## Overview

HPE DDR4 SmartMemory

When you choose HPE DDR4 SmartMemory, you get great performance, reliability, and efficiency that provides the compatibility, capacity and bandwidth you need to productively manage your expanding workload with the HPE ProLiant Gen9 server, Apollo Family, Synergy and Blade Systems. The quality and reliability of DRAM are more important now than ever, as data center trends such as server virtualization, cloud computing, the use of large database applications, have all increased the need for higher capacity memory with greater uptime.

HPE SmartMemory goes through rigorous qualification and testing processes that unlock extended memory performance features available only with Hewlett Packard Enterprise Gen9 servers. This extensive testing ensures that HPE server memory is completely compatible with and optimized for HPE servers.
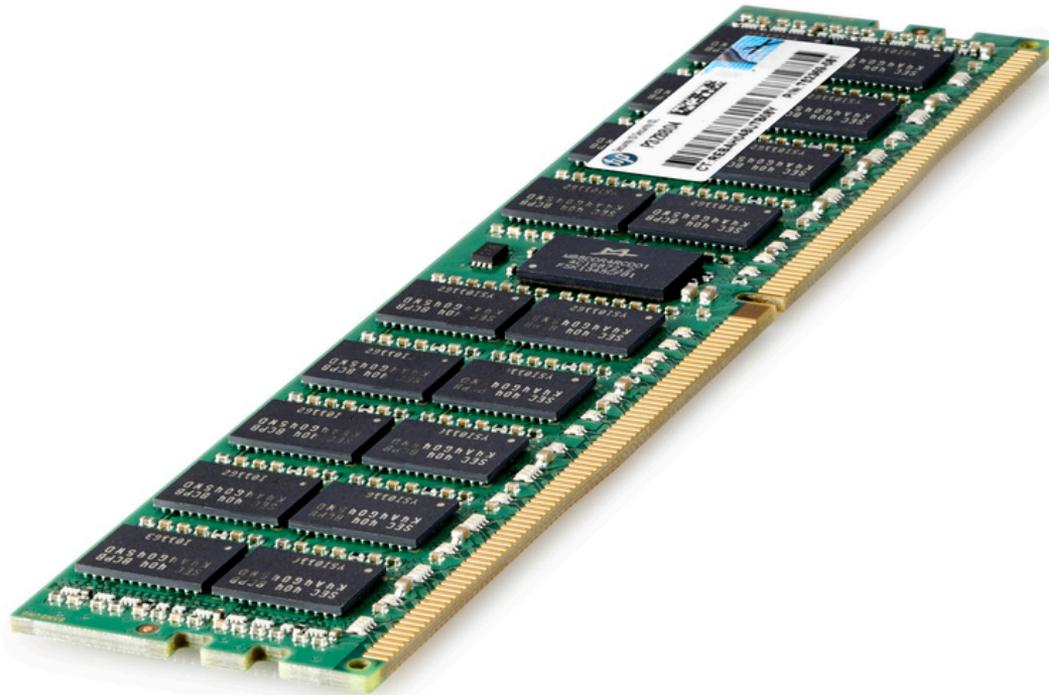
What's New

- HPE SmartMemory 128GB DDR4 2400 MT/s memory supported on HPE Gen9 Servers

Models

Models

DDR4 SmartMemory	**Registered Memory Kit**	
	HP 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726717-B21
	HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726718-B21
	HP 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
	HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726719-B21
	HP 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	728629-B21
	HPE 8GB (1x8GB) Single Rank x8 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805347-B21
	HPE 16GB (1x16GB) Single Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805349-B21
	HPE 16GB (1x16GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	836220-B21
	HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805351-B21
	Load-reduced DIMMs (LRDIMM)	
	HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load-reduced Memory Kit	726720-B21
	HP 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load-reduced Memory Kit	726722-B21
	HP 48GB (1x16GB +1x32GB) DDR4-2133 CAS-15-15-15 Load-reduced Memory FIO Kit	792278-B21
	HP 64GB (1x64GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load-reduced Memory Kit	726724-B21
	HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Load-reduced Memory Kit	805353-B21
	HPE 64GB (1x64GB) Quad Rank x4 DDR4-2400 CAS-17-17-17 Load-reduced Memory Kit	805358-B21
	HPE 128GB (1x128GB) Octal Rank x4 DDR4-2400 CAS-20-18-18 Load-reduced Memory Kit	809208-B21

