element, the '265 patent also discloses a flexible interposer that overlies the semiconductor chip. *Id.* According to the '265 patent, both the interposer and the backing element may include a compliant layer. *See id.* at 9:50-66, 6:38-43, 16:19-24, 19:19-21. The '265 patent further discloses electrically conductive terminals, at least some of which overlying the rear surface of the chip, and connected to the lead portions on the backing element. *Id.* at 5:57-63, 6:34-59, 10:40-47, 18:36-19:23, 20:30-26:9, Figures 2, 3, 9, 10, 13, 14.

In particular, Figure 13 of the '265 patent illustrates a semiconductor chip assembly having an interposer 636 overlying the front (top) surface of the chip and sheet-like backing element 660 overlying the rear (bottom) surface. *Id.* at 18:37-57. Figure 14 illustrates chip assemblies stacked on top of each other, with the backing element 660 of each chip assembly overlying the interposer 636 of the next lower assembly. *Id.* at 19:3-8. When this assembly is attached to a PCB, either the interposer or the backing element will be between the chip and the PCB. *Id.* at 9:18-23. The flexibility of the interposer/backing element, the flexibility of the leads, and the movability of the terminals with respect to the chip are all discussed in detail in the '265 patent and although not discussed with such specificity with regard to the embodiment illustrated in Figures 13 and 14 apply with equal force as one of ordinary skill in the art would recognize. *See id.* at 18:37-19:23; *see also*

CX-3205 (Ivey, Wit. Stat.) at 102. Thus, for the reasons discussed above, the ALJ finds the '265 patent constitutes the constructive reduction to practice of the invention conceived by DiStefano and Khandros in June 1990.

Having determined above that inventors DiStefano and Khandros conceived of the invention embodied in the asserted claims of the '326 and '419 patents in June 1990 and thereafter diligently reduced their invention to practice, the ALJ finds that the '326 and '419 patents are entitled to a June 1990 date of invention.[21]

B. Anticipation

1. Applicable Law

A patent may be found invalid as anticipated under 35 U.S.C. § 102(a) if "the invention was known or used by others in this country, or patented or described in a printed publication in this country, or patented or described in a printed publication in a foreign country, before the invention thereof by the applicant for patent." 35 U.S.C. § 102(a). A patent also may be found invalid as anticipated under 35 U.S.C. § 102(b) if "the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States." 35 U.S.C. § 102(b). Additionally, under 35 U.S.C. § 102(e), a patent is invalid as anticipated if "the invention was

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[21] In *Certain Semiconductor Chips with Minimized Chip Package Size and Products Containing Same,* Inv. No. 337-TA-432, Initial Determination, (September 26, 2001), Finding of Fact 912, the ALJ found that the evidence supported an invention date of June 10, 1990 for the claims of the '326 patent. Additionally, Finding of Fact 997 found that "[t]he '265 patent discloses face-up semiconductor assemblies to one of ordinary skill in the art at the time the '265 patent was filed (on March 21, 1991)." Further, Finding of Fact 991 found that "[t]he '265 patent discloses 'wherein such backing element is flexible to facilitate the movement of the terminals with respect to the chip.'" That investigation involved different respondents from the present investigation.

described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent." 35 U.S.C. § 102(e). Anticipation is a question of fact. *Texas Instruments, Inc. v. U.S. Int'l Trade Comm'n*, 988 F.2d 1165, 1177 (Fed. Cir. 1993).

A claim is anticipated and therefore invalid when "the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation." *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000). To be considered anticipatory, the prior art reference must describe the applicant's "claimed invention sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention." *Helifix Ltd. v. Blok-Lok, Ltd.*, 208 F.3d 1339, 1346 (Fed. Cir. 2000) (quoting *In re Paulsen,* 30 F.3d 1475, 1479 (Fed. Cir. 1994)). As stated above, a single prior art reference may anticipate without expressly disclosing a feature of the claimed invention, but only if that missing feature is necessarily present, or inherent, in the reference. *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003). "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Continental Can Company USA v. Monsanto Company,* 948 F.2d 1264, 1269 (Fed.Cir.1991). The theory of inherent anticipation serves to accommodate "situations where the common knowledge of technologists is not recorded in the reference; that is, where technological facts are known to those in the field of the invention, albeit not known to judges." *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1328, 1330 (Fed. Cir. 2005)(quoting *Continental Can,* 948 F.2d at1269).

2. The 1989 68HC11 OMPAC

Respondents argue that the 1989 68HC11 OMPAC chip package ("OMPAC") anticipates the asserted claims of the '326 and '419 patents under 35 U.S.C. §102(b) and under 35 U.S.C. §102(g).

a. 35 U.S.C. § 102(b)

Respondents assert that the OMPAC is prior art under 35 U.S.C. §102(b) because it was on sale more than one year before the priority date of the asserted patents. RIB at 60. Specifically, Respondents argue that in July 1989 Citizen Watch offered to make and sell OMPAC packages. Respondents argue that the OMPAC packages were then assembled and delivered to Motorola in the United States in September 1989. *Id.* at 61. Respondents assert that both the commercial offer for sale in July 1989 and the actual sale in September 1989 were at least one year before the March 21, 1991 priority date asserted by Tessera. *Id.* Respondents also assert that the fabrication of the OMPAC packages in September 1989 constitutes a reduction to practice. *Id.*

Tessera and the Staff contest Respondents' argument that the '326 and '419 patents are anticipated by the alleged offer for sale of an OMPAC package by Citizen Watch to Motorola in July 1989 or the alleged sale of an actual OMPAC package in September 1989. Tessera and the Staff contend that there was no commercial offer for sale between two separate entities and that, at that time, the OMPAC packages were not ready for patenting. Tessera and the Staff also argue that Respondents have not established that the OMPAC packages practice the asserted claims of the '326 and '429 patents.

35 U.S.C. §102(b) prohibits an invention from being patented if it was on sale in the United States more than one year prior to the filing date of the application. 35 U.S.C. § 102(b). To qualify

as prior art under §102 (b), the alleged on-sale product: (1) must have been the subject of a commercial offer for sale more than one year before the critical date of the asserted patents; and (2) must have been ready for patenting. *Pfaff v. Wells Elecs.*, 525 U.S. 55, 66-67 (1998). The ALJ has found herein that the asserted claims of the '326 and '419 patents are entitled to a June 1990 date of invention. *See,* supra, at VII.A. The alleged July 1989 offer by Citizen Watch to make and sell OMPAC packages for Motorola was not more than one year prior to the June 1990 date accorded the '326 and '419 patents. Accordingly, the alleged July 1989 offer for sale of OMPAC packages from Citizen Watch to Motorola does not qualify as prior art under 35 U.S.C. §102(b) and thus cannot invalidate the asserted claims of the '326 and 419 patents.

Even assuming *arguendo* that the '326 and '419 patents have a date of invention that is later than June1990, the evidence still does not clearly and convincingly show that the OMPAC packages were ever "on-sale" within the meaning of 102(b). Specifically, the evidence shows that Mr. Freyman, the manager of the IC Packaging Lab for the Communications Division of Motorola, contacted Citizen Watch in Japan about producing "engineering samples" or "prototypes" of a package with characteristics that were specified by Motorola. *See* RX-3129C (Freyman, Wit. Stat.) at ¶ 26; Freyman, Tr. at 679:5-14, 707:10-16, 708:14-19, 709:24-710:1, 711:5-8, 720:7-22. In addition, the evidence shows that Motorola dictated the dimensions and materials for the engineering samples, with Citizen Watch acting merely as a manufacturing subcontractor. *See* RX-1415 (May 9, 1989 letter from Motorola to Citizen Watch of Japan, specifying characteristics for the 1989 OMPAC 68-pin package); Freyman, Tr. at 708:3-13. Further, Freyman testified that Citizen Watch was subject to a confidentiality agreement with Motorola. Freyman, Tr. at 708:23-709:10. Pursuant to that agreement, Citizen Watch could not have sold the engineering samples to any other company,

or otherwise have disclosed any information regarding the 1989 OMPAC 68-pin package to any entity but Motorola. *Id.*

As detailed above, the subcontract agreement between Motorola and Citizen Watch was subject to a confidentiality agreement that prevented Citizen from disclosing or selling the OMPAC to any entity other than Motorola. *See Netscape Communs. Corp. v. Konrad*, 295 F.3d 1315, 1320-1321 (Fed. Cir. 2002) (Confidentiality obligations are a factor in determining whether the on sale bar should apply). Additionally, the evidence shows that the 200 prototypes were for Motorola's experimental use. *See* Freyman, Tr. at 682:3-20; *see also Atlanta Attachment Co. v. Leggett & Platt, Inc.*, 516 F.3d 1361, 1365 (Fed. Cir. 2008) ("While [a]ny attempt to use [an invention] for profit ... would deprive the inventor of his right to a patent, an inventor's use by way of experiment does not bar patentability. Therefore, we must consider whether the suspect activities were experiments as opposed to an attempt to profit from the invention, that is, whether the primary purpose of the offers and sales was to conduct experimentation") (internal quotations and citations omitted); *Manville Sales Corp. v. Paramount Sys., Inc.,* 917 F.2d 544, 550 (Fed.Cir.1990) ("a sale that is primarily for experimental purposes, as opposed to commercial exploitation, does not raise an on sale bar"); *U.S. Envt'l Prods., Inc. v. Westall,* 911 F.2d 713, 716 (Fed.Cir.1990) ("[a] section 102(b) bar is avoided if the primary purpose of the sale was experimental"). Accordingly, the ALJ finds Citizen Watch's production and sale of 200 OMPAC prototypes for Motorola's consumption in 1989 was not a "commercial sale" that would trigger the on-sale bar of 35 U.S.C. § 102 (b).

