

Power Systems

*PCIe adapter placement for the  
5148-21L, 5148-22L, 8247-21L,  
8247-22L, 8284-21A, or 8284-22A*

**IBM**



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5148-21L, 5148-22L, 8247-21L,  
8247-22L, 8284-21A, or 8284-22A*

**IBM**

**Note**

Before using this information and the product it supports, read the information in “Safety notices” on page v, “Notices” on page 31, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125-5823.

This edition applies to IBM Power Systems™ servers that contain the POWER8 processor and to all associated models.

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## Safety notices

Safety notices may be printed throughout this guide:

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

### World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, safety information documentation is included in the publications package (such as in printed documentation, on DVD, or as part of the product) shipped with the product. The documentation contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information documentation. You should also refer to the safety information documentation any time you do not clearly understand any safety information in the U.S. English publications.

Replacement or additional copies of safety information documentation can be obtained by calling the IBM Hotline at 1-800-300-8751.

### German safety information

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

### Laser safety information

IBM® servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

#### Laser compliance

IBM servers may be installed inside or outside of an IT equipment rack.

**DANGER:** When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.

- For racks with AC power, connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

**DANGER:**

- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. Remove all cables from the devices.

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

**(R001 part 1 of 2):**

**DANGER:** Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack mounted devices and do not use them to stabilize your body position (for example, when working from a ladder).





- Each rack cabinet might have more than one power cord.
  - For AC powered racks, be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
  - For racks with a DC power distribution panel (PDP), turn off the circuit breaker that controls the power to the system unit(s), or disconnect the customer's DC power source, when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

**(R001 part 2 of 2):**

**CAUTION:**

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.



- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

**CAUTION:**

Removing components from the upper positions in the rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building.

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
  - Remove all devices in the 32U position (compliance ID RACK-001 or 22U (compliance ID RR001) and above.
  - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.
  - Ensure that there are little-to-no empty U-levels between devices installed in the rack cabinet below the 32U (compliance ID RACK-001 or 22U (compliance ID RR001) level, unless the received configuration specifically allowed it.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- If the rack cabinet you are relocating was supplied with removable outriggers they must be reinstalled before the cabinet is relocated.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
  - Lower the four leveling pads.
  - Install stabilizer brackets on the rack cabinet.
  - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.
- If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.

(R002)

(L001)



**DANGER:** Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)

(L002)



**DANGER:** Rack-mounted devices are not to be used as shelves or work spaces. (L002)

(L003)



or



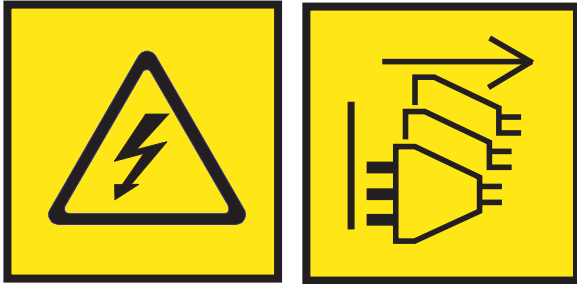
or



or



or



**DANGER:** Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

(L007)



**CAUTION:** A hot surface nearby. (L007)

(L008)



**CAUTION:** Hazardous moving parts nearby. (L008)

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

**CAUTION:**

**This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:**

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

(C026)

**CAUTION:**

Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. Although shining light into one end and looking into the other end of a disconnected optical fiber to verify the continuity of optic fibers many not injure the eye, this procedure is potentially dangerous. Therefore, verifying the continuity of optical fibers by shining light into one end and looking at the other end is not recommended. To verify continuity of a fiber optic cable, use an optical light source and power meter. (C027)

**CAUTION:**

**This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)**

**CAUTION:**

**Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)**

**CAUTION:**

**The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.**

*Do Not:*

- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

**Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C003)**

## CAUTION:

Regarding IBM provided VENDOR LIFT TOOL:

- Operation of LIFT TOOL by authorized personnel only.
- LIFT TOOL intended for use to assist, lift, install, remove units (load) up into rack elevations. It is not to be used loaded transporting over major ramps nor as a replacement for such designated tools like pallet jacks, walkies, fork trucks and such related relocation practices. When this is not practicable, specially trained persons or services must be used (for instance, riggers or movers).
- Read and completely understand the contents of LIFT TOOL operator's manual before using. Failure to read, understand, obey safety rules, and follow instructions may result in property damage and/or personal injury. If there are questions, contact the vendor's service and support. Local paper manual must remain with machine in provided storage sleeve area. Latest revision manual available on vendor's web site.
- Test verify stabilizer brake function before each use. Do not over-force moving or rolling the LIFT TOOL with stabilizer brake engaged.
- Do not move LIFT TOOL while platform is raised, except for minor positioning.
- Do not exceed rated load capacity. See LOAD CAPACITY CHART regarding maximum loads at center versus edge of extended platform.
- Only raise load if properly centered on platform. Do not place more than 200 lb (91 kg) on edge of sliding platform shelf also considering the load's center of mass/gravity (CoG).
- Do not corner load the platform tilt riser accessory option. Secure platform riser tilt option to main shelf in all four (4x) locations with provided hardware only, prior to use. Load objects are designed to slide on/off smooth platforms without appreciable force, so take care not to push or lean. Keep riser tilt option flat at all times except for final minor adjustment when needed.
- Do not stand under overhanging load.
- Do not use on uneven surface, incline or decline (major ramps).
- Do not stack loads.
- Do not operate while under the influence of drugs or alcohol.
- Do not support ladder against LIFT TOOL.
- Tipping hazard. Do not push or lean against load with raised platform.
- Do not use as a personnel lifting platform or step. No riders.
- Do not stand on any part of lift. Not a step.
- Do not climb on mast.
- Do not operate a damaged or malfunctioning LIFT TOOL machine.
- Crush and pinch point hazard below platform. Only lower load in areas clear of personnel and obstructions. Keep hands and feet clear during operation.
- No Forks. Never lift or move bare LIFT TOOL MACHINE with pallet truck, jack or fork lift.
- Mast extends higher than platform. Be aware of ceiling height, cable trays, sprinklers, lights, and other overhead objects.
- Do not leave LIFT TOOL machine unattended with an elevated load.
- Watch and keep hands, fingers, and clothing clear when equipment is in motion.
- Turn Winch with hand power only. If winch handle cannot be cranked easily with one hand, it is probably over-loaded. Do not continue to turn winch past top or bottom of platform travel. Excessive unwinding will detach handle and damage cable. Always hold handle when lowering, unwinding. Always assure self that winch is holding load before releasing winch handle.
- A winch accident could cause serious injury. Not for moving humans. Make certain clicking sound is heard as the equipment is being raised. Be sure winch is locked in position before releasing handle. Read instruction page before operating this winch. Never allow winch to unwind freely. Freewheeling will cause uneven cable wrapping around winch drum, damage cable, and may cause serious injury. (C048)

## Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE

The following comments apply to the IBM servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metalically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metalically to OSP wiring.

**Note:** All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

The dc-powered system is intended to be installed in a common bonding network (CBN) as described in GR-1089-CORE.





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## PCIe adapter placement for the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A

Find information about the Peripheral Component Interconnect (PCI) Express (PCIe) adapters that are supported for the IBM Elastic Storage Server Management Server (5148-21L), IBM Elastic Storage Server Data Server (5148-22L), IBM Power® System S812L (8247-21L), IBM Power System S822L (8247-22L), IBM Power System S812 (8284-21A), and the IBM Power System S822 (8284-22A) servers that contain the POWER8® processor.

The following features are electromagnetic compatibility (EMC) Class B features. See the Class B Notices in the Hardware Notices section.

*Table 1. Electromagnetic compatibility (EMC) Class B features*

Feature	Description
4807	PCIe Cryptographic Coprocessor
5269	POWER® GXT145 PCI Express Graphics Accelerator
5271	4-port 10/100/1000 Base-TX PCI Express Adapter
5274	2-port Gb Ethernet-SX PCI Express Adapter
5275	10 Gb Ethernet-SR PCI Express Adapter
5277	4-port Async EIA-232 PCIe 1X LP Adapter
5281	1 Gb Ethernet UTP 2-port PCIe Adapter
5769	10 Gb Ethernet-SR PCI Express Adapter
5772	10 Gb Ethernet-LR PCI Express Adapter
EC2G and EL39	PCIe LP 2-Port 10 GbE SFN6122F Adapter
EC2J	PCIe 2-Port 10 GbE SFN6122F Adapter
EC41	PCIe2 LP 3D Graphics Adapter x1
EL3Z	PCIe2 LP 2-port 10 GbE BaseT RJ45 Adapter
EN0X	PCIe2 LP 2-port 10 GbE BaseT RJ45 Adapter

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## PCIe adapter placement rules and slot priorities for the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A

Find information about the placement rules and slot priorities for the Peripheral Component Interconnect (PCI) Express (PCIe) adapters that are supported for the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system.