NOTE: Memory DIMM availability with a server platform is dependent upon completion of certification testing.

Compatibility

DIMM Option Compatibility[1]

Registered Memory Kit

HPE P/N	Description	Where Used
726717-B21	HP 4GB 1Rx8 PC4-2133P-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/DL60 Gen9/DL80 Gen9/DL120 Gen9/DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9/DL388 Gen9(BTO)/ML110 Gen9/ML150 Gen9/ML350 Gen9
726718-B21	HP 8GB 1Rx4 PC4-2133P-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 6000/BL460c Gen9/BL660c Gen9/DL60 Gen9/DL80 Gen9/DL120 Gen9 DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/DL560/DL580/ML110 Gen9/ML150 Gen9 ML350 Gen9/WS460c Gen9
759934-B21	HP 8GB 2Rx8 PC4-2133P-R Kit	
726719-B21	HP 16GB 2Rx4 PC4-2133P-R Kit	
728629-B21	HP 32GB 2Rx4 PC4-2133P-R Kit	
805347-B21	HPE 8GB 1Rx8 PC4-2400T-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 8000/BL460c Gen9 DL60 Gen9/DL80 Gen9/DL120 Gen9/DL160 Gen9/DL180 Gen9 DL360 Gen9/DL380 Gen9/DL388 Gen9(BTO)/ML110 Gen9 ML150 Gen9/ML350 Gen9/Synergy 480 Gen9/WS460c Gen9
805349-B21	HPE 16GB 1Rx4 PC4-2400T-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 8000/BL460c Gen9 Cloud Management IT/DL60 Gen9/DL80 Gen9/DL120 Gen9 DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/ML110 Gen9/ML150 Gen9/ML350 Gen9 Synergy 480 Gen9/WS460c Gen9
836220-B21	HPE 16GB 2Rx4 PC4-2400T-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 8000/BL460c Gen9 DL60 Gen9/DL80 Gen9/DL120 Gen9/DL160 Gen9/DL180 Gen9 DL360 Gen9/DL380 Gen9/DL388 Gen9(BTO)/ML110 Gen9 ML150 Gen9/ML350 Gen9/Synergy 480 Gen9
805351-B21	HPE 32GB 2Rx4 PC4-2400T-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 8000/BL460c Gen9 Cloud Management IT/DL60 Gen9/DL80 Gen9/DL120 Gen9 DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/ML110 Gen9/ML150 Gen9/ML350 Gen9 Synergy 480 Gen9/WS460c Gen9

NOTE: Memory DIMM availability with a server platform is dependent upon completion of certification testing.

Compatibility

Load Reduced DIMMs (LRDIMM)[1]