Moreover, the ALJ finds that Respondents have failed to prove clearly and convincingly that the OMPAC meets all the limitations of the asserted claims of the '326 and '419 patents. In particular, the evidence shows that the OMPAC utilizes a design that is fundamentally different than

that of the '326 and '419 patents to relieve mechanical stresses and improve chip package reliability. For example, while the parties agree that the claimed movement in the '326 and '419 patents is not the result of CTE matching, Respondents' expert Dr. Lall testified that the OMPAC was designed with "[t]he material of the substrate . . . chosen to have a CTE similar to that of the printed circuit board to attain thermo-mechanical reliability." RX-3124C (Lall, Wit. Stat.) at ¶ 247. Additionally, the evidence shows that the OMPAC used very large, compliant solder balls of approximately 30 mils in height to help absorb the remaining stress that was not otherwise handled by trying to match the CTEs of the package substrate and the PCB. *See* CX-3321C (Urbish, Wit. Stat.) at ¶¶ 79-81; CX-3205C (Ivey, Wit. Stat.) at ¶ 174. Furthermore, while the '326 and '419 patents teach decoupling the chip from the substrate, both Mr. Urbish[22] and Respondents' expert Dr. Lall testified that the OMPAC was designed to be as rigid as possible so as to effectively isolate the die to eliminate any stress being applied to the die. *See* CX-3321C (Urbish, Wit. Stat.) at ¶¶ 76-78; RX-3124C (Lall, Wit. Stat.) at ¶ 272; CX-3205C (Ivey, Wit. Stat.) at ¶ 173. According to Mr. Urbish, the inventors of the OMPAC package never even considered shifting the movement that occurred in the compliant solder joints into the package. CX-3321C (Urbish, Wit. Stat.) at ¶ 83.

Thus, it is not surprising that while Respondents' expert Dr. Sitaraman asserts that the OMPAC shows the required movement claimed in the '326 and '419 patents, the evidence does not

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[22] Between 1980 and 2002, Mr. Urbish was an Engineering Manager at Motorola. He was in charge of the Advanced Manufacturing Technology Group in the Land Mobile Product Sector, and he was a direct supervisor of Bruce Freyman during the development of the first OMPAC. *See* CX-3321C (Urbish, Wit. Stat.) at ¶¶ 2, 12, 46. The Advanced Manufacturing Technology Group was responsible for developing advanced technologies for manufacturing and assembling semiconductor packages, as well as interconnect solder assemblies and PCBs. *Id.* at ¶ 13. During Mr. Urbish's time at Motorola as an Engineering Manager, he supervised Bruce Freyman, a manager in his group who reported directly to him. *See id.* at ¶ 46. The original idea of the OMPAC package was developed by Glenn Urbish, Bruce Freyman, and Bill Mullen. *Id.* at ¶¶ 20-21, 27-28).

support such a finding. In an effort to show that the OPMAC has the claimed movement, *i.e.*, the displacement of the terminals relative to the chip by external loads that appreciably relieves mechanical stresses, Sitaraman conducted finite element modeling of the OMPAC. Sitaraman, Tr. at 976:6-11, 18-20. To build his OMPAC model, Sitaraman testified that he needed information regarding the material properties and geometric dimensions of the OMPAC, including such things as the die attach adhesive that was used in the OMPAC, the glass transition temperature, the elastic modulus, the CTE, and the geometric dimensions of the chip, encapsulant and substrate. *See* Sitaraman, Tr. at 978:18-979:13, 979:4-5 ("I needed [to know] every little thing in that package to be able to model [it].").[23] The evidence shows that Sitaraman obtained the needed information from a variety of sources, not all contemporaneous with the 1989 development of the OMPAC. Sitaraman, Tr. at 981:25-982:2, 985:4-1003:5. Respondents argue that there is nothing wrong with using non-contemporaneous documents to obtain material property data for the 1989 OMPAC as long as the product codes are the same. According to Respondents, as long as the product codes are the same, the material properties will be identical. *See* RX-3129C (Freyman, Wit. Stat.) at ¶¶ 105, 108. Conversely, Respondents assert that if there was a change in the material properties of a component then there would be a different product code. *Id.*

As mentioned above, one of the pieces of information Sitaraman testified he needed to properly model the OMPAC was the elastic modulus of the die attach. To obtain the elastic modulus of the die attach, the record evidence shows that Sitaraman relied on a document dated July 3, 2003 (14 years after the date of the development of the OMPAC). *See* Sitaraman, Tr. at 991:23-992:10,

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[23] The input files containing such information were provided to Sitaraman by Respondents' counsel. Sitaraman, Tr. 979:14-17; RX-3179C (Sitaraman, Wit. Stat.) at ¶ 251.

992:17-20; RX-3179C (Sitaraman, Wit. Sat.) at ¶¶ 224-25; RX-1583C. According to Sitaraman, the 2003 document shows the elastic modulus of the die attach to be 4.95 GPa, which is the number he used in his finite element model. *See* Sitaraman, Tr. at 997:9-19. In contrast to the 4.95 GPa number relied on by Sitaraman, the record evidence includes two other references, CX-3165C and RX-307C, that show the elastic modulus of the die attach used in the OMPAC to be 7.35 GPa and 7.37 GPa, respectively. There is no indication which number represents the correct elastic modulus of the die attach used in the1989 OMPAC. Notably, the difference between the number relied on by Sitaraman and the numbers given in Exhibits CX-3165C and RX-307C is substantial. The accuracy and reliability of any model is only as good as its inputs. Because Respondents have failed to prove that the material data Sitaraman relied on to build his finite element model of the OMPAC is representative of the actual materials used in the 1989 OMPAC, Sitaraman's model is questionable at best. Accordingly, the ALJ finds that Respondents have failed to prove by clear and convincing evidence that the OMPAC has the claimed movement .

Because Respondents have failed to prove that the OMPAC meets all the limitations of the asserted claims of the '326 and '419 patents, the ALJ finds that the OMPAC does not anticipate the asserted claims of the '326 and '419 patents under 35 U.S.C. § 102(b).

b. 35 U.S.C. § 102(g)

Respondents assert that the OMPAC is prior art under 35 U.S.C. §102(g) because it was invented by another before the conception of the asserted patents. RIB at 60. Specifically, Respondents argue that the OMPAC was reduced to practice by September 1989 when it was manufactured by Citizen Watch and shipped to Motorola in the United States. RIB at 61. Respondents also argue that the OMPAC design was not abandoned, suppressed, or concealed

because it was commercialized and disclosed in a published paper and in patent applications. *Id.*

"The plain language of § 102(g) clearly requires that the prior invention be made 'in this country.'" *Apotex USA, Inc. v. Merck & Co.*, 254 F.3d 1031, 1036 (Fed. Cir. 2001). However, the evidence shows that in September 1989, 200 experimental prototypes of the 1989, 68-pin OMPAC package were shipped from Citizen Japan to Citizen USA. *See* RX-1593C; Freyman, Tr. at 679:22-25, 682:3-8; RX-3129C (Freyman, Wit. Stat.) at ¶¶ 124-25. Additionally, the evidence shows that the transfer of those prototypes was made FOB Japan, and the payment terms recite payment in Japanese Yen. *See* RX-1593C; Freyman, Tr. at 681:14-23. Because the evidence of record shows that the OMPAC packages were not "made" in this country, but rather were made in Japan by Citizen Watch of Japan, the ALJ finds that the OMPAC is not prior art under 102(g) and thus cannot invalidate the asserted claims of the '316 and '419 patents.

Moreover, as discussed above, the ALJ finds that Respondents have failed to prove by clear and convincing evidence that the OMPAC embodies each and every element of the asserted claims of the '316 and '419 patents. Thus, even assuming *arguendo* that the OMPAC was made by another in this country before the date of conception of the asserted patents and not concealed, suppressed or abandoned, the ALJ finds the OMPAC does not anticipate the asserted claims of the '326 and '419 patents under 35 U.S.C. § 102(g).

3. The Mullen Patent

Respondents argue that U.S. Patent No. 5,241,133 to Mullen, III et al. ("Mullen patent") anticipates the asserted claims of the '326 and '419 patents. RIB at 61. The Mullen patent titled, "Leadless Pad Array Chip Carrier" issued on August 31, 1993, from Application No. 976,720, filed on November 16, 1992, which was a continuation of Application No. 631,848, filed on December

21, 1990. *See* RX-2487. Respondents argue that the Mullen patent is prior art under 35 U.S.C. §102(e), because it issued with an effective filing date that is before the date of invention accorded the asserted claims of the '326 and '419 patents. RIB at 61.

The effective filing date of the Mullen patent is December 21, 1990. RX-2487. The date of invention accorded the asserted claims of the '316 and '419 patents is June 1990. *See, supra*, at VII.A. Because the Mullen patent was not filed before the invention of the asserted claims of the '326 and '419 patents, the ALJ finds the Mullen patent is not prior art under 35 U.S.C. § 102(e) and thus cannot anticipate the asserted claims of the '326 and '419 patents.

4. Lin Patent

Respondents argue that U.S. Patent No. 5,216,278 to Lin et al. ("Lin patent") anticipates the asserted claims of the '326 and '419 patents. RIB at 61. The Lin patent titled, "Semiconductor Device Having a Pad Array Carrier Package," issued on June 1, 1993, from Application No. 841,765, filed on March 2, 1992, which was a continuation of Application No. 622,059, filed on December 4, 1990. *See* RX-2486. Respondents argue that the Lin patent is prior art under 35 U.S.C. §102(e), because it issued with an effective filing date that is before the date of invention accorded the asserted claims of the '326 and '419 patents.

The effective filing date of the Lin patent is December 4, 1990. RX-2486. The date of invention accorded the asserted claims of the '316 and '419 patents is June 1990. *See, supra*, at VII.A. Because the Lin patent was not filed before the invention of the asserted claims of the '326 and '419 patents, the ALJ finds the Lin patent is not prior art under 35 U.S.C. § 102(e) and thus cannot anticipate the asserted claims of the '326 and '419 patents.

5. Freyman Patent

Respondents argue that U.S. Patent No. 4,700,473 to Freyman et al. ("Freyman patent") anticipates the asserted claims of the '326 and '419 patents. RIB at 69. The Freyman patent titled, "Method of Making an Ultra High Density Pad Array Chip Carrier" issued on October 13, 1987, from Application No. 902,819, filed on September 2, 1986, which was a division of Application No. 816,164, filed on January 3, 1986. *See* RX-550. The Freyman patent is prior art to the '326 and '419 patents under 35 U.S.C. § 102(b) because it issued as a patent more than one year before the June 1990 date of invention accorded the asserted claims of the '326 and '419 patents. *See* 35 U.S.C. § 102(b). Tessera cited the Freyman patent to the U.S. Patent and Trademark Office during the prosecution of the '419 patent application. *See* JX-4 at 287.

