ENERGY STAR® Program Requirements for Computer Servers

Draft 1 Version 2.0
Power and Performance Datasheet

The following pages are a draft re-formatting of the ENERGY STAR Power and Performance Datasheet (PPDS). It is EPA's goal to institutionalized uniform disclosure of system information and power and performance data to help end users identify the most efficient system for their anticipated needs. EPA established the PPDS in Version 1.0 of the program accordingly and this document presents proposed modifications to the format of the datasheet to incorporate efficiency rating results, refined power and performance disclosure, and stakeholder suggestions.

This document represents a single configuration datasheet and is intended to foster comments on the content of the document. Future versions accompanying drafts will extend into families once the format is established. Below are descriptions of the elements of the document.

Page 1

Page 1 contains hardware information on the qualified server. Sections are designed to collapse for readability with each header button and cells colors change based on data input. EPA proposes linking data input on these forms from the QPI (if one remains in use) to minimize duplicated data entry and is open to suggestions on ways to improve population of the datasheet.

Page 2

Efficiency Rating: Page 2 addresses power and performance information for the system. At the top of the page is the structure to present efficiency rating tool results. While subsystem test results are disclosed in the top diagram, the foundation for the data is the full test report. The full report will be provided as a link in the center of the graphics. A full disclosure requirement is referenced in the footnote to this section.

Power Profile: While not necessarily the focus of the efficiency rating tool, idle and max power do aid in identification of a server's power profile. This data will continue to be collected and will be presented graphically.

Power-Performance Benchmark Disclosure: Benchmark power-performance result disclosure remains a requirement in this datasheet proposal. In Version 2.0, benchmarks will need to be present in a list of pre-determined options to be used in this section. EPA believes that inclusion of power-performance results from benchmarks targeted at application types will supplement the more general efficiency rating results.

Page 3

Page 3 lists operational information about the server: thermal information, power management capability, etc. Added at the bottom of the page is a chart with inlet air temp vs. fan power. An end user stakeholder suggested that such information would be useful in determining the impact of raising data center ambient temperature on the power necessary to expel heat from the server.

At the bottom of the form, a note box is included to record additional information at the manufacturer's discretion (e.g., product availability, additional options not listed elsewhere in the form).

ENERGY STAR® *Power and Performance Data Sheet*
A125

System Characteristics

Form Factor	2U
Operating Systems Supported	Microsoft Windows Server 2003 and 2008 Red Hat Enterprise Linux 4 and 5
Installed Operating System for Testing	Windows Server 2008 Enterprise SP1, Build 6001
Available Expansion Slots	Up to 6 PCI-E and up to 2 PCI-X

Processor

Available Processor Sockets	2
Processor Information	Intel® Xeon® X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) Intel® Xeon® X3400
Processor Configuration Notes	The A125 server processor options offer quad core performance tuned to produce efficient performance in a virtualized datacenter. Supported features include: - Enhanced Dynamic Frequency Scaling - Hyper-Threading - Virtualization Support - HyperTransport Support - Integrated Memory Controller

Memory

Available DIMM Slots	18
Max Memory Capacity (GB)	128
ECC and/or Fully Buffered DIMMs	Yes, ECC and Registered DIMM (RDIMM) memory
Memory Information	12 GB (6 x 2 GB) PC3-10600R (DDR3-1333) Registered DIMMs

Storage/Disk

Minimum / Maximum # of Hard Drives/SSDs	0 / 10
Internal Storage Options	None

Power Supplies

Redundant Power Supply Capable?	Yes
Power Supply Make and Model	PowerCo A12345 750 W
Power Supply Output Rating* (watts)	750
Minimum and Maximum # of Power Supplies	1 / 2
Input Power Range (AC or DC)	100-240VAC
Power Supply Efficiency at Specified Loadings*	86.1% @10% load, 90% @20% load, 92.5% @50% load, 91.5% @100% load
Power Supply Power Factor at Specified Loadings*	0.792 @10% load, 0.86 @20% load, 0.93 @50% load, 0.965 @100% load

*** Note: Power supply information is for a single power supply only**

I/O

I/O Devices	Two HP NC382i Dual Port Multifunction Gigabit Server Adapters

Other Features

Power Supply Number and Redundancy Configuration	2 Installed, Redundant
Management Controller or Service Processor Installed?	Yes
Other Hardware Features / Accessories	- Centrally-Controlled Chassis Cooling - PMBus™ Support - Integrated KVM and LCD Console