## PCIe slot descriptions for the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A

The 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system provides PCIe generation 3 slots. Table 2 on page 2 provides information about the PCIe slots in the 8247-21L system that has a single POWER8 processor module, the 8247-22L system that has two POWER8 processor modules, and the 8284-22A that offers both a single POWER8 processor module or two POWER8 processor modules. The PCIe slots are enabled to support the PCIe3 cable adapter (FC EJ05) that is used to attach the EMX0 PCIe Gen3 I/O expansion drawer.

Table 2. PCIe generation 3 slots in the system

Slot	Adapter size	Slot availability in				
		8247-21L and 5148-21L	8247-22L and 5148-22L	8284-21A 1 processor	8284-22A 1 processor	8284-22A 2 processors
PCIe3, x16	Low-profile	2 slots (P1-C6 and P1-C7)	4 slots (P1-C3 <sup>®</sup> , P1-C5, P1-C6, and P1-C7)	2 slots (P1-C6 and P1-C7)	2 slots (P1-C6 and P1-C7)	4 slots (P1-C3, P1-C5, P1-C6, and P1-C7)
PCIe3, x8	Low-profile	3 slots (P1-C9 <sup>1</sup> , P1-C11, and P1-C12)	4 slots (P1-C2, P1-C9 <sup>1</sup> , P1-C11, and P1-C12)	4 slots (P1-C9 <sup>1</sup> , P1-C10, P1-C11, and P1-C12)	3 slots (P1-C9 <sup>1</sup> , P1-C11, and P1-C12)	4 slots (P1-C2, P1-C9 <sup>1</sup> , P1-C11, and P1-C12)

<sup>1</sup>The slot is not available to install other adapters in the expanded function system backplane.

Two PCIe generation 3 (PCIe3) switches in the system backplane provide PCIe3 busses from the system processor modules that provide connectivity to the following features:

- PCIe slots
- Embedded PCIe local area network (LAN) controller
- PCIe3 internal SAS controller
- PCIe3 USB controller

The two PCIe3 switches follow:

- PCIe3 Switch 1 that provides PCIe buses from Processor Module 1, Chip-0.
- PCIe3 Switch 2 that provides PCIe buses from Processor Module 1, Chip-1.

Table 3 lists the features provided by the PCIe3 switches.

Table 3. PCIe generation 3 switches in the system.

Features provided	PCIe3 Switch 1	PCIe3 Switch 2
Lanes and ports	32-lane, 8-ports PCIe Gen3	48-lane, 12-ports PCIe Gen3
	With integrated 8.0 gigatransfers per second (GTps) Serializer/Deserializer (SerDes) speed negotiation, for each port	
Lane and polarity reversal	Supported	Supported
All ports support concurrent maintenance through I2C bus	Yes	Yes
End-to-end cyclic redundancy check (CRC) and Poison bit error checking	Supported	Supported
Data path parity	Supported	Supported
Memory error correction	Supported	Supported
Advanced error reporting	Supported	Supported
Aggregate full duplex bandwidth	512 GT/s	768 GT/s
Designate any port as the Upstream port	Yes	Yes
27x27 mm, 676-pin FCBGA package	Yes	Yes
Power consumption	<ul style="list-style-type: none"> <li>• Nominal: 6 watts</li> <li>• Maximum: 12 watts</li> </ul>	<ul style="list-style-type: none"> <li>• Nominal: 8 watts</li> <li>• Maximum: 12 watts</li> </ul>

Figure 1 shows the rear view of the system with the location codes for the PCIe adapter slots.

Table 4 lists the PCIe adapter slot locations and details for the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system.

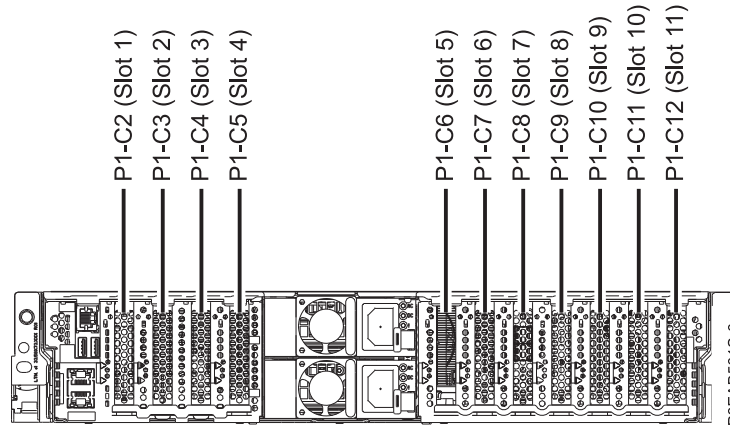


Figure 1. Rear view of a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system with PCIe slots location codes

Table 4. PCIe slot locations and descriptions for the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system

Slot	Location code	Description	PHB	Adapter size	Slot capabilities				Slot availability in	
					CAPI	SR-IOV	Dynamic direct memory access (DMA) window	I/O adapter enlarged capacity assign order <sup>5</sup>	8247-21L, 8284-21A, 8284-22A, or 5148-21L 1 processor	8247-22L, 8284-22A, or 5148-22L 2 processors
Slot 1	P1-C2 <sup>1,6</sup>	PCIe3, x8	Processor Module 2, Chip-1, PHB1	Low-profile	No	Yes	Yes	5	No	Yes
Slot 2	P1-C3 <sup>1</sup>	PCIe3, x16	Processor Module 2, Chip-1, PHB0	Low-profile	Yes	Yes	Yes	9	No	Yes
Slot 3	P1-C4 <sup>1,6</sup>	PCIe3, x8	Processor Module 2, Chip-0, PHB1	N/A	N/A	N/A	N/A	N/A	No	No
Slot 4	P1-C5 <sup>1</sup>	PCIe3, x16	Processor Module 2, Chip-0, PHB0	Low-profile	Yes	Yes	Yes	11	No	Yes
Slot 5	P1-C6 <sup>1</sup>	PCIe3, x16	Processor Module 1, Chip-1, PHB0	Low-profile	Yes	Yes	Yes	Default	Yes	Yes
Slot 6	P1-C7 <sup>1</sup>	PCIe3, x16	Processor Module 1, Chip-0, PHB0	Low-profile	Yes	Yes	Yes	Default	Yes	Yes
Slot 7	P1-C8 <sup>2</sup>	PCIe3, x8	PCIe3 Switch 2, S2P16	N/A	N/A	N/A	N/A	N/A	No	No
Slot 8	P1-C9 <sup>2,3</sup>	PCIe3, x8	PCIe3 Switch 2, S2P17	Low-profile	No	No	Yes	6, 8 <sup>4</sup>	Yes	Yes

Table 4. PCIe slot locations and descriptions for the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Slot	Location code	Description	PHB	Adapter size	Slot capabilities				Slot availability in	
					CAPI	SR-IOV	Dynamic direct memory access (DMA) window	I/O adapter enlarged capacity assign order <sup>5</sup>	8247-21L, 8284-21A, 8284-22A, or 5148-21L 1 processor	8247-22L, 8284-22A, or 5148-22L 2 processors
Slot 9	P1-C10 <sup>2,6</sup>	PCIe3, x8	PCIe3 Switch 2, S1P9	Low-profile	No	Yes	Yes	Default	Dedicated slot for the LAN adapter	
Slot 10	P1-C11 <sup>2</sup>	PCIe3, x8	PCIe3 Switch 1, S0P1	Low-profile	No	No	Yes	7	Yes	Yes
Slot 11	P1-C12 <sup>2,6</sup>	PCIe3, x8	PCIe3 Switch 1, S1P9	Low-profile	No	Yes	Yes	Default	Yes	Yes

<sup>1</sup>Slot is a direct slot from the Processor Module and is a high-performance slot. The connectors in these slots are differently colored than the slots from the PCIe3 switches.

<sup>2</sup>Slot connected by the PCIe3 switches.

<sup>3</sup>Slot is not available to install other adapters in the expanded function system backplane.

<sup>4</sup>The I/O Adapter Enlarged Capacity assignment order value is 6 for one processor or 8 for two processors.

