

Dell EMC PowerEdge R640

Technical Specifications

Notes, cautions, and warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your product.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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Technical specifications

Topics:

- System dimensions
- Chassis weight
- Processor specifications
- Cooling fan specifications
- PSU specifications
- System battery specifications
- Expansion bus specifications
- Memory specifications
- Storage controller specifications
- Drives
- Ports and connectors specifications
- Environmental specifications

System dimensions

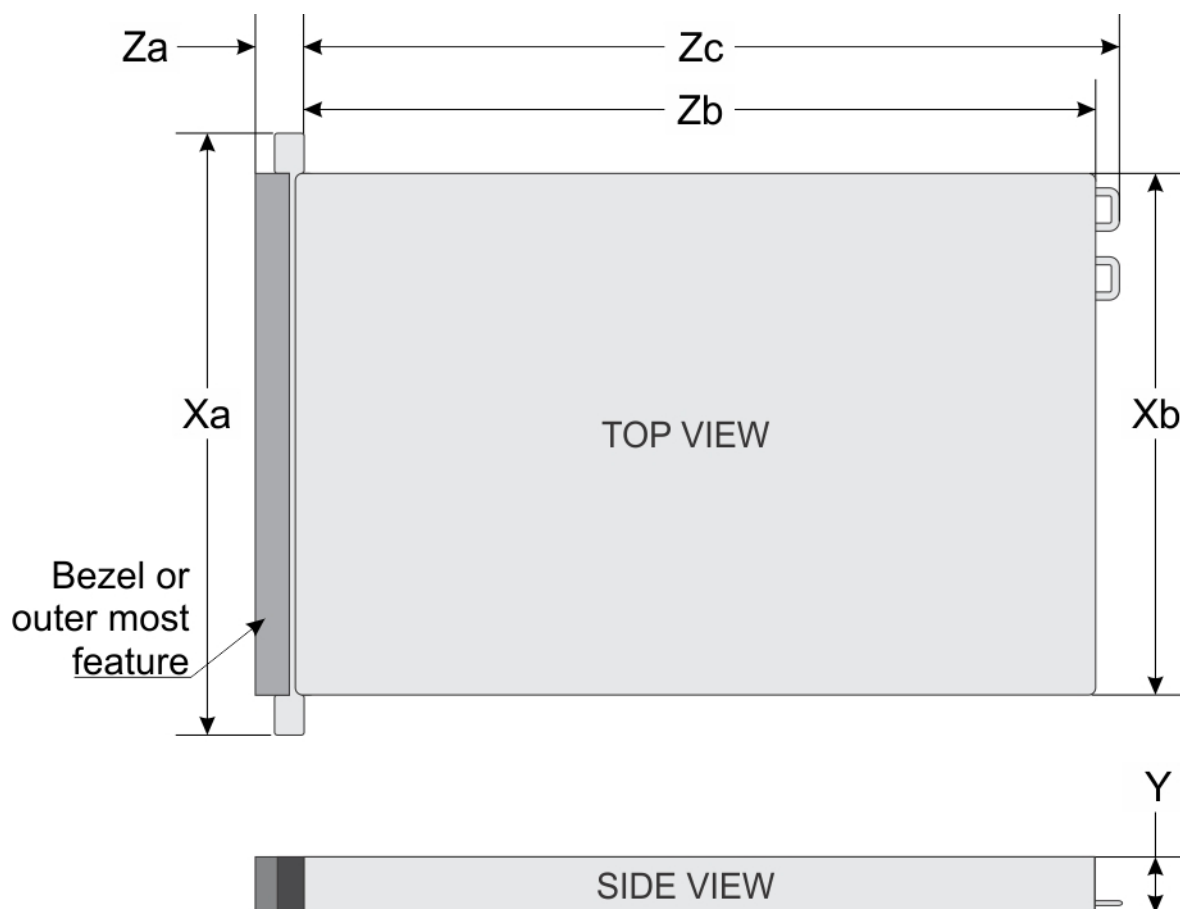


Figure 1. System dimensions

Table 1. Dimensions

System	Xa	Xb	Y	Za (with bezel)	Za (without bezel)	Zb*	Zc
4 x 3.5-inches or 10 x 2.5-inches	482.0 mm (18.97-inches)	434.0 mm (17.08-inches)	42.8 mm (1.68-inches)	35.84 mm (1.41-inches)	22.0 mm (0.87-inches)	733.82 mm (29.61-inches)	772.67 mm (30.42-inches)
8 x 2.5-inches	482.0 mm (18.97-inches)	434.0 mm (17.08-inches)	42.8 mm (1.68-inches)	35.84 mm (1.41-inches)	22.0 mm (0.87-inches)	683.05 mm (26.89-inches)	721.91 mm (28.42-inches)

Chassis weight

Table 2. Chassis weight

System	Maximum weight (with all hard drives/SSDs)
PowerEdge R640	21.9 kg (48.28 lbs)

Processor specifications

The PowerEdge R640 system supports two 2nd generation Intel Xeon Scalable processors, up to 28 cores per processor.