Efficiency Rating *

CPU Rating	85
Memory Rating	72
I/O Rating	90
Disk Rating	80
ENERGY STAR Efficiency Rating	81.75
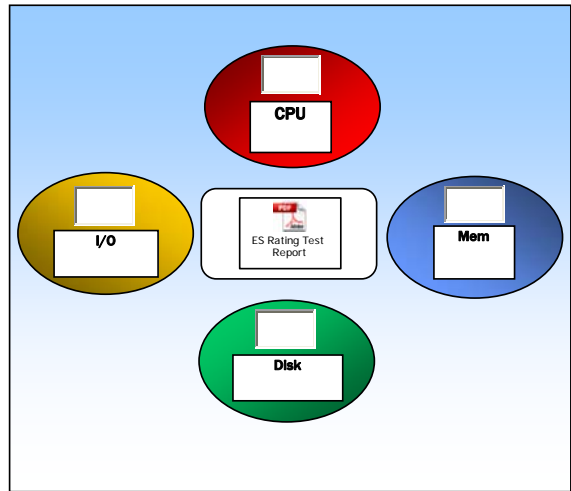
Notes:

For complete ENERGY STAR active mode efficiency results, please refer to the SERT test report attached to this datasheet.

The A125 was tested under strict laboratory control compliant with ENERGY STAR's required conditions.

Please refer below to supplemental power and performance benchmark information.

* ENERGY STAR Rating Information may be disclosed only in full. Partners are prohibited from selectively disclosing workload module results independently or otherwise outside the context of the full test report.

Power Profile

|	
Measured Idle Power (watts)	138.9
Measured Power at 50% Load (watts)	150
Power at Full Load* (watts)	270.8
Benchmark / Method Used for Full Load Test	SERT
Test Voltage and Frequency for Idle and Full Load Test	230V/50Hz
Range of Total Estimated Energy Usage ** (kWh/year)	2,434 to 4,744
Energy Cost (cents/kWh)	9.6
Range of Total Annual Energy Cost ($US)	234 to 455
Link to Detailed Power Calculator (if available)	www.company.com/calc

Power Profile
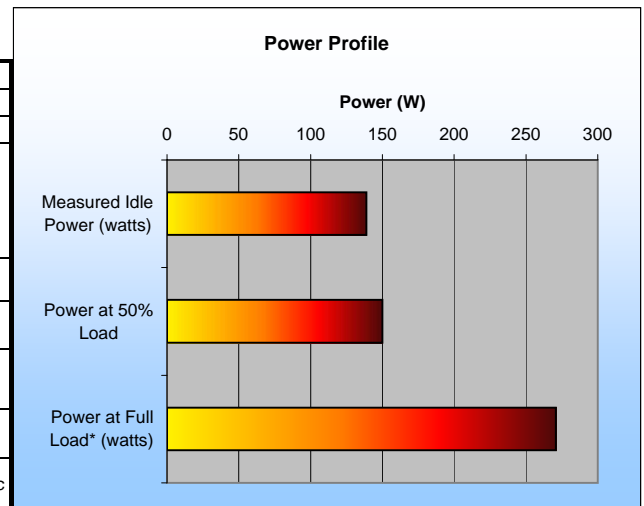
Power (W)

* Note: Full load power represents the sustained, average power at 100% load of the given workload, and does not necessarily represent the absolute peak power or the highest average, sustained power possible for other workloads.

** Note: Estimated kWh/year gives the absolute range of energy use a user could expect from continuous operation (24x7x365) and ranges from 100% Idle usage to 100% full load operation. The calculation also includes typical data center overhead at a ratio of 1 watt of overhead to every 1 watt of IT load (corresponding to a PUE of 2.0). Closer approximations may be found by using established power calculators and specific information about the intended operating environment (e.g., average time at Idle, data center PUE, etc.).

Power-Performance Benchmark Disclosure

Benchmark Used and Type of Workload	SPECpower_ssj
Avg. Power Measured During Benchmark Run	246.3
Maximum Load (Operations)	N/A
Benchmark Performance Score	993 ops/W
Power Performance Ratio (perf score/avg. power)	993 ops/W
Link to Full Benchmark Report (Where Available)	N/A