Respondents admit that the Freyman patent does not explicitly disclose all the limitations of the asserted claims of the '326 and '419 patents. *See* RX-2950 (Schaper, Wit. Stat.) at ¶ 670-71. Specifically, Respondents admit that the Freyman patent does not explicitly disclose that the terminals are moveable with respect o the chip. *Id.* Nevertheless, Respondents argue that the Freyman patent still anticipates the asserted claims of the '326 and '419 patents because the claimed movement is inherent to the Freyman patent. *Id.*

To that end, Respondents assert that the Freyman patent discloses a metallized flexible dielectric polyimide film slip 304 and a low stress die attach adhesive 402 . *Id.* at 672. Respondents also assert that the Freyman patent inherently discloses a compliant layer or die attach adhesive between the semiconductor chip and the metal die pad. *Id.* According to Respondents expert Dr. Schaper, the two layers of die attach adhesive, along with the flexible dielectric polyimide film slip, would be of sufficient modulus and thickness to allow the terminals to move with respect to the chip.

Id. In reaching that conclusion, Schaper relies entirely on what he alleges are Tessera's infringement contentions. *Id.* Respondents provide no specific proof that the two layers of die attach adhesive, along with the flexible dielectric polyimide film slip, would be of sufficient modulus and thickness to allow the terminals to move with respect to the chip. Moreover, the evidence suggests that polyimide film can be used in many configurations of varying thickness, only some of which might provide the claimed movement. CX-3205C (Ivey, Wit. Stat.) at ¶ 223. Additionally, the Freyman patent teaches that the flexible dielectric polyimide film is positioned between the silicon chip and a ceramic substrate, which according to Dr. Ivey's credible testimony isolates it from the terminals and prevents it from facilitating any movement of the terminals. *Id.* Nevertheless, even assuming that the two layers of die attach adhesive, along with the flexible dielectric polyimide film slip, would be of sufficient modulus and thickness to allow for terminal movement, Respondents fail to provide any proof that the terminal displacement would appreciably relieve the mechanical stresses that would have occurred but for the displacement as required by the claim construction adopted herein. *See supra*, at V.D.4.

For the reasons discussed above, the ALJ finds that Respondents have failed to prove by clear and convincingly evidence that the Freyman patent discloses a chip package assembly that would necessarily have the claimed movement, *i.e.*, the displacement of the terminals relative to the chip by external loads that appreciably relieves mechanical stresses that would have occurred but for the displacement. Accordingly, the ALJ finds that the Freyman patent does not anticipate the asserted claims of the '326 and '419 patents.

6. Okinaga Patent

Respondents argue that Japanese Patent Publication S61-177759 to Okinaga ("Okinaga patent") anticipates the asserted claims of the '326 and '419 patents. RIB at 71. The Okinaga patent titled, "Semiconductor Device" was published on August 9, 1986. *See* RX-549. The Okinaga patent is prior art to the '326 and '419 patents under 35 U.S.C. § 102(b) because it was described in a printed publication more than one year before the June 1990 date of invention accorded the asserted claims of the '326 and '419 patents. *See* 35 U.S.C. § 102(b). Tessera cited the Okinaga patent to the U.S. Patent and Trademark Office during the prosecution of the '419 patent application. *See* JX-4 at 258.

Respondents admit that the Okinaga patent does not explicitly disclose all of the limitations of the asserted claims of the '326 and '419 patents. CX-2950C (Schaper, Wit. Stat.) at ¶¶ 718, 719. In particular, Respondents admit that the Okinaga patent does not explicitly disclose that the terminals are moveable with respect to the chip. *Id.* at ¶ 719. Nevertheless, Respondents argue that the Okinaga patent still anticipates the asserted claims of the '326 and '419 patents because the claimed movement is inherent to the Okinaga patent. *Id.*

Specifically, Respondents argue that the Okinaga patent discloses the use of a low stress die attach adhesive, adhesive material 2, which according to Respondents' expert Dr. Schaper is of sufficient modulus and thickness to allow the terminals to move with respect to the chip. *Id.* at ¶ 720. In reaching that conclusion, Schaper relies entirely on what he alleges are Tessera's infringement contentions. *Id.* Respondents provide no specific proof that the adhesive material 2 would be of sufficient modulus and thickness to allow the terminals to move with respect to the chip. Moreover, even if the adhesive material 2, which is described in the Okinaga patent as a silicone-

based gel, would theoretically allow the terminals to move with respect to the chip, Tessera's expert Dr. Ivey credibly testified that the rigid package substrate taught by the Okinaga patent would prevent any such movement. *See* CX-3205C (Ivey, Wit. Stat.) at ¶ 243-44; *see also, id.* at ¶ 241-42 (As a general rule, Pin Grid Array packages ("PGAs"), such as those taught by Okinaga, are rigidly built in order to maintain the pitch and geometry of the pins that are used to connect the chip to the PCB.). However, even if the rigid package substrate would allow the terminals to move with respect to the chip, Respondents fail to provide any proof that such movement would appreciably relieve the mechanical stresses that would have occurred but for the movement as required by the claim construction adopted herein. *See supra*, at V.D.4.

For the reasons discussed above, the ALJ finds that Respondents have failed to prove by clear and convincingly evidence that the Okinaga patent discloses a chip package assembly that would necessarily have the claimed movement, *i.e.*, the displacement of the terminals relative to the chip by external loads that appreciably relieves mechanical stresses that would have occurred but for the displacement. Accordingly, the ALJ finds that the Okinaga patent does not anticipate the asserted claims of the '326 and '419 patents.

7. White Patent

Respondents argue that U.S. Patent No. 4,601,526 to White et al. ("White patent") anticipates the asserted claims of the '326 and '419 patents. RIB at 72. The White patent titled, "Integrated Circuit Chip Carrier" issued on July 22,1986, from Application No. 771,141, filed on August 28, 1985, which is a continuation of Application No. 546,2568, filed on October 28, 1983. *See* RX-2472. The White patent is prior art to the '326 and '419 patents under 35 U.S.C. § 102(b) because it issued as a patent more than one year before the June 1990 date of invention accorded the asserted

claims of the '326 and '419 patents. *See* 35 U.S.C. § 102(b).

Respondents admit that the White patent does not explicitly disclose all of the limitations of the asserted claims of the '326 and '419 patents. CX-2950C (Schaper, Wit. Stat.) at ¶¶ 808, 809. In particular, Respondents admit that the White patent does not explicitly disclose that the terminals are moveable with respect to the chip. *Id.* at ¶ 809. Nevertheless, Respondents argue that the White patent still anticipates the asserted claims of the '326 and '419 patents because the claimed movement is inherent to the White patent. *Id.*

Specifically, Respondents argue that the White patent discloses the use of a low stress die attach adhesive, adhesive 11, which according to Respondents' expert Dr. Schaper is of sufficient modulus and thickness to allow the terminals to move with respect to the chip. *Id.* at ¶ 810. In reaching that conclusion, Schaper relies entirely on what he alleges are Tessera's infringement contentions. *Id.* Respondents provide no specific proof that the adhesive 11 would be of sufficient modulus and thickness to allow the terminals to move with respect to the chip.

Moreover, Tessera's expert Dr. Ivey credibly testified that the attachment methods disclosed in the White patent are contrary to Dr Schaper's opinion that the adhesive 11 would be of sufficient modulus and thickness to provide the claimed movement. CX-3205C (Ivey, Wit. Stat.) at ¶ 267. Specifically, Dr. Ivey notes that the White patent teaches that the chip should be attached to the chip carrier with "a suitable adhesive," such as solder or epoxy. *Id.* Dr. Ivey points out that solder has a modulus typically in the range of 20 to 30 GPa, thus creating a very rigid structure with very little scope for movement. *Id.* Dr. Ivey also points out that epoxy may have a similar result, depending on the type of epoxy that is used. *Id.* Thus, based on Dr. Ivey's testimony, Dr. Schaper cannot *necessarily* conclude that the die-attach adhesive would be of sufficient modulus and thickness to

provide movement. *See id.*; *see also id.* at 269 ("[T]he White '526 patent's suggestion that solder and epoxy could be interchangeably used, without direction as to which should be used, indicates that the White '526 patent had neither understanding of how to pick a die attach that would facilitate the claimed movement nor a teaching as to how to facilitate the claimed movement."). However, even if the adhesive 11 would allow the terminals to move with respect to the chip, Respondents fail to provide any proof that such movement would appreciably relieve the mechanical stresses that would have occurred but for the movement as required by the claim construction adopted herein. *See supra*, at V.D.4.

For the reasons discussed above, the ALJ finds that Respondents have failed to prove by clear and convincingly evidence that the White patent discloses a chip package assembly that would necessarily have the claimed movement, *i.e.*, the displacement of the terminals relative to the chip by external loads that appreciably relieves mechanical stresses that would have occurred but for the displacement. Accordingly, the ALJ finds that the White patent does not anticipate the asserted claims of the '326 and '419 patents.

8. Saito Patent

Respondents argue that Japanese Patent Publication 63-051196 to Saito ("Saito patent") anticipates the asserted claims of the '326 patent.[24] RIB at 73. The Saito patent titled, "IC Card" was published on March 4, 1988. *See* RX-2412. The Saito patent is prior art to the '326 patent under 35 U.S.C. § 102(b) because it was published more than one year before the June 1990 date of invention accorded the asserted claims of the '326 patent. 35 U.S.C. § 102(b).

Respondents admit that the Saito patent does not explicitly disclose all of the limitations of

[24] Respondents do not argue that Saito anticipates the asserted claims of the '419 patent.

the asserted claims of the '326 patent. CX-2950C (Schaper, Wit. Stat.) at ¶¶ 855, 856. In particular, Respondents admit that the Saito patent does not explicitly disclose that the terminals are moveable with respect to the chip. *Id.* at ¶ 856. Nevertheless, Respondents argue that the Saito patent still anticipates the asserted claims of the '326 and '419 patents because the claimed movement is inherent to the Saito patent. *Id.*

Specifically, Respondents' expert Dr. Schaper argues that the Saito patent discloses a flexible layer in the form of a sheet-like polyimide resin substrate 22 and a die attach adhesive in the form of a silver paste that will allow the terminals to move with respect to the chip. *Id.* at 857. Dr. Schaper reaches his conclusion based entirely on what he alleges are Tessera's infringement contentions in this investigation. *Id.* Dr. Schaper provides no specific proof that the substrate 22 would be sufficiently flexible or that the silver paste is of sufficient modulus and thickness to allow for the claimed terminal movement.