NOTE: The sockets for the processors are not hot-pluggable.

Cooling fan specifications

The cooling fans are integrated into the system to dissipate the heat generated by the functioning of the system. These fans provide cooling for the processors, expansion cards, and memory modules.

Your system supports up to eight standard or high performance cooling fans.

NOTE:

- High performance fans can be identified by a blue label on top of the cooling fan.
- Mixing of standard and high performance cooling fans is not supported.
- Each fan is listed in the systems management software, referenced by the respective fan number. If there is a problem with a particular fan, you can easily identify and replace the proper fan by noting the fan number on the system.

PSU specifications

The PowerEdge R640 system supports up to two AC or DC power supply units (PSUs).

Table 3. PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage
495 W AC	Platinum	1908 BTU/hr	50/60 Hz	100–240 V AC, autoranging
750 W AC	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging
750 W Mixed Mode AC	Platinum	2902 BTU/hr	50/60 Hz	100–240 V AC, 10 A - 5 A

Table 3. PSU specifications (continued)

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage
750 W AC	Titanium	2843 BTU/hr	50/60 Hz	200–240 V AC, autoranging
750 W Mixed Mode HVDC (for China only)		2891 BTU/hr	50/60 Hz	100–240 V AC and 240 V DC
750 W Mixed Mode DC (for China only)	Platinum	2902 BTU/hr	50/60 Hz	240 V DC, 4.5 A
1100 W DC	Gold	4416 BTU/hr	50/60 Hz	–(48–60) V DC
1100 W Mixed Mode HVDC (for China and Japan only)	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC and 200–380 V DC
1100 W AC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging
1600 W AC		6000 BTU/hr	50/60 Hz	100–240 V AC, autoranging

- NOTE:** If system with 1100 W AC or HVDC PSU operates from 100 to 120V, the power rating per PSU is derated to 1050 W.
- NOTE:** If system with 1600 W PSUs operates from 100 to 120 V, then the power rating per PSU is derated to 800 W.
- NOTE:** Heat dissipation is calculated using the PSU wattage rating.
- NOTE:** This system is also designed to connect to the IT power systems with a phase to phase voltage not exceeding 230 V.
- NOTE:** PSUs rated for 1600 W and higher require high-line voltage (200-240 V) to supply their rated capacity.

System battery specifications

The PowerEdge R640 system supports CR 2032 lithium coin cell system battery.

Expansion bus specifications

The PowerEdge R640 system supports PCI express (PCIe) generation 3 expansion cards, which are installed on the system, using expansion card risers. This system supports 1A, 2A, 1B, and 2B expansion card risers.

- NOTE:**
 - The expansion card riser slots are not hot-pluggable.
 - Internal cable connectors are not hot-pluggable.

Memory specifications

Table 4. Memory specifications

DIMM type	DIMM rank	DIMM capacity	Single processor		Dual processors	
			Minimum RAM	Maximum RAM	Minimum RAM	Maximum RAM
LRDIMM	Octa rank	512 GB	512 GB	6 TB	1024 GB	12 TB
		256 GB	256 GB	3 TB	512 GB	6 TB

Table 4. Memory specifications (continued)

DIMM type	DIMM rank	DIMM capacity	Single processor		Dual processors	
			Minimum RAM	Maximum RAM	Minimum RAM	Maximum RAM
		128 GB	128 GB	1.5 TB	256 GB	3 TB
	Quad rank	64 GB	64 GB	768 GB	128 GB	1.5 TB
RDIMM	Single rank	8 GB	8 GB	96 GB	16 GB	192 GB
	Dual rank	16 GB	16 GB	192 GB	32 GB	384 GB
		32 GB	32 GB	384 GB	64 GB	768 GB
		64 GB	64 GB	768 GB	128 GB	1536 GB
NVDIMM-N	Single rank	16 GB	Not supported with single processor	Not supported with single processor	RDIMM: 192 GB NVDIMM-N: 16 GB	RDIMM: 384 GB NVDIMM-N: 192 GB
PMem	NA	128 GB	RDIMM: 64 GB	RDIMM: 384 GB	RDIMM: 128 GB	LRDIMM: 1536 GB
			PMem: 128 GB	PMem: 768 GB	PMem: 128 GB	PMem: 1536 GB
	NA	256 GB	NA	NA	RDIMM: 192 GB	LRDIMM: 1536 GB
			NA	NA	PMem: 2048 GB	PMem: 3072 GB
	NA	512 GB	NA	NA	RDIMM: 384 GB	RDIMM: 1536 GB
			NA	NA	PMem: 4096 GB	PMem: 6144 GB

