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CLASSIFICATION OF THE PENTIUM II CPU

(Item IX.14 on the Agenda)

Reference :

42.461 (HSC/22)
42.733 (HSC/22)
42.750 Annex H/13 (HSC/22 – Report)

I. BACKGROUND

1. The classification of the Intel Pentium ® II microprocessor or central processing unit (CPU) was placed on the agenda of the 22nd Session of the Harmonized System Committee by the Korean Administration. At the request of the Delegate of the EC, the Committee agreed to postpone this item to the 23rd Session. On 1 April 1999, the Secretariat received the following Note from the United States Administration.

II. NOTE FROM THE UNITED STATES

2. "The classification of the Intel Pentium ® II microprocessor or central processing unit (CPU) was placed on the Committee's agenda by Korea. The issue presented is whether the Pentium ® II is classified as an electronic integrated circuit of heading 85.42, a separately presented unit for an ADP machine of heading 84.71, or as a part for an ADP machine of heading 84.73.

Description of Merchandise :

3. According to the manufacturer, the Pentium ® II consists of a substrate on which various active and passive elements are affixed. The substrate consists of alternating layers of non-conductive and conductive materials. The conductive layers consist of copper foil on which circuitry is formed by a printing and etching process. Printing and etching is accomplished by placing a photosensitive emulsion on the copper foil. The emulsion is exposed using a photo negative. An image is developed by removing the unexposed portions of the emulsion. The exposed copper is etched to form conductive circuitry.

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4. Thereafter, holes are drilled in the substrate and a thin copper layer is plated to the inside of the holes. The copper plated holes intersect with the etched circuitry to form interconnections between the layers of the substrate.

5. Passive elements are subsequently affixed to both sides of the substrate. These passive elements include components such as capacitors and resistors.

6. Active elements, consisting of integrated circuits or chips, are also affixed to both sides of the substrate. These components control the data that travels through the processor. The chips are monolithic integrated circuits which are composed of passive and active elements that are inseparably associated on semiconductor materials. The chips include the core processor, which controls the arithmetic and logic functions, and four cache chips, which are memory chips that store data and instructions. Finally, a tag RAM chip is added to control and access the cache memory chips.

7. The Pentium ® II is packaged in a cartridge and connects to the motherboard by means of a single edge connector that is located on one side of the substrate.

Classification :

8. Note 5 to Chapter 85 indicates that if an article is classifiable in heading 85.42, it cannot be classified elsewhere in the Nomenclature. Therefore, we must first determine whether the Pentium ® II is classifiable in heading 85.42. If the device is classifiable in that heading, it cannot be classified in other headings such as 84.71 or 84.73.

9. Heading 85.42 provides for "electronic integrated circuits and microassemblies". Note 5(B) to Chapter 85 states that these devices are either "monolithic integrated circuits", "hybrid integrated circuits" or "microassemblies of the moulded module, micromodule or similar types".

10. Note 5(B)(a) defines the expression "monolithic integrated circuits" for purposes of heading 85.42 :

> "Monolithic integrated circuits in which the circuit elements (diodes, transistors, resistors, capacitors, interconnections, etc.) are created in the mass (essentially) and on the surface of a semiconductor material (doped silicon, for example) and are inseparably associated. " (Emphasis supplied).

11. Part (I)(1) of the Explanatory Note to heading 85.42 states that :

> "Certain monolithic integrated digital circuits of this group are used as central processing units (known as "microprocessors"), memories, etc."

12. The Pentium ® II is a central processing unit or microprocessor. However, it is composed of a substrate to which various passive and active components have been subsequently affixed. Consequently, the device has not been "created in the mass" as required by Note 5(B)(a) to Chapter 85. For this reason, the Pentium ® II cannot be classified as a monolithic integrated circuit of heading 85.42.

13. Microassemblies of heading 85.42 are defined at Note 5(B)(c) to Chapter 85 :

> "Microassemblies of the moulded module, micromodule or similar types, consisting of discrete, active or both active and passive, components which are combined and interconnected." (Emphasis supplied).

14. Part II of the Explanatory Note to heading 85.42 explains that microassemblies are made from "discrete...components which are combined and interconnected." The Explanatory Note further states that "discrete components are indivisible and are the basic electronic construction components in a system". By way of contrast, integrated circuits are not discrete components because they have "multiple electrical functions". The Pentium ® II is a device which contains components, such as integrated circuits, which are not discrete components. Accordingly, it cannot be classified as a microassembly of heading 85.42.