Moreover, as Tessera's expert Dr. Ivey credibly testified, the integrated circuit card ("IC card") disclosed in the Saito patent has a very different structure than the conventional-style chip packages disclosed in the asserted patents. *See* CX-3205C (Ivey, Wit. Stat.) at ¶ 279. As such, Saito seeks to solve a different problem than that taught by the '326 patent. In particular, while the '326 patent is concerned with minimizing the CTE mismatch between the chip and the substrate, the Saito patent is concerned with the bending or twisting stresses placed on the chip. *Id.* Additionally, Dr. Ivey correctly points out that the only information disclosed in the Saito patent regarding the die adhesive is that it is made from silver paste. However, there is nothing intrinsic about silver paste that necessarily means that it would be of sufficient modulus and thickness to allow for the claimed terminal movement. Furthermore, even if Dr. Schaper was able to successfully show that the

substrate 22 and silver paste would allow the terminals to move with respect to the chip, Respondents fail to provide any proof that such movement would appreciably relieve the mechanical stresses that would have occurred but for the movement as required by the claim construction adopted herein. *See supra*, at V.D.4.

For the reasons discussed above, the ALJ finds that Respondents have failed to prove by clear and convincingly evidence that the Saito patent discloses a chip package assembly that would necessarily have the claimed movement, *i.e.*, the displacement of the terminals relative to the chip by external loads that appreciably relieves mechanical stresses that would have occurred but for the displacement. Accordingly, the ALJ finds that the Saito patent does not anticipate the asserted claims of the '326 patent.

C. Obviousness

1. Applicable Law

Under 35 U.S.C. § 103(a), a patent is valid unless "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103(a). The ultimate question of obviousness is a question of law, but "it is well understood that there are factual issues underlying the ultimate obviousness decision." *Richardson-Vicks Inc. v. Upjohn Co.*, 122 F.3d 1476, 1479 (Fed. Cir. 1997); *Wang Lab., Inc. v. Toshiba Corp.*, 993 F.2d 858, 863 (Fed. Cir. 1993).

Once claims have been properly construed, "[t]he second step in an obviousness inquiry is to determine whether the claimed invention would have been obvious as a legal matter, based on underlying factual inquiries including: (1) the scope and content of the prior art, (2) the level of

ordinary skill in the art, (3) the differences between the claimed invention and the prior art; and (4) secondary considerations of non-obviousness" (also known as "objective evidence"). *Smiths Indus. Med. Sys., Inc. v. Vital Signs, Inc.*, 183 F.3d 1347, 1354 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966)). Although the Federal Circuit has historically required that, in order to prove obviousness, the patent challenger must demonstrate, by clear and convincing evidence, that there is a "teaching, suggestion, or motivation to combine, the Supreme Court has rejected this "rigid approach" in *KSR Int'l Co. v. Teleflex Inc.*:

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. Sakraida and Anderson's-Black Rock are illustrative–a court must ask whether the improvement is more than the predictable use of prior art elements according to their established function.
>
> Following these principles may be more difficult in other cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement. Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicitly. *See In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusions of obviousness"). As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.
>
> [. . .]
>
> The obviousness analysis cannot be confined by a formalistic conception of the

> words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. Granting patent protection to an advance that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.

KSR Int'l Co. v. Teleflex Inc., 500 U.S. – (2007), 127 S.Ct. 1727, 1739.

"Secondary considerations," also referred to as "objective indicia of non-obviousness," such as "commercial success, long felt but unsolved needs, failure of others, etc." may be used to understand the origin of the subject matter at issue, and may be relevant as indicia of obviousness or non-obviousness. *Graham*, 383 U.S. at 17-18. Secondary considerations may also include copying by others, prior art teaching away, and professional acclaim. *See Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 857 (1984); *Avia Group Int'l, Inc. v. L.A. Gear California*, 853 F.2d 1557, 1564 (Fed. Cir. 1988) (copying by others); *In re Hedges*, 783 F.2d 1038, 1041 (Fed. Cir. 1986) (prior art teaching away; invention contrary to accepted wisdom); *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565 (Fed. ir. 1986), *cert. denied*, 479 U.S. 1034 (1987) (wide acceptance and recognition of the invention).

Evidence of "objective indicia of non-obviousness," also known as "secondary considerations," must be considered in evaluating the obviousness of a claimed invention, but the existence of such evidence does not control the obviousness determination. A court must consider all of the evidence under the *Graham* factors before reaching a decision on obviousness. *Richardson-Vicks Inc.*, 122 F.3d at 1483-84. In order to accord objective evidence substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed

invention, which is generally made out "when the patentee shows both that there is commercial success, and that the thing (product or method) that is commercially successful is the invention disclosed and claimed in the patent." *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995); *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988), *cert. denied*, 488 U.S. 956 (1988); *Certain Crystalline Cefadroxil Monohydrate*, Inv. No. 337-TA-293, Commission Opinion (March 15, 1990),15 U.S.P.Q.2d 1263, 1270. However, secondary considerations, such as commercial success, will not always dislodge a determination of obviousness based on analysis of the prior art. *See KSR Int'l*, 127 S.Ct. at 1745 (commercial success did not alter conclusion of obviousness).

2. Analysis

Respondents contend that if the asserted claims of the '326 and '419 patents are not fully anticipated by the prior art references they have identified as allegedly anticipating under 35 U.S.C. § 102, then the asserted claims are obvious under 35 U.S.C. § 103 in light of those references in combination with a separate group of references that Respondents refer to as the "Compliant Die Attach References." *See* RX-2950C (Schaper, Wit. Stat.) at ¶¶ 539, 541 (combination with the 1989 OMPAC 68-pin chip package), 583 (combination with Mullen), 629 (combination with Lin), 673 (combination with Freyman), 813 (combination with White), 858 (combination with Saito). The Compliant Die Attach References include: (1) the Vaccaro reference (RX-2510) dated October 1990; (2) the Suhir reference (RX-2503) dated 1987; (3) the Lutz reference (RX-2511) dated May 22, 1989; (4) the Shoraka reference (RX-2509) dated 1988; (5) the Otsuka reference (RX-2502) dated 1986); (6) the Heinen reference (RX-2512) dated 1987; and (7) the Suzuki reference (RX-577) dated

1990).[25] Respondents assert that the Compliant Die Attach References disclose various compliant die attach materials.

Specifically, Respondents argue that to the extent their allegedly anticipatory prior art references do not disclose movable terminals or a compliant layer, one of ordinary skill in the art would combine them with the Compliant Die Attach References, thereby rendering the asserted claims of the '326 and '419 patents obvious. Respondents argue that because it was known to use a low-stress die attach to "decouple a chip from a package substrate," it would therefore be obvious to use a compliant attach layer to appreciably relieve mechanical stresses between the chip and the PCB substrate due to an outside force. *See* RIB at 75-76. However, all of the Compliant Die Attach References that Respondents and Dr. Schaper rely on are directed to solving the problem of die-cracking and chip delamination caused by internal stresses between the chip and chip package. CX-3205C (Ivey, Wit. Stat.) at ¶ 297. Respondents fail to point to any prior art reference that suggests using a compliant layer inside the chip package that would allow the terminals to move with respect to the chip in response to an outside force to appreciably relieve mechanical stresses between the chip and PCB substrate. In fact, such a solution in 1990 would have been contrary to industry practice at the time. DiStefano, Tr. at 172:1-16. According to the evidence of record, in the 1990 time frame, the approach taken to protect the chip from stress and strain and to improve chip package reliability was to form a rigid connection between the chip and the substrate. *See* CX-3205C (Ivey,

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[25] The Vacarro reference was published in October 1990 and thus is not prior art to the asserted '326 and '419 patents. *See, supra*, at VII.A. (finding the '326 and '419 patents have a June 1990 date of invention). Similarly, the Suzuki reference may not be prior art as the record evidence only establishes that the Suzuki reference was published sometime in 1990. See RX-577; RX-2950C (Schaper, Wit. Stat.) at ¶ 521. Because the burden to prove invalidity falls on Respondents, Respondents failure to prove that the Suzuki reference is prior art it fatal to their claims of obviousness that rely on the Suzuki reference.

Wit. Stat.) at ¶¶ 113, 117. Respondents obviousness argument amounts to little more than an argument that because the various claimed elements were known to one of ordinary skill in the art as of June 1990, the asserted claims of the '326 and '419 patents must be obvious. The Supreme Court, however, recently reaffirmed the impropriety of such an approach, stating that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR*, 127 S.Ct. at 1741. Moreover, Respondents set forth no evidence that would suggest that any of the prior art disclosures teach use of a compliant layer that would be able to appreciably relieve mechanical stresses as required by the claim construction adopted herein.

Further, Tessera has submitted substantial secondary evidence of non-obviousness. *Graham v. John Deere Co*, 383 U.S. 1, 17-18 (1966). In particular, Tessera's licensing program of which the '326 and '429 patents are an integral part, has enjoyed widespread success in the market. CX-3201C (McWilliams, Wit. Stat.) at ¶¶ 61-64. Tessera estimates that over 10 billion semiconductors per year are made on which it receives royalty payments. *Id.* at ¶ 64. Tessera has licensed 62 companies to its TCC patent portfolio, which includes the '326 and '419 patents. *Id.* at ¶ 61; CX-3199C (Griffin, Wit. Stat.) at ¶ 20; CX-2607C (Pickett, Wit. Stat.) at ¶ 23. The evidence suggests that the '326 and '419 patents are of particular import to Tessera's TCC portfolio and licensing efforts because they are "base patents" that lay the foundation upon which other improvements are built. CX-2607C (Pickett, Wit. Stat.) at ¶¶ 22-23; CX-3199C (Griffin, Wit. Stat.) at ¶ 21. In fact, the evidence shows that [ ]. CX-2607C (Pickett, Wit. Stat.) at ¶ 25; Pickett, Tr. 342:24-343:14; CX-3199C (Griffin, Wit. Stat.) at ¶ 25. Notably, Tessera has received over [ ] in licensing revenues and royalty

payments since 2001. CX-2608C (Mitchell, Wit. Stat.) at ¶¶ 59-61. Further, Tessera has received recognition and a number of awards for its chip scale packaging technology, a category in which the inventions of the '326 and '419 patents fall. See CX-3201C (McWilliams, Wit. Stat.) at ¶¶ 47-59.