<sup>5</sup>Assigned PCIe slot order when the I/O Adapter Enlarged Capacity option is enabled. For example, if the option was enabled with a value of 5 on a two processor system, five slots (P1-C6, P1-C7, P1-C10, P1-C12, and P1-C2) are enabled with the I/O enlarged capacity. If the option was enabled with a value of 7 on a two processor system, then six slots (P1-C6, P1-C7, P1-C10, P1-C12, P1-C2, and P1-C11) are enabled with the I/O enlarged capacity, and so on.

**Note:** Enabling the I/O Adapter Enlarged Capacity option will only affect Linux partitions. If your system does not have Linux partitions, the I/O Adapter Enlarged Capacity setting should be disabled.

<sup>6</sup>For platforms with less than 64GB of total system memory, SR-IOV should not be configured in these slots as performance may be severely impacted.

- All slots are PCIe generation 3 slots.
- The peak bandwidths supported by the x16 slots are 16 gigabytes per second (GBps) in simplex mode and 32 GBps in duplex mode.
- The peak bandwidths supported by the x8 slots are 8 GBps in simplex mode and 16 GBps in duplex mode.
- All slots support enhanced error handling (EEH).
- All PCIe slots are hot swappable and support concurrent maintenance.

## PCIe adapters placement rules

Use this information while selecting slots for installing PCIe adapters in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system. Use Table 5 on page 5 to identify slot placement priorities in the system and the maximum number of adapters that can be installed in the system

1. The slot P1-C10 must be used to install the local area network (LAN) adapter feature codes (FCs) EN0T, EN0V, or EN0X. Any other PCIe adapter feature is not supported in this slot.
2. The PCIe3 cable adapter (FC EJ05) is supported in slots P1-C6 and P1-C3.

**Note:** This is a double-wide adapter that requires two adjacent slots.

3. CAPI accelerator adapters are supported in slots P1-C6, P1-C7, P1-C3, and P1-C5.
4. Slots P1-C3, P1-C5, P1-C6, and P1-C7 are x16 slots with busses direct from the Processor Modules and can be used to install high-performance PCIe adapters. The adapter priority for these slots is for CAPI accelerator adapters (for example, EJ16), PCI accelerator adapters (for example, EJ13), and then for the high-performance adapters, followed by any other adapter.
5. Slots P1-C2 is an x8 slot with bus direct from the Processor Modules and can be used to install high-performance PCIe adapters. The adapter priority for this slot is for the high-performance adapters followed by any other adapter.

6. Slots P1-C2, P1-C3, P1-C5, P1-C6, and P1-C7 are slots with busses direct from the Processor Modules and are recommended for high-performance PCIe adapters that support the Single Root IO Virtualization (SR-IOV) function.
7. FCs 5901, 5278, 5284, and 5287 are not supported in the slots P1-C8, P1-C9, P1-C10, P1-C11, and P1-C12.
8. PCIe internal slots P1-C14 and P1-C15 are used to install the SAS RAID adapter FC EJ0V or EL3V and the high-performance internal SAS RAID adapter (CCIN 57D8).
9. When the high-performance internal SAS RAID adapter (CCIN 57D8) is installed, the FC EJ0Z is installed in PCIe slot P1-C9 and slot P1-C9 is not available for installing any other PCIe adapter. Slot P1-C9 is used to install the two external SAS ports.

Verify whether the adapter is supported for your system. For details about the supported adapters, see PCI adapter information by feature type for the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A ([http://www.ibm.com/support/knowledgecenter/POWER8/p8hcd/p8hcd\\_83x\\_8rx\\_pciyfeature.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8hcd/p8hcd_83x_8rx_pciyfeature.htm)).

*Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system*

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
5260	PCIe2 LP 4-port 1 GbE Adapter (FC 5260; CCIN 576F); Adapter FRU number: 74Y4064 <ul style="list-style-type: none"> <li>• PCIe1 or PCIe2 x4</li> <li>• Short, low-profile</li> <li>• High bandwidth</li> <li>• Four-port 1 Gb Ethernet</li> </ul> OS support: AIX, IBM i, Linux, PowerKVM, and VIOS operating systems	11, 10, 8 <sup>2</sup> , 6, 5	6	11, 2, 10, 8 <sup>2</sup> , 6, 4, 5	7	11, 10, 8 <sup>2</sup> , 6, 5	6	11, 10, 8 <sup>2</sup> , 6, 5	6	11, 2, 10, 8 <sup>2</sup> , 6, 4, 5	8
5269	POWER GXT145 PCI Express Graphics Accelerator (FC 5269; CCIN 5269); Adapter FRU number: 74Y3227 <ul style="list-style-type: none"> <li>• Low-profile adapter</li> <li>• Short, x1</li> </ul> OS support: Linux operating system	10, 8 <sup>2</sup> , 5, 6	4	10, 8 <sup>2</sup> , 1, 2, 4, 5, 6	7	10, 8 <sup>2</sup> , 5, 6	4	10, 8 <sup>2</sup> , 5, 6	4	10, 8 <sup>2</sup> , 1, 2, 4, 5, 6	7
5270	10 Gb FCoE PCIe Dual-port Adapter (FC 5270; CCIN 2B3B); Adapter FRU number: 46K8088 <ul style="list-style-type: none"> <li>• Low-profile adapter</li> <li>• Short, x8</li> <li>• Extra-high bandwidth</li> </ul> OS support (depending on the system you are using): <ul style="list-style-type: none"> <li>• AIX<sup>®</sup> and Linux operating systems</li> <li>• VIOS supported</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
5271	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5271; CCIN 5717); Adapter FRU number: 46Y3512  <ul style="list-style-type: none"> <li>Short, low-profile</li> <li>PCIe x4</li> </ul> OS support (depending on the system you are using): <ul style="list-style-type: none"> <li>AIX and Linux operating systems</li> <li>VIOS supported</li> </ul>	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8	Not supported	Not supported	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8
5273	PCIe2 8 Gb Dual-port Fibre Channel Adapter (FC 5273; CCIN 577D); Adapter FRU number: 10N9824  <ul style="list-style-type: none"> <li>PCIe2 x8</li> <li>Short, low-profile</li> </ul> OS support (depending on the system you are using): <ul style="list-style-type: none"> <li>AIX, IBM i, and Linux operating systems</li> <li>VIOS supported</li> </ul>	Not supported	Not supported	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
5274	2-port Gb Ethernet-SX PCI Express Adapter (FC 5274; CCIN 5768); Adapter FRU number: 10N6846  <ul style="list-style-type: none"> <li>Low-profile adapter</li> <li>Short, x4</li> </ul> OS support (depending on the system you are using): <ul style="list-style-type: none"> <li>AIX, IBM i, and Linux operating systems</li> <li>VIOS supported</li> </ul>	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8	Not supported	Not supported	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8
5275	10 Gb Ethernet-SR PCI Express Adapter (FC 5275; CCIN 5275); Adapter FRU number: 46K7897  <ul style="list-style-type: none"> <li>Low-profile adapter</li> <li>Short, x8</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
5276	4-Gb PCI Express Dual-port Fibre Channel Adapter (FC 5276; CCIN 5774); Adapter FRU number: 10N7255  <ul style="list-style-type: none"> <li>Low-profile adapter</li> <li>Short, x4</li> </ul> OS support: Linux operating system	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
5277	4-port Async EIA-232 PCIe 1X LP Adapter (FC 5277; CCIN 57D2); adapter FRU number 46K6734  <ul style="list-style-type: none"> <li>Low-profile adapter</li> <li>Extra-high bandwidth</li> <li>Short, x1</li> </ul> OS support: Linux operating system	10, 8 <sup>2</sup> , 5, 6	4	10, 8 <sup>2</sup> , 1, 2, 4, 5, 6	7	10, 8 <sup>2</sup> , 5, 6	4	10, 8 <sup>2</sup> , 5, 6	4	10, 8 <sup>2</sup> , 1, 2, 4, 5, 6	7