HPE P/N	Description	Where Used
726720-B21	HP 16GB 2Rx4 PC4-2133P-L Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 6000/BL460c Gen9/BL660c Gen9/DL60 Gen9/DL80 Gen9/DL120 Gen9 DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/DL560/DL580/ML110 Gen9/ML150 Gen9 ML350 Gen9/WS460c Gen9
726722-B21	HP 32GB 4Rx4 PC4-2133P-L Kit	
792278-B21	HP 48GB (32+16)PC4-2133P-L Combo FIO Kit	BL460c Gen9/BL660c Gen9/WS460c Gen9
726724-B21	HP 64GB 4Rx4 PC4-2133P-L Kit	Apollo 4200/Apollo 4500/Apollo 6000/BL460c Gen9/BL660c Gen9/ DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/DL560/DL580 ML350 Gen9/WS460c Gen9
805353-B21	HPE 32GB 2Rx4 PC4-2400T-L Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 6000/BL460c Gen9 DL60 Gen9/DL80 Gen9/DL120 Gen9/DL160 Gen9/DL180 Gen9 DL360 Gen9/DL380 Gen9/DL388 Gen9(BTO) ML150 Gen9/ML350 Gen9/Synergy 480 Gen9/WS460c Gen9
805358-B21	HPE 64GB 4Rx4 PC4-2400T-L Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 6000/BL460c Gen9 DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/ML350 Gen9/Synergy 480/WS460c Gen9
809208-B21	HPE 128GB 8Rx4 PC4-2400T-L Kit	Apollo 2000/Apollo 6000/BL460c Gen9/DL360 Gen9/DL380 Gen9/ML350 Gen9/Synergy 480 Gen9/WS460c Gen9

NOTE: Memory DIMM availability with a server platform is dependent upon completion of certification testing.

Standard Features

What is HPE SmartMemory?

HPE SmartMemory is unique technology designed for HPE servers. It passes rigorous qualification tests and optimizes memory performance on the HPE Proliant Rack and Tower servers, Apollo family, Blade systems, and Synergy systems. Authenticated HPE SmartMemory supports extended memory performance in the competitive landscape and provides customers with service enhancement through HPE Active Health Systems and other HPE proprietary software.

Quality and Performance

HPE SmartMemory undergoes a rigorous qualification process to provide our customers with the highest server memory quality options. Its performance is tested and optimized for HPE servers, supporting unique features only available with HPE ProLiant Rack and Tower servers, Apollo family, Blade and Synergy systems. In addition, it enhances memory throughput up to 23% and achieves an improvement in latency of up to 25%.

HPE Active Health System

Future ROM updates will enable HPE SmartMemory to work in conjunction with the HPE Active Health System which monitors changes to the server hardware configuration to enable lifecycle monitoring of memory health status. Having insight into memory related service events will shorten problem diagnosis and deliver rapid resolutions if and when failures occur. Whereas the pre-failure alert simply notifies the administrator of an impending failure, HPE SmartMemory can provide insight with rich information on memory-related events like multi-bit errors or configuration issues.

Support Matrix

Please see the following URL for the latest list of supported servers:
http://h22195.www2.hp.com/DDR4memoryconfig/

Other Resources

For the latest updates on HPE Server Options, visit: **http://www.hp.com/go/hpqo**

For more information on the HPE Persistent Memory Options, visit:
http://www.hpe.com/servers/persistentmemory

Service and Support

HPE Support Center Personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more: **https://www.hpe.com/us/en/services/it-support.html**

The HPE Support Center Mobile App allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalize IT support anywhere, anytime.
NOTE: The HPE Support Center Mobile App is subject to local availability

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Parts and materials Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain operating condition for covered hardware products, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product QuickSpecs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

Warranty / Service Coverage For ProLiant servers and storage systems, this service covers HPE-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22 inches and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

For details on the HPE Server Options Limited Warranty visit:
http://h20566.www2.hpe.com/hpsc/wc/public/home

General Memory Population Rules and Guidelines:
- Install DIMMs only if the corresponding processor is installed.
- If only one processor is installed in a two-processor system, only half of the DIMM slots are available.
- To maximize performance, it is recommended to balance the total memory capacity between all installed processors and load the channels similarly whenever possible.
- When two processors are installed, balance the DIMMs across the two processors.
- White DIMM slots denote the first slot to be populated in a channel.
- Place the DIMMs with the highest number of ranks in the white slot when mixing DIMMs of different ranks on the same channel.
- Mixing of DIMM types (UDIMM, RDIMM, and LRDIMM) is not supported.
- Mixing the 128GB LRDIMM with other capacities is not supported.
- Quad rank LRDIMMs are capable of up to 3DPC.
- DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- The maximum memory capacity is a function of the memory type and number of installed processor.
- To enable Mirrored Memory mode, the system allocates half of the installed memory as system memory and the remaining half as mirrored memory. All memory channels must be configured identically.
- Only an RDIMM can be mixed with HPE NVDIMM