Accordingly, for the reasons discussed above, the ALJ finds that Respondents have failed to prove by clear and convincing evidence that the asserted claims of the '326 and '419 patents are invalid as obvious under 35 U.S.C. §103.

D. Indefiniteness - 35 U.S.C. § 112 ¶ 2

Respondents contend that the limitation "moveable," which is found in each of the asserted claims of the '326 and '419 patents, is indefinite under 35 U.S.C. § 112, ¶ 2. RIB at 43. Specifically, Respondents argue that the asserted patents fail to distinguish between the claimed movement and other movement that is present in chip packages, but not claimed. *Id.* at 44. Additionally, Respondents argue that the specification fails to identify any objective way to determine what amount of claimed movement constitutes infringement. *Id.* Tessera argues that its proposed construction of the limitation "moveable" is definite. CRB at 32-34. The Staff also argues that the limitation is not indefinite. SRB at 32.

Claims must ". . . particularly point[ ] out and distinctly claim[ ] the subject matter which the applicant regards as his invention." 35 U.S.C. § 112, ¶ 2; *Miles Laboratories, Inc. v. Shandon Inc.*, 997 F.2d 870, 874-75 (Fed. Cir. 1994). The purpose of this definiteness requirement is to ensure that the claims delineate the scope of the invention using language that adequately notifies the public of the patentee's right to exclude. *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1346 (Fed. Cir. 2007). If a claim read in light of the specification reasonably apprises one of ordinary skill in the art of its meaning, that claim satisfies § 112, ¶2. *Id.* In contrast, if a claim limitation is "insolubly

ambiguous" or "not amenable to construction," then the claim containing that limitation is invalid for indefiniteness. *See, e.g., Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347-1356 (Fed. Cir. 2005) (affirming summary judgment of invalidity due to indefiniteness); *Honeywell Int'l, Inc. v. United States Int'l Trade Comm.*, 341 F.3d 1332, 1338-1339 (Fed. Cir. 2003).

The limitations "terminals are moveable with respect to said chip," "terminals being moveable with respect to the chip to compensate for differential thermal expansion of the chip and substrate," and "movement of said terminals to compensate for differential thermal expansion of the chip and substrate" have been construed herein to mean that "in the operation of the assembly, the terminals are capable of being displaced relative to the chip by external loads applied to the terminals, to the extent that the displacement appreciably relieves mechanical stresses, such as those caused by differential thermal expansion which would be present in the electrical connections absent such displacement." *See supra*, at V.D.4. The above claim construction makes plain that the claimed movement is movement caused by an outside force (*i.e.*, external load) that appreciably relieves mechanical stresses that would be present absent such movement. So, for example, terminal movement not due to an outside force or terminal movement that does not appreciably relieve mechanical stresses that would be present absent such movement, is not the "claimed movement." Thus, the ALJ finds Respondents' argument that the asserted patents do not distinguish between the claimed and unclaimed movement unpersuasive.

With regard to Respondents' argument that the specification fails to identify any objective way to determine what amount of claimed movement constitutes infringement, the ALJ again is unpersuaded. The claim construction adopted herein and recited above requires terminal movement due to external loads that *appreciably relieves* mechanical stresses, such as those caused by

differential thermal expansion which would be present in the electrical connections absent such displacement. "A patentee need not define his invention with mathematical precision in order to comply with the definiteness requirement." *Oakley, Inc. v. Sunglass Hut Int'l*, 316 F.3d 1331, 1341 (Fed. Cir. 2003). Terms such as significant and substantial are "ubiquitous in patent claims" and routinely are upheld by the courts. *See Andrew Corp. v. GahrietElectronics, Inc.*, 847 F.2d 819, 821 (Fed. Cir. 1988) (the term "closely approximate" is definite); *see also Charvat v. Commissioner of Patents*, 503 F.3d 138, 148 (Fed. Cir. 1978) (courts frequently validate terms such as "substantial") (citing *Ethel Process Co. v. Minnesota. & Ontario Paper Co.*,261 U.S. 45, 65-66 (1923). Therefore, there is nothing inherently wrong with the requirement that the terminal movement *appreciably relieves* mechanical stresses.

The question is whether one of ordinary skill in the art can discern what is meant by "appreciably relieves mechanical stresses . . ." On this point, the evidence shows that one skilled in the art would readily be able to understand the scope of the asserted claims of the '326 and '419 patents when read in light of the specifications. In fact, the evidence shows that two of Respondents' own experts were able to discern the metes and boundaries of the asserted claims. In particular, Dr. Sitaraman was able to discern a dividing line between what is an appreciable relief of stress and what is not. *See* RX-3179 (Sitaraman, Wit. Stat.) at ¶¶ 85, 389; Sitaraman, Tr. at 967:10-14, 971:6-11. Additionally, Dr. Madenci testified in this Investigation that he was able to determine what would literally be within the scope of the asserted claims. *See* Madenci, Tr. at 1475:25-1476:25.

Accordingly, for the reasons discussed above, the ALJ finds that Respondents have failed to prove by clear and convincing evidence that the limitations "terminals are moveable with respect to said chip," "terminals being moveable with respect to the chip to compensate for differential thermal

expansion of the chip and substrate," and "movement of said terminals to compensate for differential thermal expansion of the chip and substrate" are indefinite under 35 U.S.C. § 112 ¶ 2.

E. Enablement - 35 U.S.C. § 112 ¶ 1

35 U.S.C. § 112, ¶1 requires that the inventor provide sufficient information about the claimed invention so that a person of ordinary skill in the art at the time of the invention could make and use the invention without undue experimentation. *PPG Indus., Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1563-65 (Fed. Cir. 1996). A specification must enable a person skilled in the art to practice the invention as broadly as it is claimed. *In re Goodman*, 11 F.3d 1046, 1050 (Fed. Cir. 1993). The enablement requirement does not forbid all experimentation in order for a person to practice the claimed invention, but it does forbid "undue experimentation." *National Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1197 (Fed. Cir. 1999). Whether certain experimentation is undue is a legal question that depends on the underlying facts of each case. *Id.*

An enabling specification must provide the novel aspects of the invention, but does not have to describe information that was well known to one skilled in the art. *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366 (Fed. Cir. 1997). The enablement requirement is met if the description enables any mode of making or using the invention. *Engel Indus., Inc. v. Lockformer Co.*, 946 F.2d 1528, 1533 (Fed. Cir. 1991). Enablement is determined from the viewpoint of persons of ordinary skill in the field of the invention at the time the patent application was filed. *Ajinomoto Co., Inc. v. Archer-Daniels-Midland Co.*, 228 F.3d 1338, 1345 (Fed. Cir. 2000).

Respondents argue that the asserted claims of the '326 and '419 patents are not enabled because they do not teach one of ordinary skill how to implement the invention with a rigid backing

element (*i.e.*, one made from BT-resin). RIB at 50-52; RX-3124C (Lall, Wit. Stat.) at ¶ 158. Respondents argue that the asserted patents only disclose the use of a flexible backing element to allow for the claimed terminal movement. *See* RIB at 51. In support, Respondents argue that the embodiment of the invention illustrated in Figure 26 of the asserted patents could not be achieved using a non-flexible backing element. *Id.* at 52.

Contrary to Respondents' argument, there is nothing in the asserted patents that requires the backing element in the independent claims of the '326 and '419 patents to be flexible. In fact, because dependent claim 3 of the '326 patent and dependent claim 16 of the '419 patent explicitly require the backing element to be flexible, under the doctrine of claim differentiation the scope of the independent claims on which claim 3 of the '326 patent and claim16 of the '419 patent rely should be broad enough to cover both flexible and non-flexible backing elements. *See* JX-1; JX-2; *see also* CX-3205C (Ivey, Reb. Wit. Stat.) at ¶ 397. To hold otherwise would render dependent claims 3 and 16 superfluous. Moreover, the intrinsic evidence relied on by Respondents to support their conclusion that the patent specification only discloses flexible backing elements focuses on just one embodiment. Reading the claims and embodiments together a person of ordinary skill in the art would understand that the backing element could be made rigid, so long as it was not made so rigid that it would not permit the claimed movement to occur (as would be the case with a ceramic package substrate, which has a modulus of around 300 Gpa). *See* CX-3205C (Ivey, Wit. Stat.) at ¶ 401.

The evidence further demonstrates that one of ordinary skill would also understand that FEA modeling and Moiré testing, as described by both Tessera's expert Dr. Qu and Respondents' expert Dr. Sitaraman, could be used to determine if a chip package contained materials that would exhibit

the claimed movement. Indeed, there appears to be no dispute that these techniques are well known, standard tools used in the industry to determine the amount of displacement in an electronic package. *See* CX-1884C; CX-1885C; CX-1886C; CX-1887.

Accordingly, for the reasons discussed above, the ALJ finds Respondents have failed to prove by clear and convincing evidence that the asserted claims of the '326 and '419 patents are not enabled under 35 U.S.C. § 112 ¶ 1.

F. Written Description - 35 U.S.C. § 112 ¶ 1

Respondents have not asserted in their initial post-hearing brief that the asserted claims of the'326 and '419 patents are invalid for failing to satisfy the written description requirement under the first paragraph of Section 112. 35 U.S.C. § 112, ¶ 1. Therefore, the ALJ finds that Respondents have waived any such argument pursuant to Ground Rule 11.1. Order No. 11 (October 30, 2007).