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
5278 <sup>3</sup>	PCIe Dual-x4 SAS Adapter (FC 5278; CCIN 57B3); Adapter FRU number: 44V4852 <ul style="list-style-type: none"> <li>• PCIe x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth</li> </ul> OS support: Linux operating system	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	5, 6	2	5, 2, 6, 4	4
5280	PCIe2 LP 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5280; CCIN 2B54); Adapter FRU number 74Y1988 <ul style="list-style-type: none"> <li>• Low-profile, short, x8</li> <li>• PCIe 2</li> </ul> OS support: Linux operating system	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
5281	1 Gb Ethernet UTP 2-port PCIe Adapter (FC 5281; CCIN 5767); Adapter FRU number: 46K6601 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> </ul> OS support: Linux operating system	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8	Not supported	Not supported	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8
5283	PCIe2 LP 2-port 4X InfiniBand QDR Adapter (FC 5283; CCIN 58E2); Adapter FRU number: 74Y2987 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Low profile</li> <li>• Extra-high bandwidth</li> <li>• Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2)</li> </ul> OS support: Linux operating system	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
5284 <sup>3</sup>	PCIe2 LP 2-port 10 GbE SR Adapter (FC 5284; CCIN 5287); Adapter FRU number: 74Y3242 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Low-profile</li> <li>• Extra-high bandwidth</li> <li>• 10 GBASE-SR short-reach optics</li> </ul>	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	5, 6	2	5, 2, 6, 4	2
EC27	PCIe2 LP 2-port 10 GbE RoCE SFP+ adapter (FC EC27; CCIN EC27); Adapter FRU number: 000E1493 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth, low latency 10 Gb Ethernet</li> <li>• OS support: AIX, Linux, and VIOS supports NIC capability only</li> </ul>	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EC29	PCIe2 LP 2-port 10 GbE RoCE SR adapter (FC EC29; CCIN EC29); Adapter FRU number: 00E1600 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth, low latency 10 Gb Ethernet</li> <li>• OS support: AIX, Linux, and VIOS supports NIC capability only</li> </ul>	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
EC2G	PCIe LP 2-Port 10 GbE SFN6122F Adapter (FC EC2G; CCIN EC2G); Adapter FRU number: 00E8224 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> <li>• High bandwidth</li> <li>• Supports Solarflare OpenOnload</li> <li>• OS support: Linux operating system</li> </ul>	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
EC2M <sup>4</sup>	PCIe3 LP 2-port 10 GbE NIC and RoCE SR adapter (FC EC2M; CCIN 57BE); Adapter FRU number: 00RX875, low-profile tailstock: 00RX872 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth, low latency 10 Gb Ethernet</li> <li>• Supports network interface controller (NIC) and RoCE services</li> <li>• OS support: AIX, IBM i only with VIOS, and Linux operating systems</li> </ul>	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
EC3A	PCIe3 LP 2-Port 40 GbE NIC RoCE QSFP+ Adapter (FC EC3A; CCIN 57BD); Adapter FRU number: 00FW105 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth, low latency 40 Gb Ethernet</li> <li>• Supports NIC and RoCE services</li> </ul> OS support (depending on the system you are using): AIX, Linux, and VIOS supports NIC capability only	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8



Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EC3E	PCIe3 2-port 100 Gb EDR IB Adapter x16 (FC EC3E and EC3F; CCIN 2CEA); Adapter FRU number: 00WT075 <ul style="list-style-type: none"> <li>• PCIe3 x16</li> <li>• Short, low-profile (FC EC3E)</li> <li>• Short, with full-height tailstock (FC EC3F)</li> <li>• OS support: Linux operating system</li> </ul>	5, 6	2	5, 2, 6, 4	4	Not supported	Not supported	5, 6	2	4, 6, 2, 5	4
EC3L	PCIe3 2-port 100 GbE (NIC and RoCE) QSFP28 Adapter (FC EC3L and EC3M; CCIN 2CEC); Adapter FRU number: 00WT078 <ul style="list-style-type: none"> <li>• PCIe3 x16</li> <li>• Short, low-profile (FC EC3L)</li> <li>• Short, with full-height tailstock (FC EC3M)</li> <li>• NIC and IBTA RoCE standards</li> <li>• OS support: AIX, IBM i, and Linux operating systems</li> </ul>	5, 6	2	5, 2, 6, 4	4	Not supported	Not supported	5, 6	2	4, 6, 2, 5	4
EC3T	PCIe3 LP 1-port 100 Gb EDR InfiniBand Adapter x16 (FC EC3T; CCIN 2CEB); Adapter FRU number: 00WT013 <ul style="list-style-type: none"> <li>• PCIe3 x16</li> <li>• Short, low-profile</li> <li>• OS support: Linux operating systems</li> </ul>	5, 6	2	5, 2, 6, 4	4	Not supported	Not supported	5, 6	2	4, 6, 2, 5	4
EC37 <sup>4</sup>	PCIe3 2-port 10 GbE NIC and RoCE SFP+ Copper Adapter (FC EC37; CCIN 57BC); Adapter FRU number: 00RX859 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Low-profile adapter</li> <li>• Extra-high bandwidth, low latency 10 Gb Ethernet</li> <li>• 10 Gb SFP+ ports can function in the NIC</li> <li>• OS support: AIX, IBM i only with VIOS, and Linux operating systems</li> </ul>	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EC41	PCIe2 LP 3D Graphics Adapter x1 (FC EC41); Adapter FRU number: 00E3980 <ul style="list-style-type: none"> <li>• PCIe 2.1 x1</li> <li>• Short, low-profile, half-length</li> <li>• Not hot-pluggable</li> <li>• Passive cooling</li> <li>• Supports two DVI-I displays with a required breakout cable</li> <li>• OS support: Linux and PowerKVM operating systems</li> <li>• Supported on Firmware level 7.8, or later</li> </ul>	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8	Not supported	Not supported	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8
EC45	PCIe2 LP 4-port USB 3.0 Adapter (FC EC45; CCIN 58F9); Adapter FRU number: 00E2932; low-profile tailstock part number: 00E2934 <ul style="list-style-type: none"> <li>• PCIe 2.2 x1</li> <li>• Short, low-profile, half-length adapter</li> <li>• Provides four downstream, external, high-speed Universal Serial Bus (USB) 3.0 ports</li> <li>• Supported on Firmware level 8.1, or later</li> </ul>	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8	11, 10, 8 <sup>2</sup> , 5, 6	5	11, 10, 8 <sup>2</sup> , 5, 6	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8
EC51	PCIe2 LP 3D Graphics Adapter x16 (FC EC51) <ul style="list-style-type: none"> <li>• PCIe 2.1 x16</li> <li>• Short, low-profile</li> <li>• Not hot-pluggable</li> <li>• Passive cooling</li> <li>• Provides 512 MB DDR3 graphics memory</li> <li>• OS support: Linux operating systems</li> </ul>	5, 6	2	2, 4, 5, 6	4	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EC54	PCIe3 1.6 TB NVMe Flash Adapter (FC EC54 and EC55; CCIN 58CB); Adapter FRU number: 00MH991 <ul style="list-style-type: none"> <li>• PCIe3 x4</li> <li>• Short, low-profile (FC EC54)</li> <li>• Short, with full-height tailstock (FC EC55)</li> <li>• 1.6 TB of low latency flash memory</li> <li>• OS support: Linux operating systems</li> </ul>	5, 6, 10 <sup>2</sup> , 8 <sup>6</sup> , 11	5	1, 2, 4, 5, 6, 8 <sup>6</sup> , 10	7	Not supported	Not supported	5, 6, 10 <sup>2</sup> , 8 <sup>6</sup> , 11	5	1, 2, 4, 5, 6, 8 <sup>6</sup> , 10	7