- NOTE:** 8 GB RDIMMs and NVDIMM-N must not be mixed.
- NOTE:** Minimum of two CPUs are required for any configurations that support NVDIMM-N.
- NOTE:** PMem can be mixed with RDIMMs and LRDIMMs.
- NOTE:** Mixing of DDR4 DIMM Types (RDIMM, LRDIMM), within channel, integrated memory controller, socket, or across sockets is not supported.
- NOTE:** x4 and x8 DDR4 DIMMs can be mixed within channel.
- NOTE:** Mix of Intel PMem operating modes (App Direct, Memory Mode) is not supported within socket or across sockets.
- NOTE:** DIMM slots are not hot-pluggable.

Storage controller specifications

The PowerEdge R640 system supports:

- **Internal storage controller cards:** PowerEdge RAID Controller (PERC) H330, H350, HBA350i, H730P, H740P, H750 (adapter only), Software RAID (SWRAID) S140.
- **Boot Optimized Storage Subsystem:** HWRAID 2 x M.2 SSDs 240 GB, 480 GB.
 - The card supports up to two 6 Gbps M.2 SATA drives. The BOSS adapter card has a x8 connector using PCIe gen 2.0 x2 lanes, available only in the low-profile and half-height form factor.
- **External PERC (RAID):** H840
- **12Gbps SAS HBAs (non-RAID):**
 - External- 12 Gbps SAS HBA (non-RAID), HBA355e (adapter only, non-RAID)
 - Internal- HBA330 (non-RAID), HBA350i (non-RAID)

- NOTE:** The mini-PERC socket is not hot-pluggable.

NOTE: The PERC H750, H350 and HBA350i cards are not supported on 4x3.5 + 2x2.5 dual PERC, 10x2.5 + 2x2.5 dual PERC, or x10 NVMe configurations.

Drives

Hard drive specifications

The PowerEdge R640 supports :

- Up to ten 2.5 inch, hot swappable SAS, SATA, SAS/SATA SSD, NVMe (up to 8x) or Nearline SAS hard drives with up to 2 x 2.5 inch hot swappable SAS, SATA, SAS/SATA SSD, NVMe or Nearline SAS hard drives supported at the back of the system
- Up to eight 2.5 inch, hot swappable SAS, SATA, SAS/SATA SSD, or Nearline SAS hard drives
- Up to four 3.5 inch, hot swappable hard drives with up to 2 x 2.5 inch hot swappable SAS, SATA, SAS/SATA SSD, or Nearline SAS hard drives supported at the back of the system

Optical drive

Certain configurations of the system support one optional SATA DVD-ROM drive or DVD+/-RW drive.

NOTE: The optical drive is supported in both 4 x 3.5 and 8 x 2.5 inch hard drive systems.

Ports and connectors specifications

USB ports

Table 5. USB port specifications

System	Front panel	Back panel	Internal
Four hard drive systems	One 4-pin, USB 2.0-compliant ports	Two 9-pin, USB 3.0-compliant ports	One 9-pin, USB 3.0-compliant ports
	One 5-pin micro USB 2.0 management port NOTE: The micro USB 2.0-compliant port on the front panel can only be used as an iDRAC Direct or a management port.	N/A	N/A
Eight hard drive systems	One 4-pin, USB 2.0-compliant ports	Two 9-pin, USB 3.0-compliant ports NOTE: One optional USB 3.0-compliant port on the front panel for 4 x 3.5 and 8 x 2.5 inch hard drive systems.	One 9-pin, USB 3.0-compliant ports
	One 5-pin micro USB 2.0 management port	N/A	N/A
Ten hard drive systems	One 4-pins, USB 2.0-compliant port	Two 9-pin, USB 3.0-compliant ports	One 9-pin, USB 3.0-compliant ports
	One 5-pin micro USB 2.0 management port	N/A	N/A

NIC ports

The PowerEdge R640 system supports four Network Interface Controller (NIC) ports on the back panel, which are available in the following configurations:

- Four RJ-45 ports that support 10, 100 and 1000 Mbps
- Four RJ-45 ports that support 100 M, 1 G and 10 Gbps
- Four RJ-45 ports, where two ports support maximum of 10 G and the other two ports maximum of 1 Gbps
- Two RJ-45 ports that support up to 1 Gbps and 2 SFP+ ports that support up to 10 Gbps
- Four SFP+ ports that support up to 10 Gbps
- Two SFP28 ports that support up to 25 Gbps

NOTE: You can install up to three PCIe add-on NIC cards.