Benchmark #1

Power and Performance
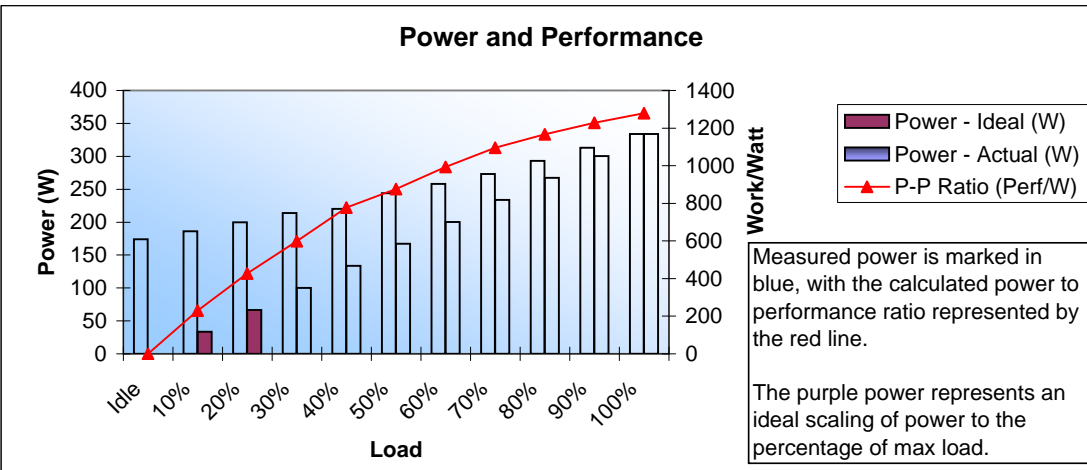
Measured power is marked in blue, with the calculated power to performance ratio represented by the red line.

The purple power represents an ideal scaling of power to the percentage of max load.

Power Saving Features

|	Enabled on Shipment	End-User Enabling Required
Processor Dynamic Voltage and Frequency Scaling	Yes	
Processor or Core Reduced Power States	Yes	
Power Capping	Yes	
Variable Speed Fan Control Based on Power or Thermal Readings		Yes
Low Power Memory States	Yes	
Low Power I/O States	Yes	
Liquid Cooling Capability		
Other1:		
Energy Efficient Ethernet Compliant	Yes	
Other3:		
Other4:		

Power and Temperature Measurement and Reporting

Input Power Available & Accuracy?	Yes, +/- 10% above 200W and +/-30W at or below 200W
Input Air Temp Available & Accuracy?	Yes, +/- 3 ºC
Processor Utilization Available?	Yes
Other Data Measurements Available & Accuracy?	
Compatible Protocols for Data Collection	IPMI
Averaging method and time period	Linear Average

Thermal Information *

	Minimum	Typical	Maximum
Reference Configurations		1xL5520; 2x2GB PC10600E; 1x120GB 5400RPM SFF SATA, 1x460W PS	
Total Power Dissipation (watts)		129.9	
Delta Temperature at Exhaust at Peak Temp. (˚C)		10.1	
Airflow at Maximum Fan Speed (CFM) at Peak Temp.		23.0	
Airflow at Nominal Fan Speed (CFM) at Nominal Temp.		9.5	

* Thermal information is provided for the minimum, typical and maximum configurations for the model line
  References: ASHRAE Extended Environmental Envelope Final August 1, 2008
      Thermal Guidelines for Data Processing Environments, ASHRAE, 2004, ISBN 1-931862-43-5

Inlet Air Temp vs. Fan Power
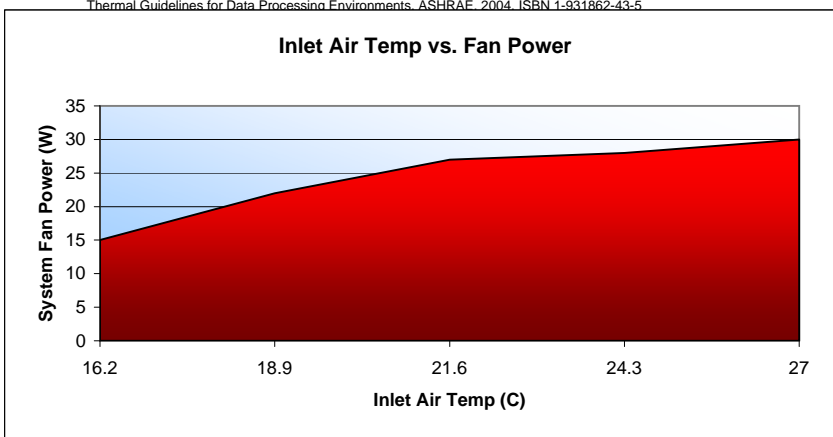
Notes:

The A125 is designed to provide industry-leading performance with the top-tier efficiency expected of an ENERGY STAR server. Available options allow this server to be used as a stand-alone application server or in large scale-out environments – multiple local storage options and hardware virtualization support provide a platform to address a wide range of business requirements. Extended RAS options are offered to ensure maximum uptime in critical applications. The A125 is offered with standard remote access software, allowing for maintenance and management from a standard web browser or remote console without the need to visit the server.

For a full description of the unique features of this solution, please visit visit our website at www.___.com

Ideal Applications: Web serving, e-business, and virtualization.