15. Note 5(B)(b) to Chapter 85 defines the expression "hybrid integrated circuits" for purposes of heading 85.42 :

> "Hybrid integrated circuits in which passive elements (resistors, capacitors, interconnections, etc.), obtained by thin- or thick-film technology, and active elements (diodes, transistors, monolithic integrated circuits, etc.), obtained by semiconductor technology, are combined to all intents and purposes indivisibly, on a single insulating substrate (glass, ceramic, etc.). These circuits may also include discrete components." (Emphasis supplied).

16. According to the legal note, hybrid integrated circuits must include at least some passive elements that are obtained by thin or thick film technology.

17. Part (I)(2) of the Explanatory Note to heading 85.42 states in part that hybrid integrated circuits are :

> "microcircuits built-up on an insulating substrate on which a thin or thick film circuit has been formed. This process allows certain passive elements (resistors, capacitors, interconnections, etc.) to be produced at the same time". (Emphasis supplied).

18. Taken together, the legal note and the Explanatory Note indicate that a hybrid integrated circuit must be built on a substrate on which passive components are formed by thin or thick film technology. The Pentium ® II is built on a substrate on which passive components (*i.e.,* interconnections) are formed. However, for the Pentium ® II to be classified as a hybrid integrated circuit, the passive components formed on the substrate must have been formed by thin or thick film technology.

19. Thin or thick film circuits are described in the Explanatory Note to heading 85.34 :

> "Thin-film circuits are formed by the deposition on glass or ceramic plates of specific patterns of metallic and dielectric film, by vacuum evaporation, cathode sputtering or chemical methods. The patterns may be formed by deposition through masks or by deposition of a continuous sheet with subsequent selective etching.
>
> Thick-film circuits are formed by screen-printing onto ceramic plates of similar patterns, using pastes (or inks) containing mixtures of powdered glass, ceramics and metals with suitable solvents. The plates are then furnace-fired". (Emphasis supplied).

20. The Explanatory Notes indicate that thin and thick film circuits are formed by depositing or otherwise applying (*e.g.,* screen printing) patterns of film on a plate. The interconnections on the substrate have not in this case been deposited or applied by thin or thick film technology. Rather, these interconnections or circuits have been obtained by printing and etching copper foil.

21. In paragraph 6 of Doc. 42.733, the manufacturer states that the circuits on the substrate are formed by thick film technology. According to the manufacturer, thick-film technology is characterized by the use of a lithography process.

22. We can agree that the substrate in this case has been manufactured using a lithographic process. However, according to the Explanatory Notes and the McGraw-Hill Encyclopedia, a thick film circuit is formed using a particular lithographic process. That lithographic process involves the application of circuit patterns by screen printing. The substrate for the Pentium ® II has not been produced in this manner. Accordingly, the Pentium ® II is not a hybrid integrated circuit of heading 85.42 because it does not possess a substrate on which thin or thick film circuits have been formed.

23. For the foregoing reasons, the Pentium ® II cannot be classified as an electronic integrated circuit or microassembly of heading 85.42.

24. Heading 84.71 provides for automatic processing machines and units thereof. Pursuant to Note 5(B) to Chapter 84, we could consider classifying the Pentium ® II in heading 84.71 as a separately presented unit for an ADP machine. In paragraph 10 of Doc. 42..461, the Secretariat points out that central processing units are covered by heading 84.71 as an example of a digital data processing machine that is a separately housed unit. However, the Explanatory Notes state that central processing units incorporate "the main storage, the arithmetical and logical elements and the control elements". The Pentium ® II contains arithmetical and logical elements. However, it does not include the main storage, nor does it include all of the control elements. Although the Pentium ® II is sometimes referred to as a "central processing unit", it is not a CPU as that term appears to be used in the Explanatory Note to heading 84.71. Therefore, it cannot be classified as a separately presented unit of heading 84.71.

25. Pursuant to Note 2(b) to Section XVI, parts that are not specifically provided for in the headings of Chapters 84 and 85, and that are suitable for use solely or principally with an ADP machine, are classified in heading 84.73. The Pentium ® II processor is classified as a part for an ADP machine of subheading 8473.30 because it is not more specifically described elsewhere in the Nomenclature."

III. CONCLUSION

26. Copies of the documentation provided by the United States Administration in support of its position will be available in the Meeting Room (English version only).

27. The Committee is invited to take account of the Note from the United States while examining this Agenda Item.