VIII. ST-NV'S "LICENSING" DEFENSE[26]

ST-NV argues that all accused products sold or imported by ST-NV fall under the scope of a world-wide license agreement between Tessera and ST-NV's U.S. subsidiary, ST-Inc. Based on that license agreement and representations Tessera allegedly made in a co-pending case in the United States District Court for the Northern District of California,[27] ST-NV argues Tessera is estopped from asserting in this investigation claims against products that even "arguably" fall under the license agreement. *See* RIB re: License Agreement at 4-8. ST-NV also argues, as a purchaser of

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[26] Order No. 58 set the post-hearing briefing schedule in this investigation. *See* Order No. 58 (July 23, 2008). In addition to the parties' normal post-hearing briefing, the ALJ permitted Respondent ST-NV, Complainant Tessera, and the Staff to specially address ST-NV's affirmative license defense in separate post-hearing briefs. *Id.*

[27] *Tessera, Inc. v. Advanced Micro Devices, Inc.*, Civil Action No. C05-04063 (N.D. CA.).

"authorized" ST-Inc. products, that the doctrines of patent exhaustion and implied license further bar Tessera from asserting its infringement claims against ST-NV. *Id.*

Tessera admits in its reply brief that it is judicially estopped from asserting that any accused products sold or imported by ST-Inc., or its customers, infringe the asserted patents in this investigation. CRB re: License Agreement at 1. Tessera also admits that any accused products sold by ST-Inc. would be subject to the doctrine of patent exhaustion. *Id.* However, Tessera argues that there are admittedly accused products that ST-NV sells to third parties for incorporation into finished goods that are imported into the United States that are outside of the Tessera-ST-Inc. license agreement. *Id.* Tessera argues that it is those products for which it seeks an exclusion order in this investigation. *Id.*

The Staff argues that in light of the license agreement between Tessera and ST-Inc. and statements made by Tessera in the co-pending California District Court case that Tessera is estopped from asserting that any accused products imported into the United States by ST-Inc. infringe the patents at issue in this investigation. SIB re: License Agreement at 1-2. The Staff also appears to agree that any sales of accused products by ST-Inc. would be subject to the patent exhaustion doctrine. *Id.*

At the outset it is worth pointing out that contrary to ST-NV's position in its initial brief that all of its products Tessera accuses of infringement that have been imported into the United States or sold for importation fall under the scope of the Tessera-ST-Inc. license agreement, ST-NV now admits that 14 accused products, which were not sold through ST-Inc., have been imported into the United States in downstream products. RRB re: License Defense at 5. Accordingly, there can be no question that these 14 accused products are subject to the Commission's jurisdiction and are not

subject to ST-NV's license defense.

With regard to the other of ST-NV's products that Tessera accuses of infringing the '326 and '419 patents, the ALJ has found herein that Tessera has proven by a preponderance of the evidence that those products are incorporated into finished downstream products that are imported, sold for importation, or sold after importation into the United States. *See, supra,* at II.A. ST-NV's argument that Tessera bears the burden of showing the accused products imported into the United States are "unlicensed" is unsupported and unpersuasive. Tessera's only burden is to show that the accused products have been imported, sold for importation, or sold after importation into the United States. *See* 19 U.S.C. § 1337(a)(1)(B). Having made such a showing, the burden is on ST-NV as the proponent of its license defense to show those imported downstream products that incorporate ST-NV's accused products are subject to the Tessera-ST-Inc. license agreement. However, the only evidence that ST-NV has proffered on this point regards 47 accused products sold to Nokia during the 2007 calendar year. Malone, Tr. at 1494:14-1498:19. Tessera admits in its reply brief that with regard to those 47 accused products, ST-NV has established its affirmative defense. CRB re: License Defense at 6. ST-NV sets forth no other specific evidence that would show that any of its accused products being imported into the United States in downstream products is even arguably subject to the Tessera-ST-Inc. license. Accordingly, with the exception of the 47 products that Tessera admits fall within the Tessera-ST-Inc. license agreement, the ALJ finds that ST-NV has failed to prove its license defense.

IX. DOMESTIC INDUSTRY

A. Applicable Law

Section 337 declares unlawful the importation, the sale for importation or the sale in the United States after importation of articles that infringe a valid and enforceable U.S. patent only if "an industry in the United States, relating to articles protected by the patent . . . concerned, exists or is in the process of being established." 19 U.S.C. § 1337(a)(2). Thus, as stated in the notice of investigation, a determination must be made as to whether an industry in the United States exists or is in the process of being established as required by subsection (a)(2) of section 337.

A domestic industry is defined in subsection 337(a)(3) as follows:

> (3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark or mask work concerned --
>
> (A) significant investment in plant and equipment;
>
> (B) significant employment of labor or capital; or
>
> (C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3).

The domestic industry requirement is satisfied by meeting the criteria of any one of the three factors listed above. *Certain Semiconductor Chips with Minimized Chip Package Size and Products Containing Same*, Inv. No. 337-TA-432, Order No. 13 (Initial Determination) at 5 (Jan. 24, 2001), Commission Notice Not to Review Commission (Feb. 26, 2001). The existence of a domestic industry is determined with reference to the time that the complaint was filed. *Bally/Midway Mfg.*

Co. v. United States Int'l Trade Comm'n , 714 F.2d 1117, 1122 (Fed. Cir. 1983).

If it is alleged that a domestic industry exists pursuant to factor (A) or (B) enumerated above, the domestic industry analysis will necessarily consist of both an economic prong (e.g., there must be investments in the United States) and a technical prong (e.g., an industry must relate to articles that practice the patented invention). *See Certain Ammonium Octamolybdate Isomers,* Inv. No. 337-TA-477, Commission Opinion at 55, USITC Pub. 3668 (Jan. 2004).

Based upon the legislative history accompanying its enactment, the Commission has held that subsection (C) requires a "simpler test" for domestic industry than the criteria required under subsections (A) and (B). *Certain Microlithographic Machines and Components Thereof,* Inv. No. 337-TA-468, Initial Determination on Violation at 346, *adopted in relevant part in* Notice of Commission Determination Not to Review a Final Initial Determination Finding No Violation of Section 337 [and] Termination of the Investigation (March 17, 2003). When a complainant relies on the existence of a licensing program to satisfy subsection (C), the complainant need not show that it or one of its licensees practices the patent-in-suit in order for the Commission to find a domestic industry. *See Semiconductor Chips* at 11. However, the complainant must show that there is a "nexus" between the activities upon which it relies and the asserted patent or patents. *Microlithographic Machines* at 346.[28] Additionally, the complainant must show that its investment

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[28] It is worth noting that in *Certain Stringed Musical Instruments and Components Thereof,* the Commission did not specifically refer to the "nexus" requirement. *See* 2008 WL 2139143, Inv. No. 337-TA-586, Commission Opinion at *9 (May 16, 2008). Rather, the Commission stated that "[w]ith respect to section 337(a)(3)(C), the technical prong is the requirement that the activities of engineering, research and development, and licensing are actually related to the asserted intellectual property right." *Id.* Thus, to satisfy what has been previous referred to as the "nexus requirement," it appears that the Commission may only require that the alleged licencing activities under 337(a)(3)(C) are *related* to the asserted patents.

in the exploitation of the patent or patents at issue is "substantial." *See* 19 U.S.C. § 1337(a)(3)(C). "[M]ere ownership of a patent is insufficient to meet the domestic industry requirement."*See* S. Rep. No. 71, 100th Cong., 1st Session at 130 (1987); H.R. Rep. No. 40, 100th Cong., 1st Session, at 157 (1987).

In all cases, the complainant bears the burden of proving the existence of a domestic industry. *Semiconductor Chips*, Inv. No. 337-TA-432, Order No. 13 (Initial Determination) at 5; *Certain Methods of Making Carbonated Candy Products*, Inv. No. 337-TA-292, Commission Opinion at 34-35, USITC Pub. 2390 (June 1991).

B. Analysis

Tessera agues that its licensing activities satisfy the domestic industry requirement under section 337(a)(3)(C). CIB at 38. Tessera argues that since the 2001 decision in ITC Investigation 337-TA-432 finding that Tessera had a domestic industry relating to two of its TCC patents, including the '326 patent at issue in this investigation, Tessera has roughly doubled its number of licensees to its TCC technology. *Id.* at 40. In particular, Tessera asserts that it currently has executed approximately 60 licenses for its TCC technology and that nearly every one of those licenses includes both the '326 and '419 patents. *Id.*

Tessera argues that since 2001, it has earned more than[ ] in licensing revenues relating to its TCC technology. *Id.* at 41. Specifically in 2006, Tessera asserts that it derived approximately [ ] from licensing fees and royalties associated with TCC licenses, including the asserted '326 and '419 patents, with an additional [ ] in revenues derived from settlement awards involving infringement claims based on the asserted patents. *Id.* Tessera also asserts that in the first nine months of 2007, it earned [ ] in royalties and license fees. *Id.*

In support of its TCC technology and licensing program, Tessera asserts that it employs approximately 200 domestic employees at its San Jose, California and Charlotte, North Carolina facilities. *Id.* According to Tessera, its employees are involved in a number of activities related to TCC technology and its licensing, including training TCC licensees and supporting licensing efforts through services such as marketing the technology to potential licensees, negotiating licenses, maintaining Tessera's royalty database, monitoring, and/or auditing royalty payments. *Id.* [

].

Tessera asserts that its in-house attorneys have direct licensing, contract, and enforcement responsibilities relating to Tessera's TCC patent rights, including the asserted '326 and '419 patents. *Id.* at 41-42.

Tessera argues that its substantial investment in its licensing program is tied to the asserted patents. *Id.* at 42. According to Tessera, the '326 and '419 patents both have played specific and important roles in Tessera's licensing program. *Id.* Specifically, Tessera asserts that the '326 and '419 patents have been included in almost every single executed TCC license agreement. Tessera also argues that by asserting the'326 and '419 patents in litigation, it has shown that the '326 and '419 patents are substantial components of its TCC portfolio. *Id.* Further, Tessera assert that the '326 and '419 patents have been specifically requested by potential licensees during negotiations to be included in their licenses. *Id.* at 43.