NOTE: The NDC slot is not hot-pluggable.

Serial port

The PowerEdge R640 system supports one serial port on the back panel. This port is a 9-pin connector, Data Terminal Equipment (DTE), 16550-compliant.

NOTE: The Serial port is not hot-pluggable.

VGA ports

The Video Graphic Array (VGA) port enables you to connect the system to a VGA display. The PowerEdge R640 system supports one 15-pin VGA port on the front and back of system.

NOTE: The VGA ports are not hot-pluggable.

Video specifications

The PowerEdge R640 system supports integrated Matrox G200eW3 graphics controller with 16 MB of video frame buffer .

Table 6. Supported video resolution options

Resolution	Refresh rate (Hz)	Color depth (bits)
640 x 480	60, 70	8, 16, 32
800 x 600	60, 75, 85	8, 16, 32
1024 x 768	60, 75, 85	8, 16, 32
1152 x 864	60, 75, 85	8, 16, 32
1280 x 1024	60, 75	8, 16, 32
1440 x 900	60	8, 16, 32
1920 x 1200	60	8, 16, 32

IDSDM or vFlash card

The PowerEdge R640 system supports Internal Dual SD module (IDSDM) and vFlash card. In the 14th generation of PowerEdge servers, IDSDM and vFlash card are combined into a single module, and are available in the following options:

- vFlash or
- vFlash and IDSDM

The IDSDM/vFlash card can be connected in a Dell-proprietary PCIe x1 slot using a USB 3.0 interface to host. IDSDM/vFlash module supports two MicroSD cards for IDSDM and one card for vFlash. The MicroSD card capacity for IDSDM are 16, 32, or 64

GB, while for vFlash the MicroSD card capacity is 16 GB. The IDSDM or vFlash module combines the IDSDM or vFlash features into a single module.

NOTE: There are two dip switches on the IDSDM/vFlash card for write-protection.

NOTE: One IDSDM card slot is dedicated for redundancy.

NOTE: It is recommended to use Dell branded MicroSD cards associated with the IDSDM/vFlash configured systems.

NOTE: The IDSDM and vFlash slot is not hot-pluggable.

Environmental specifications

NOTE: For additional information about environmental certifications, please refer to the Product Environmental Datasheet located with the Manuals & Documents on www.dell.com/poweredge/manuals

Table 7. Temperature specifications

Temperature	Specifications
Storage	-40°C to 65°C (-40°F to 149°F)
Continuous operation (for altitude less than 950 m or 3117 ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment. NOTE: Maximum of 205 W, 28 core processor is supported in systems with eight 2.5 inch processor direct attached PCIe SSD drives, and three PCIe slot chassis. NOTE: Certain configurations may have ambient temperature restrictions. For more information see the Ambient temperature limitations section.
Fresh air	For information about fresh air, see Expanded Operating Temperature section.
Maximum temperature gradient (operating and storage)	20°C/h (68°F/h)

Table 8. Relative humidity specifications

Relative humidity	Specifications
Storage	5% to 95% RH with 33°C (91°F) maximum dew point. Atmosphere must be non-condensing at all times.
Operating	10% to 80% relative humidity with 29°C (84.2°F) maximum dew point.

Table 9. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.26 G _{rms} at 5 Hz to 350 Hz (all operation orientations).
Storage	1.88 G _{rms} at 10 Hz to 500 Hz for 15 min (all six sides tested).

Table 10. Maximum shock specifications

Maximum shock	Specifications
Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axes of 6 G for up to 11 ms.

Table 10. Maximum shock specifications (continued)

Maximum shock	Specifications
Storage	Six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) of 71 G for up to 2 ms.