Service and Support

- When installing NVDIMM(s) on the same memory channel as RDIMM(s), populate the RDIMM(s) first and farthest from the processor, then populate the NVDIMM(s) last and closer to the processor.

Technical Specifications

Memory Speed by Processor Model

With Intel® Xeon® E5-2600 v3 Series Processor Family

DIMM Rank	Register DIMM (RDIMM)					Load Reduced (LRDIMM)		
	Single Rank (1R)	Single Rank (1R)	Dual Rank (2R)	Dual Rank (2R)	Dual Rank (2R)	Dual Rank (2R)	Quad Rank (4R)	Quad Rank (4R)
HPE SKU	726717-B21	726718-B21	759934-B21	726719-B21	726720-B21	728629-B21	726722-B21	726724-B21
DIMM Capacity	**4GB**	**8GB**	**8GB**	**16GB**	**32GB**	**16GB**	**32GB**	**64GB**
DRAM Depth [bit]	512MB	1G	512MB	1G	1G	2G	2G	2G
DRAM Width [bit]	X8	X4	X8	X4	X4	X4	X4	X4
DRAM Density	4Gb	4Gb	4Gb	4Gb	4Gb	8Gb	8Gb	8Gb
CAS Latency	15-15-15	15-15-15	15-15-15	15-15-15	15-15-15	15-15-15	15-15-15	15-15-15
DIMM Native Speed (MT/s)	2133	2133	2133	2133	2133	2133	2133	2133
Voltage	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V
MAXIMUM CAPACITY (GB)								
4 slot servers	16	32	32	64	128	NA	NA	NA
8 slot servers	32	64	64	128	256	NA	NA	NA
12 slot servers	48	96	96	192	384	192	384	NA
16 slot servers	64	128	128	256	512	256	512	1024
24 slot servers	96	192	192	384	768	384	768	1536
32 slot servers	128	256	256	512	1024	512	1024	2048
48 slot server	192	384	384	768	1536	768	1536	3072
96 slot server	NA	768	768	1536	3072	1536	3072	6144

Technical Specifications

With Intel® Xeon® E5-2600v4 Series Processor Family

DIMM Rank	Register DIMM (RDIMM)				Load Reduced (LRDIMM)		
	Single Rank (1R)	Single Rank (1R)	Dual Rank (2R)	Dual Rank (2R)	Dual Rank (2R)	Quad Rank (4R)	Octal Rank (8R)
HPE SKU	805347-B21	805349-B21	836220-B21	805351-B21	805353-B21	805358-B21	809208-B21
DIMM Capacity	**8GB**	**16GB**	**16GB**	**32GB**	**32GB**	**64GB**	**128GB**
DRAM depth [bit]	1G	2G	1G	2G	2G	2G	2G
DRAM Width [bit]	X8	X4	X4	X4	X4	X4	X4
DRAM Density	8Gb	8Gb	4Gb	8Gb	8Gb	8Gb	8Gb
CAS Latency	17-17-17	17-17-17	17-17-17	17-17-17	17-17-17	17-17-17	20-18-18
DIMM Native Speed (MT/s)	2400	2400	2400	2400	2400	2400	2400
Voltage	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V
MAXIMUM CAPACITY (GB)							
2 slot servers	NA	32	NA	64	NA	NA	NA
8 slot servers	64	128	128	256	NA	NA	NA
12 slot servers	96	192	192	384	384	NA	NA
16 slot servers	128	256	256	512	512	1024	2048
24 slot servers	192	384	384	768	768	1536	3072
32 slot servers	256	512	512	1024	1024	2048	4096
48 slot servers	384	768	768	1536	1536	3072	6144
96 slot servers	NA	1536	1536	3072	3072	6144	12288