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EC54	<p>PCIe3 1.6 TB NVMe Flash Adapter (FC EC54 and EC55; CCIN 58CB); Adapter FRU number: 00MH991</p> <ul style="list-style-type: none"> <li>• PCIe3 x4</li> <li>• Short, low-profile (FC EC54)</li> <li>• Short, with full-height tailstock (FC EC55)</li> <li>• 1.6 TB of low latency flash memory</li> <li>• OS support: Linux operating systems</li> </ul>	5, 6, 10 <sup>2</sup> , 8 <sup>6</sup> , 11	5	1, 2, 4, 5, 6, 8 <sup>6</sup> , 10	7	Not supported	Not supported	5, 6, 10 <sup>2</sup> , 8 <sup>6</sup> , 11	5	1, 2, 4, 5, 6, 8 <sup>6</sup> , 10	7
EC56	<p>PCIe3 3.2 TB NVMe Flash Adapter (FC EC56 and EC57; CCIN 58CC); Adapter FRU number: 00MH993</p> <ul style="list-style-type: none"> <li>• PCIe3 x4</li> <li>• Short, low-profile (FC EC56)</li> <li>• Short, with full-height tailstock (FC EC57)</li> <li>• 3.2 TB of low latency flash memory</li> <li>• OS support: Linux operating systems</li> </ul>	5, 6, 10 <sup>2</sup> , 8 <sup>6</sup> , 11	5	1, 2, 4, 5, 6, 8 <sup>6</sup> , 10	7	Not supported	Not supported	5, 6, 10 <sup>2</sup> , 8 <sup>6</sup> , 11	5	1, 2, 4, 5, 6, 8 <sup>6</sup> , 10	7
EJ05	<p>PCIe3 cable adapter for the EMX0 PCIe Gen3 I/O expansion drawer (FC EJ05; CCIN 2B1C); Adapter FRU number: 000RR809</p> <ul style="list-style-type: none"> <li>• PCIe3 x16</li> <li>• Short, low-profile</li> <li>• Double-wide adapter requires two adjacent slots</li> <li>• Provides two CXP ports for the attachment of two expansion drawer cables</li> <li>• An expansion drawer cable pair attaches to one IO module (FC EMXF) in the EMX0 PCIe Gen3 I/O expansion drawer</li> </ul>	5-6	1	2-3, 5-6	2	Not supported	Not supported	5-6	1	2-3, 5-6	2
EJ0M	<p>PCIe3 RAID SAS quad-port 6 Gb LP Adapter (FC EJ0M; CCIN 57B4); Adapter FRU number: 000MH910</p> <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Transfer speed of 6 Gbps</li> <li>• No write cache</li> <li>• One PCIe slot per adapter</li> <li>• Adapters are installed in pairs to enable mirroring</li> <li>• OS support: AIX, IBM i, and Linux operating systems</li> </ul>	Not supported	Not supported	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EJ11	PCIe3 LP 4 x8 SAS Port Adapter (FC EJ11; CCIN 57B4); Adapter FRU number: 000MH910 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Transfer speed of 6 Gbps</li> <li>• Supports DVD and tape drives</li> <li>• No write cache</li> <li>• One PCIe x8 slot per adapter</li> <li>• OS support: AIX, IBM i, and Linux operating systems</li> </ul>	Not supported	Not supported	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
EJ13 <sup>5</sup>	PCIe3 LP FPGA Compression Accelerator Adapter (FC EJ13; CCIN 59AB); Adapter FRU number: 000NK006 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Field Programmable Gate Array (FPGA) accelerator adapter</li> <li>• One PCIe x8 or x16 slot per adapter (Low-profile)</li> <li>• OS support: AIX and Linux operating systems</li> </ul>	5, 6	2	1, 5, 2, 6, 4	4	Not supported	Not supported	5, 6	2	1, 5, 2, 6, 4	4
EJ16 <sup>5</sup>	PCIe3 LP CAPI Fibre Channel Flash Accelerator Adapter (FC EJ16); Adapter FRU number: 000NK025 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Coherent Accelerator Processor Interface (CAPI) adapter for Fibre Channel-attached Flash offload</li> <li>• One PCIe x16 slot per adapter</li> <li>• OS support: Linux Ubuntu operating system</li> </ul>	5, 6	1	5, 2, 6, 4	2	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EJ18 <sup>5</sup>	PCIe3 LP CAPI FlashSystem Accelerator Adapter (FC EJ18); Adapter FRU number: 000NK025 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Coherent Accelerator Processor Interface (CAPI) adapter for Fibre Channel-attached Flash offload</li> <li>• One PCIe x16 slot per adapter</li> <li>• OS support: AIX operating system</li> </ul>	Not supported	Not supported	Not supported	Not supported	5, 6	1	5, 6	1	5, 2, 6, 4	2

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EJ1B	<p>CAPI Compression Accelerator Adapter (FC EJ1A and EJ1B; CCIN 2CF0); Adapter FRU number: 00WT173</p> <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, with full-height tailstock (FC EJ1A)</li> <li>• Short, low-profile (FC EJ1B)</li> <li>• Up to 2 GB/sec compression and decompression throughput</li> <li>• CPU offload and CAPI interface with negligible software load</li> <li>• OS support: Linux operating systems</li> </ul>	4, 5	1	2, 4, 5, 6	2	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EJ1N	<p>PCIe SAS Tape/DVD Dual-port 3 Gb x8 Adapter (FC EJ1P and EJ1N; CCIN 57B3); Adapter FRU:44V4852</p> <ul style="list-style-type: none"> <li>• PCIe1 x8</li> <li>• Short, low-profile (FC EJ1N)</li> <li>• Short, with full-height tailstock (FC EJ1P)</li> <li>• Removable media device supported</li> <li>• OS support: AIX, IBM i, and Linux operating systems</li> <li>• VIOS supported</li> </ul>	5, 6	2	5, 2, 6, 4	4	Not supported	Not supported	5, 6	2	4, 6, 2, 5	4
EJ32	<p>4767-001 Cryptographic Coprocessor (FC EJ32 and EJ33; CCIN 4767)</p> <ul style="list-style-type: none"> <li>• PCIe1 x4</li> <li>• Half-length, with full-height tailstock (Dual Card)</li> <li>• Error Checking and Correction (ECC) Protection on DDR3 Memory</li> <li>• Over 300 Cryptographic algorithms and modes</li> <li>• OS support: AIX, IBM i, and Linux operating systems</li> </ul>	Not supported	6	Not supported	10	Not supported	Not supported	Not supported	6	Not supported	10
EJ1K	<p>PCIe3 1.92 TB CAPI NVMe Flash Accelerator Adapter (FC EJ1K; CCIN 58CD)</p> <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• 1.92 TB of low-latency flash memory</li> <li>• OS support: Linux Ubuntu operating system</li> </ul>	5, 6	2	2, 5, 4, 6	4	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EL09	PCIe LP 4 Gb 2-port Fibre Channel Adapter (FC EL09; CCIN 5774); adapter FRU number: 000E0807, 000E0904 <ul style="list-style-type: none"> <li>• PCIe x4</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth</li> <li>• OS support: Linux operating system</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL10 <sup>3</sup>	PCIe LP 2-port SAS Adapter 3 Gb (FC EL10; CCIN 57B3); Adapter FRU number: 44V4852 <ul style="list-style-type: none"> <li>• PCIe x4</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth</li> <li>• OS support: Linux operating system</li> </ul>	5, 6	2	5, 2, 6, 4	4	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL27	PCIe2 2-port 10 GbE RoCE SFP+ adapter (FC EL27; CCIN EC27); Adapter FRU number: 74Y1988 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth, low latency 10 Gb Ethernet</li> <li>• OS support: Linux and PowerKVM operating systems</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL2N	PCIe 8 Gb Dual-port Fibre Channel Adapter (FC EL2N; CCIN 577D); Adapter FRU number: 10N9824 <ul style="list-style-type: none"> <li>• PCIe x8</li> <li>• Short, low-profile</li> </ul> <p>OS support: Linux and PowerKVM operating systems</p>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL2P <sup>3</sup>	PCIe2 LP 2-port 10 GbE SR Adapter (FC EL2P; CCIN 5287); Adapter FRU number: 74Y3242 <ul style="list-style-type: none"> <li>• Generation 2, regular-height card, high-performance adapter</li> <li>• Capable of transferring data to a distance of 300 m over MMF-850 nm fiber cable</li> <li>• OS support: Red Hat Enterprise Linux and SUSE Linux Enterprise Server</li> </ul>	5, 6	2	5, 2, 6, 4	4	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EL2Z	PCIe2 LP 2-port 10 GbE RoCE SR adapter (FC EL2Z; CCIN EC29); Adapter FRU number: 00E1600 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth, low latency 10 Gb Ethernet</li> <li>• OS support: AIX, Linux, and PowerKVM operating systems</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL38	PCIe3 LP 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EL38; CCIN 2B93); Adapter FRU number: 000E9284 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• FCoE or NIC network convergence adapter</li> <li>• 10 Gb SFP+ ports can function in the NIC or FCoE mode</li> <li>• Supports the SR-IOV function</li> <li>• Extra-high bandwidth</li> <li>• OS support: Linux and PowerKVM operating systems</li> </ul>	5, 6, 9, 11	5	5, 2, 6, 4, 1, 9, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL39	PCIe LP 2-Port 10 GbE SFN6122F Adapter (FC EL39; CCIN EC2G); Adapter FRU number: 00E8224 <ul style="list-style-type: none"> <li>• Low-profile</li> <li>• High bandwidth</li> <li>• Supports Solarflare OpenOnload</li> <li>• OS support: Linux and PowerKVM operating systems</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL3B	PCIe3 LP RAID SAS Adapter (FC EL3B; CCIN 57B4); Adapter FRU number: 000MH910 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Low-profile, short</li> <li>• Transfer speed of 6 Gbps</li> <li>• No write cache</li> <li>• One PCIe x8 slot per adapter</li> <li>• Adapters can be installed singly or in pairs</li> <li>• OS support: Linux and PowerKVM operating systems</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EL3C	PCIe3 LP 4-port (10 Gb FCoE and 1 GbE) Copper and RJ45 Adapter (FC EL3C; CCIN 2CC1); Adapter FRU number: 00E8140 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Fibre Channel over Ethernet (FCoE) converged network adapter (CNA)</li> <li>• Extra-high bandwidth</li> <li>• Provides network interface controller (NIC)</li> <li>• Single root I/O virtualization (SR-IOV) capable</li> <li>• OS support: Linux operating system</li> </ul>	5, 6, 9, 11	5	5, 2, 6, 4, 1, 9, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL3D	PCIe3 LP 2-port 56 Gb FDR IB Adapter x16 (FC EL3D; CCIN 2CE7); Adapter FRU number: 00RX852 <ul style="list-style-type: none"> <li>• PCIe3 x16</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth, low latency 56 Gb Ethernet</li> <li>• OS support: Red Hat Enterprise Linux, SUSE Linux Enterprise Server, and Linux Ubuntu operating system</li> </ul>	5, 6	2	5, 2, 6, 4	4	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL3X	PCIe3 LP 2-port 10 GbE NIC and RoCE SFP+ Copper Adapter (FC EL3X; CCIN 57BC); Adapter FRU number: 0RX859; Low-profile tailstock: 00RX856 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth, low latency 10 Gb Ethernet</li> <li>• 10 Gb copper twinax small form-factor pluggable (SFP+) ports</li> <li>• OS support: Red Hat Enterprise Linux, SUSE Linux Enterprise Server, and Linux Ubuntu operating system</li> <li>• VIOS supports NIC capability only</li> </ul>	5, 6, 8, 10, 11	5	5, 2, 6, 4, 1, 8, 10, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported



Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EL3Z	<p>PCIe2 LP 2-port 10 GbE BaseT RJ45 Adapter (FC EL3Z; CCIN 2CC4); Adapter FRU number: 00E2714; Full-height tailstock part number: 00E2862; Low-profile tailstock part number: 00E2721</p> <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> <li>• Two 10 Gb RJ45 ports</li> <li>• Local area network (LAN) adapter</li> </ul> <p>OS support: Linux and PowerKVM operating systems</p>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL40	<p>PCIe3 LP 2-port 10 GbE NIC and RoCE SR Adapter (FC EL40; CCIN 57BE); Adapter FRU number: 00RX875</p> <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth, low latency 10 Gb Ethernet</li> <li>• 10 Gb SFP+ ports can function in the NIC</li> <li>• VIOS supports NIC capability only</li> <li>• OS support: Red Hat Enterprise Linux, SUSE Linux Enterprise Server, and Linux Ubuntu operating system</li> </ul>	5, 6, 8, 10, 11	5	5, 2, 6, 4, 1, 8, 10, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL43	<p>PCIe3 LP 16 Gb 2-port Fibre Channel Adapter (FC EL43; CCIN 577F); Adapter FRU number: 00E3496</p> <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth</li> <li>• OS support: Red Hat Enterprise Linux, SUSE Linux Enterprise Server, Linux Ubuntu operating system, and PowerKVM</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
EL4M	<p>PCIe2 4-port 1 GbE Adapter (FC EL4L and EL4M; CCIN 576F); Adapter FRU number: 74Y4064</p> <ul style="list-style-type: none"> <li>• PCIe1 or PCIe2 x4</li> <li>• Short, low-profile (FC EL4L)</li> <li>• Short, with full-height tail stock (FC EL4M)</li> <li>• High bandwidth</li> <li>• Four-port 1 Gb Ethernet</li> <li>• OS support: Linux operating system</li> </ul>	11, 10, 8 <sup>2</sup> , 6, 5	6	11, 1, 10, 8 <sup>2</sup> , 6, 4, 5	7	Not supported	Not supported	11, 10, 8 <sup>2</sup> , 6, 5	8	Not supported	Not supported

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EL60	PCIe3 LP 4 x8 SAS Port Adapter (FC EJ60; CCIN 57B4); Adapter FRU number: 000MH910 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Transfer speed of 6 Gbps</li> <li>• Supports DVD and tape drives</li> <li>• No write cache</li> <li>• One PCIe x8 slot per adapter</li> <li>• OS support: Linux and PowerKVM operating systems</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
EL5Y	PCIe2 8 Gb 2-Port Fibre Channel Adapter (FC EL5Y and EL5Z; CCIN 578D); Adapter FRU number: 00WT111 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile (FC EL5Y)</li> <li>• Short, plus (SFF+) Host Bus Adapter (HBA), with full-height tailstock (FC EL5Z)</li> <li>• Extra-high bandwidth</li> <li>• VIOS supported</li> <li>• OS support: Linux operating system</li> </ul>	5, 6, 8, 10, 11	5	5, 2, 6, 4, 1, 8, 10, 11	8	Not supported	Not supported	5, 6, 8, 10, 11	5	5, 2, 6, 4, 1, 8, 10, 11	8
EN0B	PCIe3 LP 16 Gb 2-port Fibre Channel Adapter (FC EN0B; CCIN 577F); Adapter FRU number: 000E9283 <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth</li> <li>• OS support: AIX, IBM i, Linux, and PowerKVM operating systems</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
EN0F	PCIe2 8Gb 2-Port Fibre Channel Adapter (FC EN0F and EN0G; CCIN 578D); Adapter FRU number: 00WT111 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, with low-profile tailstock (FC EN0F)</li> <li>• Short, plus (SFF+) Host Bus Adapter (HBA), with full-height tailstock (FC EN0G)</li> <li>• Extra-high bandwidth</li> <li>• VIOS supported</li> <li>• OS support: AIX, IBM i only with VIOS, and Linux operating systems</li> </ul>	5, 6, 8, 10, 11	5	5, 2, 6, 4, 1, 8, 10, 11	8	5, 6, 8, 10, 11	5	5, 6, 8, 10, 11	5	5, 2, 6, 4, 1, 8, 10, 11	8

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EN0J	<p>PCIe3 LP 4-port (2x10 Gb FCoE, 2x1 GbE) SFP+ Adapter (FC EN0J, CCIN 2B93); Adapter FRU number: 00E3498</p> <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• FCoE or NIC network convergence adapter</li> <li>• 10 Gb SFP+ ports can function in the NIC or FCoE mode</li> <li>• Supports the SR-IOV function</li> <li>• Extra-high bandwidth</li> <li>• OS support: AIX, IBM i only with VIOS, and Linux operating systems</li> </ul>	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	5, 6, 9, 11	5	5, 2, 6, 4, 1, 9, 11	8
EN0L	<p>PCIe3 LP 4-port (10 Gb FCoE and 1 GbE) Copper and RJ45 Adapter (FC EN0L; CCIN 2CC1)Adapter FRU number: 00E3502</p> <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Fibre Channel over Ethernet (FCoE) converged network adapter (CNA)</li> <li>• Extra-high bandwidth</li> <li>• Provides network interface controller (NIC)</li> <li>• Single root I/O virtualization (SR-IOV) capable</li> <li>• OS support: AIX, IBM i only with VIOS, and Linux operating systems</li> </ul>	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported	5, 6, 9, 11	5	5, 2, 6, 4, 1, 9, 11	8
EN0N	<p>PCIe3 LP 4-port (10 Gb FCoE and 1 GbE) LR and RJ45 Adapter (FC EN0N; CCIN 2CC0); Adapter FRU number: 00E8143; low-profile tailstock part number: 00E8163</p> <ul style="list-style-type: none"> <li>• PCIe3 x8</li> <li>• Short, low-profile</li> <li>• Extra-high bandwidth</li> <li>• Fibre Channel over Ethernet (FCoE) converged network adapter (CNA)</li> <li>• Provides network interface controller (NIC) function</li> <li>• Provides two Long Range (LR) optical ports with SFP+ optical transceivers</li> <li>• Functions in both dedicated and Single root I/O virtualization (SR-IOV) modes</li> <li>• OS support: AIX and Linux operating systems</li> <li>• VIOS supported</li> </ul>	5, 6, 9, 11	5	5, 2, 6, 4, 1, 9, 11	8	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EN0T	<p>PCIe2 LP 4-port (10 Gb + 1 GbE) SR+RJ45 Adapter (FC EN0T; CCIN 2CC3); Adapter FRU number: 00E2715; Low-profile tailstock (PN): 00E2720</p> <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> <li>• Two 10 Gb SR optical ports and two 1 Gb RJ45 ports</li> <li>• NIC network convergence adapter</li> <li>• Local area network (LAN) adapter</li> </ul> <p>OS support: Linux and PowerKVM operating systems</p>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
EN0V	<p>PCIe2 LP 4-port (10 Gb + 1 GbE) Copper SFP+RJ45 Adapter (FC EN0V; CCIN 2CC3); Adapter FRU number: 00E2715; low-profile tailstock: 00E2720</p> <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> <li>• Two 10 Gb copper twinax small form-factor pluggable (SFP+) ports</li> <li>• Two 1 Gb RJ45 ports</li> <li>• Ethernet network interface controller (NIC) function</li> <li>• OS support: AIX, IBM i only with VIOS, Linux, and PowerKVM operating systems</li> <li>• VIOS supported</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
EN0X	<p>PCIe2 LP 2-port 10 GbE BaseT RJ45 Adapter (FC EN0X; CCIN 2CC4); Adapter FRU number: 00E2714; low-profile tailstock part number: 00E2721</p> <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> <li>• Two 10 Gb RJ45 ports</li> <li>• Local area network (LAN) adapter</li> <li>• OS support: AIX, IBM i only with VIOS, Linux, and PowerKVM operating systems</li> </ul>	Not supported	Not supported	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8