Table 11. Maximum altitude specifications

Maximum altitude	Specifications
Operating	3048 m (10,000 ft)
Storage	12,000 m (39,370 ft)

Table 12. Operating temperature de-rating specifications

Operating temperature de-rating	Specifications
Up to 35°C (95°F)	Maximum temperature is reduced by 1°C/300 m (1°F/547 ft) above 950 m (3,117 ft).
35°C to 40°C (95°F to 104°F)	Maximum temperature is reduced by 1°C/175 m (1°F/319 ft) above 950 m (3,117 ft).
40°C to 45°C (104°F to 113°F)	Maximum temperature is reduced by 1°C/125 m (1°F/228 ft) above 950 m (3,117 ft).

Standard operating temperature

Table 13. Standard operating temperature specifications

Standard operating temperature	Specifications
Continuous operation (for altitude less than 950 m or 3117 ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment.

Expanded operating temperature

Table 14. Expanded operating temperature specifications

Expanded operating temperature	Specifications
Continuous operation	<p>5°C–40°C at 5% to 85% RH with 29°C dew point.</p> <p>i NOTE: Outside the standard operating temperature (10°C–35°C), the system can operate continuously in temperatures as low as 5°C and as high as 40°C.</p> <p>For temperatures between 35°C–40°C, de-rate maximum allowable temperature by 1°C per 175 m above 950 m (1°F per 319 ft).</p>
≤ 1% of annual operating hours	<p>–5°C–45°C at 5% to 90% RH with 29°C dew point.</p> <p>i NOTE: Outside the standard operating temperature (10°C–35°C), the system can operate down to –5°C or up to 45°C for a maximum of 1% of its annual operating hours.</p> <p>For temperatures between 40°C and 45°C, de-rate maximum allowable temperature by 1°C per 125 m above 950 m (1°F per 228 ft).</p>

i **NOTE:** When operating in the expanded temperature range, system performance may be impacted.

NOTE: When operating in the expanded temperature range, ambient temperature warnings may be reported on the LCD panel and in the System Event Log.

Expanded operating temperature restrictions

- Do not perform a cold startup below 5°C.
- The operating temperature specified is for a maximum altitude of 3050 m (10,000 ft).
- 150 W/8 C, 165 W/12 C and higher wattage processor(TDP>165 W) are not supported.
- Redundant power supply unit is required.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- NVDIMM-Ns are not supported.
- PMems are not supported.
- GPU is not supported.
- PCIe SSD is not supported.
- Rear installed drives are not supported
- Tape backup unit is not supported.

Thermal restrictions

The following table lists the configurations required for efficient cooling.

Table 15. Thermal restrictions configuration

Configuration	Number of processors	Heatsink	Processor/DIMM blank	DIMM blanks	Maximum number of DIMM blanks	Fan
PowerEdge R640 (2.5 inch hard drives x 10)	1	One 1U standard heat sink for CPU ≤ 165 W	Not required	Required for processor 1	11 blanks	Five standard fans
		One 1U 2-pipe heat sink for CPU=200/205 W and 150 W/165 W FO*	Required			Eight high performance fans
	2	Two 1U standard heat sink for CPU ≤ 165 W	Not required	Required	22 blanks	Eight standard fans
		Two 1U 2-pipe heat sink for CPU=200/205 W and 150 W/165 W FO*				Eight high performance fans
PowerEdge R640 (2.5 inch hard drives x 10 with NVMe drives)	2	Two 1U standard heat sink for CPU ≤ 165 W	Not required	Required	22 blanks	Eight high performance fans
		Two 1U 2-pipe heat sink for CPU=200/205 W and 150 W/165 W FO*				
PowerEdge R640 (2.5 inch hard drives x 8)	1	One 1U standard heat sink for CPU ≤ 165 W	Not required	Required for processor 1	11 blanks	Five standard fans
		One 1U 2-pipe heat sink for CPU=150 W/165 W FO*	Required			

Table 15. Thermal restrictions configuration (continued)

Configuration	Number of processors	Heatsink	Processor/ DIMM blank	DIMM blanks	Maximum number of DIMM blanks	Fan
(3.5 inch hard drives x 4)	2	One 1U 2-pipe heat sink for CPU=200/205 W				Eight high performance fans
		Two 1U standard heat sink for CPU ≤ 165 W	Required			Eight standard fans
		Two 1U 2-pipe heat sink for CPU=150 W/165 W FO*	Not required			Eight high performance fans
		Two 1U 2-pipe heat sink for CPU=200/205 W	Not required	Required	22 blanks	
PowerEdge R640 (3.5 inch hard drives x 4 with NVMe drives x 2 in the rear)	2	Two 1U standard heat sink for CPU ≤ 165 W	Not required	Required	22 blanks	Eight standard fans
		Two 1U 2-pipe heat sink for CPU=155 W/165 W FO*				
		Two 1U 2-pipe heat sink for CPU=200/205W				

NOTE: *165 W and 150 W FO includes Intel Xeon Gold 6146, 6144, 6244 and 6246 processors.