Respondents argue that Tessera has failed to meet the domestic industry requirement of section 337. RIB at 82. Specifically, Respondents argue that Tessera has failed to present specific evidence that it invests substantial amounts to license the patents at issue. *Id.* at 83. According to

Respondents, to satisfy the domestic industry requirement, Tessera must provide detailed, corroborated evidence of its investment including the respective duties, salaries, responsibilities and percentages of time employees currently devote to relevant licensing activities. *Id.* Respondents argue that without such evidence, there is no way to ascertain the scope or even the existence of Tessera's alleged domestic industry. *Id.* Respondents also argue that Tessera has failed to prove that a nexus exists between Tessera's alleged licensing activities and the asserted '326 and '419 patents. *Id.* at 83. Respondents argue that Tessera's investment in its TCC portfolio cannot substitute for proof of investment in the exploitation of the asserted patents, because Tessera's TCC portfolio includes over 150 patents. *Id.* Respondents argue that Tessera has failed to provide evidence as to what portion of Tessera's alleged licensing activities is attributable to each of the asserted patents, and thus has failed to prove the required nexus. *Id.*

The Staff argues that Tessera has provided ample evidence that it has made a substantial investment in a domestic licencing program that exploits the asserted '326 and '419 patents. SIB at 90. Specifically, the Staff asserts that Tessera maintains a corporate headquarters building in San Jose, California that is approximately 51,000 sq. ft. and a research and development and manufacturing facility in Charlotte, North Carolina that is approximately 100,000 sq. ft. *Id.* at 91. The Staff also asserts that Tessera has approximately 20 to 30 employees engaged in licensing activities with at least four or five of those individuals specifically engaged in licensing the TCC patent portfolio. *Id.* Additionally, the Staff asserts that since 2001 Tessera has generated over[ ] in licensing royalties relating to its TCC. *Id.* According to the Staff, more than [ ] of Tessera's annual revenues are attributed to licensing its TCC portfolio. *Id.* The Staff further asserts that Tessera has licensed its TCC patent portfolio to approximately 62 different companies, and that

[ ]

The Staff also argues that both the '326 and '419 patents have played specific and important roles in Tessera's licensing program. *Id.* On this point, the Staff argues that each of the witnesses that testified on Tessera's behalf regarding its licensing program confirmed that the '326 and '419 patents are often the specific subject of discussion during licensing negotiations. *Id.* Further, the Staff asserts that the '326 and '419 patents have been included in almost every single executed TCC license agreement and that Tessera has specifically relied on the '326 and '419 patents as substantial components of its TCC portfolio licensing program by asserting them in prior litigation. *Id.* at 91-92.

Tessera asserts a domestic industry based on its licensing program under section 337(a)(3)(C). In order to prove that such an industry exists, Tessera must show that it has made a substantial investment in exploiting the patents at issue through its licensing program and that there is a nexus between its licensing program and the asserted '326 and '419 patents. As discussed in detail below, the ALJ finds that Tessera has amply made such a showing.[29]

Tessera designs, develops, markets, and licenses small format semiconductor packaging technology referred to as Tessera Compliant Chip (TCC) technology. *See* CX-3199C (Griffin, Wit. Stat.) at ¶¶ 18-19. Tessera maintains a portfolio of over 150 issued patents related to its TCC technology. CX-3199C (Griffin, Wit. Stat.) at ¶ 19. The '326 and '419 patents at issue in this

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[29] Tessera's domestic licensing program has been at issue in two other ITC investigations, 337-TA-432 and 337-TA-630. The patents at issue in both previous investigations were part of Tessera's TCC portfolio. In both previous investigations, the Commission determined that Tessera had satisfied the domestic industry requirement of section 337. *See Certain Semiconductor Chips with Minimized Chip Package Size & Products Containing Same*, Inv. No. 337-TA-432, Order No. 13 (January 24, 2001) (Commission Decision Not To Review (February 26, 2001)); *Certain Semiconductor Chips with Minimized Chip Package size and Products Containing Same (III)*, Inv. No. 337-TA-630, Order No. 31 (September 16, 2008) (Commission Decision Not To Review (October 8, 2008)).

investigation are part of Tessera's TCC portfolio of patents. *Id.* at ¶ 20; CX-2607C (Pickett, Wit. Stat.) at ¶ 23. The evidence suggests that the '326 and '419 patents are of particular import to Tessera's TCC portfolio and licensing efforts because they are "base patents" that lay the foundation upon which other improvements are built. CX-2607C (Pickett, Wit. Stat.) at ¶¶ 22-23; CX-3199C (Griffin, Wit. Stat.) at ¶ 21. In fact, the evidence shows that the '326 and '419 have been specifically requested by licensees to be included in their licenses. CX-2607C (Pickett, Wit. Stat.) at ¶ 25; Pickett, Tr. 342:24-343:14; CX-3199C (Griffin, Wit. Stat.) at ¶ 25.

In 2001, when ALJ Harris found that Tessera had a domestic industry related to its TCC licensing program, the evidence showed that Tessera had licensed its patents to approximately thirty companies. CX-1653C at 14. Since 2001, the evidence shows that Tessera has roughly doubled its number of licensees to more than sixty companies, including some of the largest semiconductor manufacturers in the world (Intel, Samsung, Hynix, Toshiba, and NEC). CX-2608C (Mitchell, Wit. Stat.) at ¶ 24; CX-3199C (Griffin, Wit. Stat.) at ¶ 22; CX-1637C. During that time frame, Tessera has earned more than [ ] in licensing revenues relating to its TCC technology. CX-2608C (Mitchell, Wit. Stat.) at ¶¶ 51-55; CX-1636C; CX-1660; CX-1661; CX-3667. More specifically, in 2006, the evidence shows that Tessera earned approximately [ ] from licensing fees and royalties associated with TCC licenses that include the asserted patents. CX-2608C (Mitchell, Wit. Stat.) at ¶¶ 42, 64-66; CX-1660 at 38; CX-2607C (Pickett, Wit. Stat.) at ¶¶ 117-125. Additionally, the evidence shows that in the first nine months of 2007, Tessera has generated [ ] in licensing revenue. CX-2608C (Mitchell, Wit. Stat.) at ¶ 71; CX-1661 at 31.

Most of Tessera's licensing activities occur at Tessera's 50,000 square foot San Jose headquarters. CX-2608C (Mitchell, Wit. Stat.) at ¶ 80. The evidence shows that Tessera has

between[ ] and[ ] employees working on patent and licensing activities, including patent attorneys, licensing and business development employees, and support staff. CX-3201C (McWilliams, Wit. Stat.) ¶ 44. Of those, approximately [ ]employees are directly involved in licensing activities, including marketing and engineering support. *See* CX-2608C (Mitchell, Wit. Stat.) at ¶¶ 81-82; *see also* Marcucci, Tr. at 601:7-15 (stating that as VP of business development and licensing at Tessera, he has [ ] people reporting to him that are involved in various aspects of either having licensing discussions or administering the licenses with Tessera's current licensees.). Additionally, the evidence shows that Tessera's in-house attorneys have direct licensing, contract, and enforcement responsibilities relating to Tessera's TCC patent rights, including the asserted '419 and '326 patents. *See* CX-2607C (Pickett, Wit. Stat.) at ¶¶ 8-11; CX-3199C (Griffin, Wit. Stat.) at ¶¶ 9-10, 38-40.

Given the large amount of money and domestic resources Tessera invests toward licensing its TCC packaging technologies, including the '326 and '419 patents, the ALJ finds that Tessera actively exploits its intellectual property and that such investments are clearly substantial. Additionally, because Tessera's TCC portfolio includes the asserted patents, and the evidence shows those patents to be of particular import to Tessera's licensing efforts, the ALJ finds a nexus exists between Tessera's TCC licensing program and the asserted '326 and '419 patents.[30] Accordingly, the ALJ finds that Tessera has proven by a preponderance of the evidence the existence of a domestic industry related to its TCC patent licensing business that exploits the patents at issue in this investigation and satisfies the requirements of section 337(a)(3)(C).

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[30] In Investigation 337-TA-630, the Commission affirmed the ALJ's finding of a nexus between Tessera's TCC licensing activities and the asserted patents based only on the fact that the asserted patents were part of Tessera's TCC patent portfolio. *Certain Semiconductor Chips with Minimized Chip Package size and Products Containing Same (III)*, Inv. No. 337-TA-630, Order No. 31 (September 16, 2008) (Commission Decision Not To Review (October 8, 2008)).

CONCLUSIONS OF LAW

1. The Commission has subject matter jurisdiction in this investigation.

2. The Commission has personal jurisdiction over Respondents Spansion, Inc., Spansion, LLC, QUALCOMM, Inc., ATI Technologies, ULC, Motorola, Inc., STMicroelectronics N.V., and Freescale Semiconductor, Inc.

3. Respondents' accused products do not infringe claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326.

4. Respondents' accused products do not infringe claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419.

5. Claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 are not invalid for failing to satisfy the enablement requirement of 35 U.S.C. § 112 ¶ 1.

6. Claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 are not invalid for failing to satisfy the enablement requirement of 35 U.S.C. § 112 ¶ 1.

7. Claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 are not invalid for failing to satisfy the written description requirement of 35 U.S.C. § 112 ¶ 1.

8. Claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 are not invalid for failing to satisfy the written description requirement of 35 U.S.C. § 112 ¶ 1.

9. Claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 are not invalid as indefinite under 35 U.S.C. § 112 ¶ 2.

10. Claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 are not invalid as indefinite under 35 U.S.C. § 112 ¶ 2.

11. Claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 are not invalid under 35 U.S.C. § 102 for anticipation.

12. Claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 are not invalid under 35 U.S.C. § 102 for anticipation.

13. Claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 are not invalid under 35 U.S.C. § 103 for obviousness.

14. Claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419 are not invalid under 35 U.S.C. § 103 for obviousness.

15. An industry in the United States exists with respect to Tessera Technology, Inc.'s Licensing Program that has a nexus to U.S. Patent No. 5,852,326 and U.S. Patent No. 6,433,419 as required by 19 U.S.C. § 1337(a)(2) and (3).

INITIAL DETERMINATION

Based on the foregoing, it is the INITIAL DETERMINATION ("ID") of this Tribunal that no violation of section 337 of the Tariff Act of 1930, as amended, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain semiconductor chips with minimized chip package size and products containing same by reason of infringement of one or more of claims 1, 2, 6, 12, 16-19, 21, 24-26, and 29 of U.S. Patent No. 5,852,326 and claims 1-11, 14, 15, 19, and 22-24 of U.S. Patent No. 6,433,419.