Table 5. PCIe adapter slot priorities and maximum adapters supported in the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A system (continued)

Feature code	Description	8247-21L or 5148-21L		8247-22L or 5148-22L		8284-21A 1 processor		8284-22A 1 processor		8284-22A 2 processors	
		Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported	Slot priorities	Maximum number of adapters supported
EN0Y	PCIe2 LP 8 Gb 4-port Fibre Channel Adapter (FC EN0Y; CCIN EN0Y); Adapter FRU number: 74Y3923 <ul style="list-style-type: none"> <li>• PCIe2 x8</li> <li>• Short, low-profile</li> <li>• Short form factor plus (SFF+) Host Bus Adapter (HBA)</li> <li>• Extra-high bandwidth</li> <li>• OS support: AIX, IBM i only with VIOS, and Linux operating systems</li> </ul>	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8	Not supported	Not supported	5, 6, 8 <sup>2</sup> , 10, 11	5	5, 2, 6, 4, 1, 8 <sup>2</sup> , 10, 11	8
EN28	PCIe 2-port Async EIA-232 LP Adapter (FC EN28; CCIN 57D4); Adapter FRU number 000ND487 <ul style="list-style-type: none"> <li>• PCIe, x1</li> <li>• PCIe 1.1</li> <li>• Short, low-profile</li> <li>• Two ports through RJ45 by using the DB9 connector</li> <li>• EIA-232 Compatible</li> <li>• OS support: AIX, IBM i, Linux, and PowerKVM operating systems</li> </ul>	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8	Not supported	Not supported	11, 10, 8 <sup>2</sup> , 6, 5	5	11, 1, 10, 8 <sup>2</sup> , 2, 6, 4, 5	8

<sup>1</sup>The adapters are installed in this order in the system for best performance.

<sup>2</sup>The slot is not available to install other adapters in the expanded function system backplane.

<sup>3</sup>The adapters FCs 5278, 5284, EL10, and EL2P are not supported in slots 7, 8, 9, 10, and 11.

<sup>4</sup>The adapters FCs EC37 and EC2M are not supported in the 8284-22A system with processor card FCs EPXL and ELPF.

<sup>5</sup>The adapters FC EJ16, EJ17, and EJ18 are not compatible with the adapters FC EJ12 and EJ13. The FC EJ12 and EJ13 adapters are for gzip compression offload, and the FC EJ16, EJ17 and EJ18 are for direct-attach fibre channel flash acceleration.

<sup>6</sup>The slot is not available when the High Function RAID controller FC EJ0U is also installed.

## PCIe adapter placement rules and slot priorities for the EMX0 PCIe Gen3 I/O expansion drawer

Find information about the placement rules and slot priorities for the Peripheral Component Interconnect (PCI) Express (PCIe) adapters that are supported for the EMX0 PCIe Gen3 I/O expansion drawer (EMX0 PCIe3 expansion drawer).

### PCIe slot descriptions for the EMX0 PCIe3 expansion drawer

The number of PCIe slots that are provided in the EMX0 PCIe3 expansion drawer depends on the I/O module configuration of the EMX0 PCIe3 expansion drawer. Your configuration might have one or two PCIe3 6-slot fanout modules (FC EMXF or ELMF) installed in the rear of the EMX0 PCIe3 expansion drawer. Each PCIe3 6-slot fanout module provides six full-length, regular-height, PCIe generation 3 slots. The PCIe3 slots are compatible with generation 2 or generation 1 PCIe adapters. The PCIe slots use generation 3, single-wide, blind-swap cassettes.

The I/O module in the EMX0 PCIe3 expansion drawer is connected to the system with an expansion drawer cable pair. Each cable pair must be the same length and are attached to the T1 and T2 ports in the I/O module and to the corresponding ports in the PCIe3 cable adapter in the system.

Figure 2 shows the rear view of the EMX0 PCIe3 expansion drawer with the location codes for the PCIe adapter slots in the PCIe3 6-slot fanout module.

Table 6 lists the PCIe adapter slot locations and details for the EMX0 PCIe3 expansion drawer.

**Note:**

The left I/O module bay (as viewed from the rear) is configured with the first PCIe3 6-slot fanout module slot location codes P1-C1 through P1-C6.

The right I/O module bay (as viewed from the rear) is configured with the second PCIe3 6-slot fanout module slot location codes P2-C1 through P2-C6.

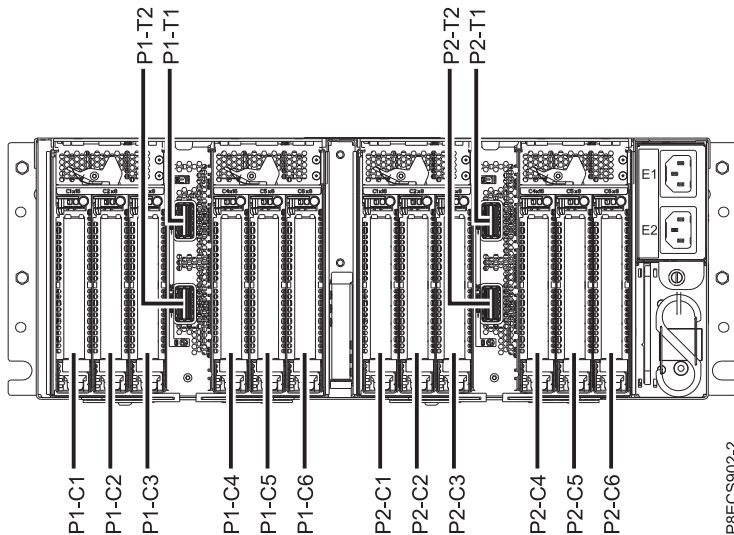


Figure 2. Rear view of a EMX0 PCIe3 expansion drawer with PCIe slot location codes

Table 6. PCIe slot locations and descriptions for the EMX0 PCIe3 expansion drawer.

Slot	Location code (Slot label)	Description	Slot capabilities		
			SR-IOV	Dynamic direct memory access (DMA) window	I/O Adapter Enlarged Capacity assignment order
Slot 1	P1-C1	PCIe3 x16	Yes	Yes	Yes <sup>3</sup>
Slot 2	P1-C2	PCIe3 x8	No	Yes <sup>2</sup>	No
Slot 3	P1-C3	PCIe3 x8	No	No	No
Slot 4	P1-C4	PCIe3 x16	Yes <sup>1</sup>	Yes <sup>2</sup>	No
Slot 5	P1-C5	PCIe3 x8	No	Yes <sup>2</sup>	No
Slot 6	P1-C6	PCIe3 x8	No	No	No
Slot 7	P2-C1	PCIe3 x16	Yes	Yes	Yes <sup>3</sup>
Slot 8	P2-C2	PCIe3 x8	No	Yes <sup>2</sup>	No
Slot 9	P2-C3	PCIe3 x8	No	No	No
Slot 10	P2-C4	PCIe3 x16	Yes <sup>1</sup>	Yes <sup>2</sup>	No
Slot 11	P2-C5	PCIe3 x8	No	Yes <sup>2</sup>	No
Slot 12	P2-C6	PCIe3 x8	No	No	No

Table 6. PCIe slot locations and descriptions for the EMX0 PCIe3 expansion drawer (continued).