Table 16. PMem thermal restrictions configuration

Configuration	TDP	Maximum ambient temperature	Fan requirement	Heatsink Requirement
PowerEdge R640 2.5 inch x10 hard drives (PCIe x3) 3.5 inch x4 hard drives (PCIe x2/x3) 2.5 inch x8 hard drives (PCIe x3/x2)	200/205 W 155/165 W FO* 165 W Gold 6146 150 W 6144 and 6244 150 W Gold 6240Y	30°C	High performance fans	High performance heat sink
		35°C		
		35°C		
		35°C		
PowerEdge R640 2.5 inch x10 hard drives (PCIe x3) 3.5 inch x4 hard drives (PCIe x2/x3) 2.5 inch x8 hard drives (PCIe x3/x2)	70 to 165 W	35°C	High performance fans	High performance heat sink

NOTE: When installing PMems for systems that support 200W or higher wattage processors, the ambient temperature of 30°C must be adhered to ensure proper cooling and to avoid excess processor throttling, which may impact system performance.

Table 17. GPU thermal restrictions configuration

TDP(Watts)	PowerEdge R640 2.5 inch hard drives x 10 x2GPU in slot 1,3		PowerEdge R640 (2.5 inch hard drives x 8 x3GPU)	
	Thermal restriction at 30°C	Thermal restriction at 35°C	Thermal restriction at 30°C	Thermal restriction at 35°C
200/205 W 155/165 W FO* 165 W Gold 6146 150 W 6144 and 6244 150 W Gold 6240Y	High performance fans and High performance heat sink required	Not supported	High performance fans and High performance heat sink required	Not supported
70 to 165 W	Standard fans and standard heat sink required	Not supported	Standard fans and standard heat sink required	Not supported

NOTE: PowerEdge R640 does not support x3 GPU T4 (PPGXG) in 2.5 inch x10 hard drive chassis.

Ambient temperature limitations

The following table lists configurations that require ambient temperature less than 35°C.

NOTE: The ambient temperature limit must be adhered to ensure proper cooling and to avoid excess processor throttling, which may impact system performance.

Table 18. Configuration based ambient temperature restrictions

System	Front Backplane	Processor Thermal Design Power	Processor Heat Sink	Fan Type	Ambient Restriction
PowerEdge R640	10 x 2.5 inch SAS/SATA hard drives 8 x 2.5 inch SAS/SATA hard drives 4 x 3.5 inch SAS/SATA hard drives	200 W, 205 W	2 pipe 1U high performance	High performance fan	30°C
	10 x 2.5 inch SAS/SATA and NVMe drives(4, 8, or 10)	165 W 200 W, 205 W	2 pipe 1U standard 2 pipe 1U high performance	High performance fan	30°C

Particulate and gaseous contamination specifications

The following table defines the limitations that help avoid any equipment damage or failure from particulate and gaseous contamination. If the levels of particulate or gaseous pollution exceed the specified limitations and result in equipment damage or failure, you may need to rectify the environmental conditions. Remediation of environmental conditions is the responsibility of the customer.

Table 19. Particulate contamination specifications

Particulate contamination	Specifications
Air filtration	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit.

Table 19. Particulate contamination specifications (continued)

Particulate contamination	Specifications
	<p>i NOTE: This condition applies to data center environments only. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor.</p> <p>i NOTE: Air entering the data center must have the MERV11 or MERV13 filtration.</p>
Conductive dust	<p>Air must be free of conductive dust, zinc whiskers, or other conductive particles.</p> <p>i NOTE: This condition applies to data center and non-data center environments.</p>
Corrosive dust	<ul style="list-style-type: none"> • Air must be free of corrosive dust. • Residual dust present in the air must have a deliquescent point less than 60% relative humidity. <p>i NOTE: This condition applies to data center and non-data center environments.</p>

Table 20. Gaseous contamination specifications

Gaseous contamination	Specifications
Copper coupon corrosion rate	<300 Å/month per Class G1 as defined by ANSI/ISA71.04-1985.
Silver coupon corrosion rate	<200 Å/month as defined by AHSRAE TC9.9.

i **NOTE:** Maximum corrosive contaminant levels measured at ≤50% relative humidity.