Further, this Initial Determination, together with the record of the hearing in this investigation consisting of:

(1) the transcript of the hearing, with appropriate corrections as may hereafter be ordered, and

(2) the exhibits received into evidence in this investigation, as listed in the attached exhibit lists, is CERTIFIED to the Commission.

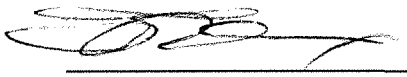
In accordance with 19 C.F.R. § 210.39(C), all material found to be confidential by the undersigned under 19 C.F.R. § 210.5 is to be given *in camera* treatment.

The Secretary shall serve a public version of this ID upon all parties of record and the confidential version upon counsel who are signatories to the Protective Order (Order No.1) issued in this investigation, and upon the Commission investigative attorney.

To expedite service of the public version, each party is hereby ORDERED to file with the Commission Secretary by no later than December 10, 2008, a copy of this ID with brackets that show any portion considered by the party (or its suppliers of information) to be confidential, accompanied by a list indicating each page on which such a bracket is to be found. At least one copy of such a

filing shall be served upon the Administrative Law Judge, and the brackets shall be marked in red. If a party (and its suppliers of information) considers nothing in the ID to be confidential, and thus makes no request that any portion be redacted from the public version of this ID, then a statement to that effect shall be filed in lieu of a document with brackets.

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission unless a party files a petition for review pursuant to § 210.43(a) or the Commission, pursuant to § 210.44, orders on its own motion a review of the ID or certain issues herein.



Theodore R. Essex
Administrative Law Judge

RECOMMENDED DETERMINATION ON REMEDY AND BOND

Pursuant to Commission Rules 210.36(a) and 210.42(a)(1)(ii), the Administrative Law Judge is to consider evidence and argument on the issues of remedy and bonding and issue a recommended determination thereon.

X. Remedy and Bonding

A. Limited Exclusion Order

Under Section 337(d), the Commission may issue either a limited or a general exclusion order. A limited exclusion order instructs the U.S. Customs Service to exclude from entry all articles that are covered by the patent at issue and that originate from a named respondent in the investigation. A general exclusion order instructs the U.S. Customs Service to exclude from entry all articles that are covered by the patent at issue, without regard to source.

Tessera requests that a limited exclusion order issue barring the entry into the United States those products Tessera has accused of infringement in this investigation that are manufactured by or on behalf of, or imported by or on behalf of, Respondents and/or any of their principals, stockholders, officers, directors, employees, agents, licensees, distributors, affiliates, subsidiaries, related companies, and successors and assigns. CIB at 80.

Respondents argue that should a violation of Section 337 be found that any exclusion order issued should be limited to only those semiconductor chip manufacturers specifically found to violate Section 337. RIB at 84. Respondents also argue that inasmuch as a semiconductor chip package can only infringe when mounted on a printed circuit board (PCB), any exclusion order must be limited to chip packages that are mounted on PCBs, and not un-mounted chip packages. *Id.* at 84-85.

Although the ALJ has not found a violation of Section 337, should the Commission determine that a violation exits, the ALJ finds that a limited exclusion order would be properly directed to Respondents' accused chip packages that are manufactured by or on behalf of, or imported by or on behalf of, Respondents and/or any of their principals, stockholders, officers, directors, employees, agents, licensees, distributors, affiliates, subsidiaries, related companies, and successors and assigns. Additionally, as a named respondent, Motorola products containing accused semiconductor chip assemblies are themselves accused in this Investigation. *See* 72 FR 28521(May 21, 2007) (Notice of Investigation). Therefore, should the Commission find a violation of section 337, any limited exclusion that issues should reach Motorola products that incorporate Respondents' infringing chip assemblies. *See* 19 U.S.C. §1337(d)(1)("If the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States."). Respondents argument that any limited exclusion order that issues should be limited to semiconductor chips that are mounted to PCB boards is unpersuasive. Notably, the '326 patent does not include a limitation requiring that the semiconductor chip be attached to a PCB substrate. As construed herein, the asserted claims of the '326 patent only require that "the terminals *are capable* of being displaced relative to the chip by external loads[31] applied to the terminals." *See*, *supra*, at V.D.4. (emphasis added).

B. Downstream Products

Tessera requests that any exclusion order not only cover any chip assemblies that are found to infringe, but also cover certain "downstream products" that incorporate the infringing chip

[31] Recall that under Tessera's infringement theory, the external load comes from the PCB substrate.

assemblies. CIB at 81. Tessera argues that because the vast majority of the products it has accused of infringement are imported into the United States only after they are incorporated into downstream products, downstream relief is essential to protect Tessera from infringing imports. *Id.*

Subsequent to the filing of post-hearing briefs in this investigation, the Federal Circuit issued its opinion in *Kyocera Wireless Corp. v. Int'l Trade Comm'n*, which addressed, among other things, the issue of downstream remedies under Section 337. *See Kyocera Wireless Corp. v. Int'l Trade Comm'n*, 2008 WL 4553140 (Fed. Cir. Oct. 14, 2008). The Federal Circuit held, unambiguously, that under Section 337, the Commission is prevented "from issuing a limited exclusion order that excludes products of those who are not 'persons determined ... to be violating [Section 337].'" *Id.* at *16. Thus, according to the Federal Circuit, a limited exclusion order may only exclude downstream products of named respondents. *Id.*

In the present investigation, Motorola is the only named Respondent who imports downstream products. Accordingly, based on the Federal Circuit's holding in *Kyocera Wireless*, any LEO that issues in this investigation that covers downstream products must be limited to those downstream products imported by Motorola. *See Kyocera Wireless*, 2008 WL 4553140 at *16. As previously stated, as a named respondent, Motorola products containing accused semiconductor chip assemblies are themselves accused in this investigation. Thus, should the Commission find a violation of Section 337 and issue a limited exclusion order, that order should reach Motorola products that incorporate Respondents' infringing chip assemblies

C. Cease and Desist Order

Under Section 337(f)(1), the Commission may issue a cease and desist order in addition to, or instead of, an exclusion order. Cease and desist orders are warranted primarily when the

respondent maintains a commercially significant inventory of the accused products in the United States. Tessera requests that the Commission issue cease and desist orders against Motorola, Qualcomm, Freescale and Spansion, as each maintains a commercially significant inventory of infringing goods in the United States. CIB at 98.

The Court agrees that the evidence shows that Respondents Motorola, Qualcomm, Freescale and Spansion maintain commercially significant inventory of infringing goods in the United States and that if a violation of Section 337 is found, a cease and desist order is warranted. *See* JX-244C at 118-119 (Motorola); CX-1328C (Qualcomm); CX-1229C (Freescale); CX-1847C (Spansion).

D. Bond During Presidential Review Period

If the Commission enters an exclusion order or cease and desist order, parties may continue to import and sell their products during the pendency of the Presidential review under a bond in an amount determined by the Commission to be "sufficient to protect the Complainants from any injury."

Tessera argues that because it does not compete with Respondents, it is not possible to directly compare the price of Tessera's patented product and Respondents' infringing products for purposes of determining the bond. CIB at 98. Additionally, Tessera argues that there is no pre-established U.S.-only royalty rate for the patents-in-suit and that in any event, the royalty calculation would vary depending on the particular type of infringing chip package at issue and the downstream products into which they are incorporated. *Id.* at 99. Accordingly, Tessera argues that the bond should be set at 100% of entered value of the infringing articles. *Id.* at 98-99. However, Tessera does acknowledge that a 100 percent bond may not be appropriate for some downstream products. Thus, to the extent that downstream producers are required to post a bond, Tessera agrees to adopt

Respondents' expert's figure of 3.5% as the median royalty in the semiconductor industry, and suggests that the bond for downstream products be no less than 3.5% of the entered value of the downstream product. *Id.* at 99.

Respondents argue that the median royalty rate in the semiconductor chip industry is 3.5%, which exceeds the average effective rate of Tessera's licenses. RIB at 93. Therefore, Respondents argue that if necessary, the Commission should set a bond no greater than 3.5% of chip assembly price. *Id.*

The Staff argues that the bond should be determined based on a reasonable royalty rate. SIB at 96-97. Specifically, the Staff argues that the evidence shows that the median royalty rate in the semiconductor industry is 3.5%. *Id.* Thus, the Staff argues that any bond should be set at 3.5%. *Id.*

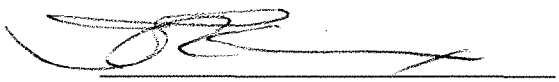
The Commission frequently sets the bond by attempting to eliminate the difference in sales prices between the patented domestic product and the infringing product. In the absence of reliable price information, the Commission has used other methods to determine an appropriate bond. For example, where a price comparison is unworkable, the Commission has determined that a bond of 100% is appropriate. *See, e.g., Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, U.S.I.T.C. Pub. No. 3003, Comm'n Op. at 27-28 and 40 (U.S.I.T.C., September 23, 1996). In other instances where a direct comparison between a patentee's product and the accused product was not possible, the Commission has set the bond at a reasonable royalty rate. *See, e.g., Certain Digital Satellite System (DSS) Receivers and Components Thereof*, Inv. No. 337-TA-392, U.S.I.T.C. Pub. No. 3418, Initial and Recommended Determinations at 245, *vacated on other grounds*, Comm'n Determination (May 13, 1999), 2001 WL 535427 (U.S.I.T.C., October 20, 1997).

Tessera does not compete with Respondents, so a direct cost comparison between a patented domestic product and an accused product is not possible. However, the evidence shows that the median royalty rate in the semiconductor industry was 3.5%. *See* RX-3350C (Mulhern, Wit. Stat.) at ¶¶ 159-160; *see also* RFF XI.238 (no objection). Accordingly, the ALJ recommends that if a violation of Section 337 is found that a bond be set in the amount of 3.5% the value of the imported accused products.

Within seven days of the date of this document, each party shall submit to the office of the Administrative Law Judge a statement as to whether or not it seeks to have any portion of this document deleted from the public version. The parties' submissions must be made by hard copy by the aforementioned date.

Any party seeking to have any portion of this document deleted from the public version thereof must submit to this office a copy of this document with red brackets indicating any portion asserted to contain confidential business information. The parties' submission concerning the public version of this document need not be filed with the Commission Secretary.

SO ORDERED.



Theodore R. Essex
Administrative Law Judge