

ENERGY STAR® Power and Performance Data Sheet
HP DL160Gen8 2P E5-2609 500W



System Characteristics

Form Factor	1u rack (CTO chassis 666282-B21)
Available Processor Sockets	2
Available DIMM Slots / Max Memory Capacity	24 slots / 384GB
ECC and/or Fully Buffered DIMMs	both
Available Expansion Slots	3
Minimum and Maximum # of Hard Drives	1 to 4
Redundant Power Supply Capable?	yes
Power Supply Make and Model	HP 622381-101
Power Supply Output Rating* (watts)	500W
Minimum and Maximum # of Power Supplies	1
Input Power Range (AC or DC)	100-240V /
Power Supply Efficiency at Specified Loadings*	86.53 @10%,90.47 @20%,92.01 @50%,89.01 @100%
Power Supply Power Factor at Specified Loadings*	0.99@10%,1.00 @20%, 1.00 @50%, 1.00 @100%
Operating Systems Supported	Microsoft Windows Server 2008, Standard Edition (x86 and x64) - SP2 and R2 w/ SP1
Installed Operating System for Testing	Windows 2008 Server R2

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

System Configurations

	Minimum	Typical	Maximum
Configuration ID			
Processor Information	2 x E5-2603	2 x E5-2609	2 x E5-2609
Memory Information	4GB (2 x 2GB 1Rx8 PC3L-10600E)	32GB (4 x 8GB 1Rx4 PC3 12800R)	384GB (24 x 16GB 2Rx4 PC3-12800R)
Internal Storage	1 x 250GB LFF SATA	1 x 250GB SATA; 1 x 3TB 6G SATA	1 x 250GB SATA; 2 x 3TB 6G SATA; 1 x 2TB 6G SATA
I/O Devices	ALOM 4 port 1GB	ALOM 4 port 1GB	NC375T; P420; ALOM 2 port 10GB
Power Supply Number and Redundancy Configuration	1 (non-redundant)	1 (non-redundant)	1 (non-redundant)
Management Controller or Service Processor Installed?	Yes	Yes	Yes
Other Hardware Features / Accessories			

Power Data

	Minimum	Typical	Maximum
Idle Category (1S and 2S only)	Category D: Managed Dual Installed Processor (2P) Servers		
ENERGY STAR Idle Power Allowance (1S and 2S only)	158W	222W	946W
Measured Idle Power (watts)	73.8	85.3	150.1
Power at Full Load* (watts)	92.6	119.7	184.8
Benchmark / Method Used for Full Load Test	SI Software Sandra Engineer - .net multimedia		
Test Voltage and Frequency for Idle and Full Load Test	230V / 50 Hz		
Range of Total Estimated Energy Usage ** (kWh/year)	1,293 to 1,622	1,494 to 2,097	2,630 to 3,238
Link to Detailed Power Calculator (if available)			

* 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 and Performance for Benchmark #1

	Minimum	Typical	Maximum	
Benchmark #1	Benchmark Used and Type of Workload			
	SI Software Sandra Engineer - .net multimedia			
	Avg. Power Measured During Benchmark Run	92.6	119.7	184.8
	Benchmark Performance Score (Mpix/s)	22	30	30
	Power Performance Ratio (Mpix/sec/W)	0.23	0.24	0.16
Link to Full Benchmark Report (Where Available)				

Power and Performance for Benchmark #2 (optional)

	Minimum	Typical	Maximum
Benchmark #2	Benchmark Used and Type of Workload		
	Avg. Power Measured During Benchmark Run		
	Benchmark Performance Score		
	Power Performance Ratio (perf score/avg. power)		
	Link to Full Benchmark Report (Where Available)		

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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	No	Yes
Variable Speed Fan Control Based on Power or Thermal Readings	Yes	
Low Power Memory States	No	Yes
Low Power I/O States	N/A	
Liquid Cooling Capability	N/A	
Other1:		
Other2:		
Other3:		
Other4:		

Power and Temperature Measurement and Reporting

Input Power Available & Accuracy?	+/- 5% with 10W cutoff
Input Air Temp Available & Accuracy?	+/- 3C
Processor Utilization Available?	Yes
Other Data Measurements Available & Accuracy?	
Compatible Protocols for Data Collection	iLo4
Averaging method and time period	Linear average

Thermal Information *

	<i>Minimum</i>	<i>Typical</i>	<i>Maximum</i>
Total Power Dissipation (watts)	82.0	232.0	445.0
Delta Temperature at Exhaust at Peak Temp. (°C)	22.0	18.8	24.4
Airflow at Maximum Fan Speed (CFM) at Peak Temp.	12.1	39.9	59.2
Airflow at Nominal Fan Speed (CFM) at Nominal Temp.	12.0	16.5	16.2

* References: ASHRAE Extended Environmental Envelope Final August 1, 2008
 Thermal Guidelines for Data Processing Environments, ASHRAE, 2004, ISBN 1-931862-43-5
 Peak temperature is defined as 35 °C, Nominal Temperature is defined as 18 - 27 °C

Notes

1. SPECpower_ssj2008 is a registered trademark of the Standard Performance Evaluation Corporation (SPEC). Benchmark results stated above reflect results published on XX/XX/XX. For the latest SPECpower_ssj2008 benchmark results, visit http://www.spec.org/power_ssj2008.

ENERGY STAR Qualified Configurations

Include specific information on ENERGY STAR Qualified SKUs or configurations

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Page 3 of 3



ENERGY STAR Qualified Configurations (Continued)

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