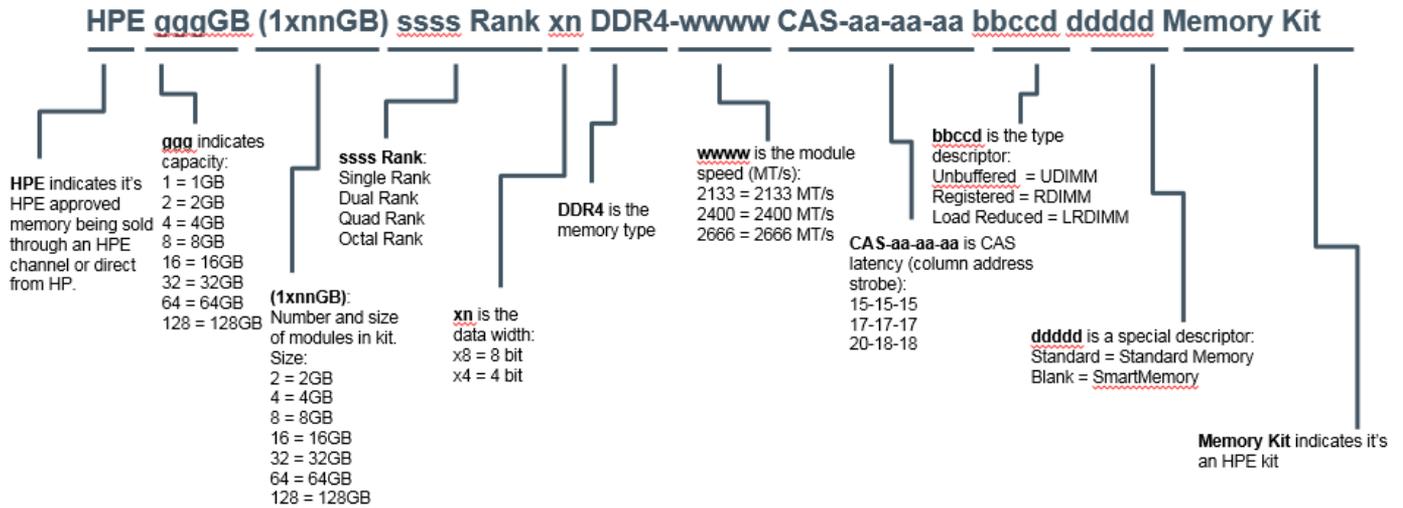## Memory options part number decoder

Short Name

Example: HPE 8GB 1Rx4 PC4-2133P-R Kit
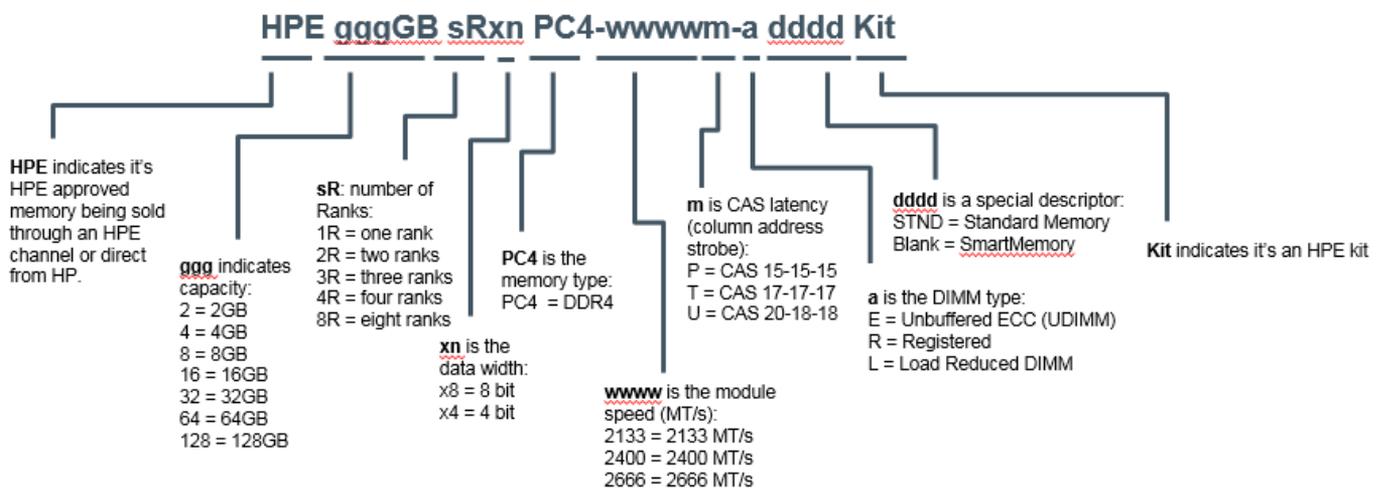
Long Name

Technical Specifications

Example: HPE 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit

HPE gggGB (1xnnGB) ssss Rank xn DDR4-wwww CAS-aa-aa-aa bbccd ddddd Memory Kit

HPE indicates it's HPE approved memory being sold through an HPE channel or direct from HP.

ggg indicates capacity:
1 = 1GB
2 = 2GB
4 = 4GB
8 = 8GB
16 = 16GB
32 = 32GB
64 = 64GB
128 = 128GB

(1xnnGB):
Number and size of modules in kit.
Size:
2 = 2GB
4 = 4GB
8 = 8GB
16 = 16GB
32 = 32GB
64 = 64GB
128 = 128GB

ssss Rank:
Single Rank
Dual Rank
Quad Rank
Octal Rank

xn is the data width:
x8 = 8 bit
x4 = 4 bit

DDR4 is the memory type

wwww is the module speed (MT/s):
2133 = 2133 MT/s
2400 = 2400 MT/s
2666 = 2666 MT/s

CAS-aa-aa-aa is CAS latency (column address strobe):
15-15-15
17-17-17
20-18-18

bbccd is the type descriptor:
Unbuffered = UDIMM
Registered = RDIMM
Load Reduced = LRDIMM

ddddd is a special descriptor:
Standard = Standard Memory
Blank = SmartMemory

Memory Kit indicates it's an HPE kit

Summary of Changes

Date	Version History	Action	Description of Change
06-Jun-2016	From Version 7 to 8	Changed	Overview, Models, Compatibility, Standard Features, Service and Support, and Technical Specifications sections were updated.
4-May-2016	From Version 6 to 7	Changed	Memory Speed Table, Ground rules updates, Tech Term edits
31-Mar-2016	From Version 5 to 6	Changed	Overview, Overview, Standard Features, Service and Support, and Technical Specifications
		Added	SKU Added in Models section: 805347-B21, 805349-B21, 836220-B21, 805351-B21, 805353-B21, 805358-B21, 726718-B21, 726719-B21, 728629-B21, 726722-B21, 809208-B21
01-Jun-2015	From Version 4 to 5	Added	SKU Added in Models section: 726724-B21
		Changed	What´s new, Technical Specifications & Models sections were updated.
30-Mar-2015	From Version 3 to 4	Changed	Overview, Service and Support and Technical Specifications sections were updated
		Added	SKU Added on Models: 728629-B21
16-Jan-2015	From Version 2 to 3	Changed	Performance section on Standard Features was updated
01-Dec-2014	From Version 1 to 2	Changed	Overview and Technical Specifications sections were updated
		Added	SKUs added to Models: 726717-B21, 759934-B21, 726720-B21, 792278-B21

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