Slot	Location code (Slot label)	Description	Slot capabilities		
			SR-IOV	Dynamic direct memory access (DMA) window	I/O Adapter Enlarged Capacity assignment order
<p><sup>1</sup>The SR-IOV capability varies in slots P1-C4 and P2-C4 based on the amount of system memory. If the EMX0 PCIe3 expansion drawer is connected to a system with a total amount of physical memory greater than or equal to 128 GB, slots P1-C4 and P2-C4 are SR-IOV capable.</p> <p><sup>2</sup>The Dynamic direct memory access (DMA) window capability varies based on the amount of system memory. If the EMX0 PCIe3 expansion drawer is connected to a system with a total amount of physical memory greater than or equal to 64 GB, the slot is Dynamic direct memory access (DMA) window capable. If the total amount of physical memory is less than 64 GB, the slot is not Dynamic direct memory access (DMA) window capable.</p> <p><sup>3</sup>Slots P1-C1 and P2-C1 inherit the I/O Adapter Enlarged Capacity attribute from the slot in the system that connects to the EMX0 PCIe3 expansion drawer.</p>					

**Notes:**

- All slots are PCIe generation 3 slots.
- All slots support full-length, regular-height adapters or short form-factor with a regular-height tailstock in single-wide, generation 3, blind-swap cassettes.
- Slots C1 and C4 in each PCIe3 6-slot fanout module are x16 PCIe3 buses and slots C2, C3, C5, and C6 are x8 PCIe buses.
- All slots support enhanced error handling (EEH).
- All PCIe slots are hot swappable and support concurrent maintenance.

**PCIe adapters placement rules**

Use this information while selecting slots for installing PCIe adapters in the EMX0 PCIe3 expansion drawer attached to the system. Use Table 7 on page 24 to identify slot placement priorities and the maximum number of adapters that can be installed in the EMX0 PCIe3 expansion drawer based on the operating system.

**Note:** You can click the link that appears in the feature code column for more technical information specific to the PCIe adapter.

1. If the EMX0 PCIe3 expansion drawer is configured with two PCIe3 6-slot fanout modules, distribute the PCIe adapters across both I/O modules whenever possible.
2. If FC EC46 is driving the internal DVD, it must be installed in the IO expansion drawer that is closest to the system. The system and IO expansion drawer must be in the same rack.

**Note:** If slot P1-C2 of the first node contains a controller adapter (CC), it must be the first option to consider for wiring the module (FanOut or DirectSlot) with the USB adapter driving the internal DVD. If it is a FanOut module, install FC EC46 in slot Px-C3 of the FanOut module.

3. Do not attempt to install x16 adapters in x8 slots. Doing so can damage the x16 connectors in the EMX0 PCIe3 expansion drawer.

Verify whether the adapter is supported for your system. For details about PCIe adapter placement rules and slot priorities, see PCIe adapter placement ([http://www.ibm.com/support/knowledgecenter/POWER8/p8hcd/p8hcd\\_emx0\\_pcibyfeature.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8hcd/p8hcd_emx0_pcibyfeature.htm)).

Table 7. PCIe adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer.

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX	Linux	IBM i
2893 and 2894	PCI Express 2-Line WAN with Modem (FC 2893 and FC 2894; CCIN 576C); Adapter FRU number: 44V5323	6, 12	0	1	1
5285	PCIe2 2-port 4X InfiniBand QDR Adapter (FC 5285; CCIN 58E2); Adapter FRU number: 74Y2987	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
5287	PCIe2 2-port 10 GbE SR Adapter (FC 5287; CCIN 5287); Adapter FRU number: 74Y3457	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
5708	PCIe 10 Gb FCoE 2-port Adapter (FC 5708; CCIN 2B3B)	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
5717	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5717; CCIN 5217); Adapter FRU number: 46Y3512	2, 8, 3, 9, 5, 11, 6, 12, 1, 7, 4, 10	6	6	0
5729	PCIe2 FH 4-port 8 Gb74Y3467 Fibre Channel Adapter (FC 5729; CCIN 5729); Adapter FRU number: 74Y3467	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
5735	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5735; CCIN 577D); Adapter FRU number: 10N9824	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	6
5744	PCIe2 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5744; CCIN 2B44); Adapter FRU number: 74Y1987	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	6
5767	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter (FC 5767; CCIN 5767); Adapter FRU number: 46K6601	2, 8, 3, 9, 5, 11, 6, 12, 1, 7, 4, 10	6	6	6
5768	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5735; CCIN 577D); Adapter FRU number: 10N9824	2, 8, 3, 9, 5, 11, 6, 12, 1, 7, 4, 10	6	6	6
5769	10 Gb Ethernet-SR PCI Express Adapter (FC 5769; CCIN 5769); Adapter FRU number: 46K7897	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
5772	10 Gb Ethernet-LR PCI Express Adapter (FC 5772; CCIN 576E); Adapter FRU number: 10N9034	2, 8, 5, 11, 3, 9, 6, 12, 1, 7, 4, 10	6	6	0



Table 7. PCIe adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer (continued).

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX	Linux	IBM i
5774	4 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5774; CCIN 5774); Adapter FRU number: 10N7255	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	6
5785	4-port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2); Adapter FRU number: 46K6734	6, 12	1	1	0
5805	PCIe 380 MB Cache Dual - x4 3 Gb SAS RAID Adapter (FC 5805; CCIN 574E); Adapter FRU number: 46K4735	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
5899	PCIe2 4-port 1 GbE Adapter (FC 5899; CCIN 576F); Adapter FRU number: 74Y4064	2, 8, 3, 9, 5, 11, 6, 12, 1, 7, 4, 10	6	6	6
5901	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3); Adapter FRU number: 44V4852	2, 8, 5, 11, 3, 9, 6, 12, 1, 7, 4, 10	6	6	6
5913	PCIe2 1.8 GB Cache RAID SAS Tri-port 6 Gb Adapter (FC 5913; CCIN 57B5); Adapter FRU number: 00J0596	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	6
EC28	PCIe2 2-port 10 GbE RoCE SFP+ adapter (FC EC28; CCIN EC27); Adapter FRU number: 000E1491	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EC2J	PCIe 2-Port 10 GbE SFN6122F Adapter (FC EC2J; CCIN EC2G); Adapter FRU number: 00E8224	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	0	6	0
EC2N	PCIe3 2-port 10 GbE NIC and RoCE SR adapter (FC EC2N; CCIN 57BE); Adapter FRU number: 00RX875	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EC30	PCIe2 FH 2-port 10 GbE RoCE SR adapter (FC EC30; CCIN EC29); Adapter FRU number: 00E1601	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EC38	PCIe3 2-port 10 GbE NIC and RoCE SFP+ Copper Adapter (FC EC38; CCIN 57BC); Adapter FRU number: 00RX859	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EC3B	PCIe3 2-Port 40 GbE NIC RoCE QSFP+ Adapter (FC EC3B; CCIN 57BD); Adapter FRU number: 00FW105	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0

Table 7. PCIe adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer (continued).

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX	Linux	IBM i
EC46	PCIe2 4-port USB 3.0 Adapter (FC EC46; CCIN 58F9); Adapter FRU number: 00E2932	2, 8, 5, 11, 3, 9, 6, 12, 1, 7, 4, 10	6	6	6
EJ0J	PCIe3 RAID SAS quad-port 6 Gb Adapter (FC EJ0J; CCIN 57B4); Adapter FRU number: 000FX846	1, 7, 4, 10, 3, 9, 6, 12	4	4	4
EJ0L	PCIe3 12 GB Cache RAID SAS quad-port 6 Gb Adapter (FC EJ0L; CCIN 57CE); Adapter FRU number: 00FX840	1, 7, 4, 10, 3, 9, 6, 12	4	4	4
EJ10	PCIe3 4 x8 SAS Port Adapter (FC EJ10; CCIN 57B4); Adapter FRU number: 00RR793 for 8408-44E or 8408-E8E and 00MH959 for all other machine type models	1, 7, 4, 10, 3, 9, 6, 12	4	4	4
EJ14	PCIe3 12 GB Cache RAID PLUS SAS Adapter Quad-port 6 Gb x8 (FC EJ14; CCIN 57B1); Adapter FRU number 01DH742	1, 7, 4, 10, 3, 9, 6, 12	4	4	4
EJ1P	PCIe1 SAS Tape/DVD Dual-port 3 Gb x8 Adapter (FC EJ1P and EJ1N; CCIN 57B3); Adapter FRU:44V4852	2, 5, 3, 6, 1, 4	6	6	6
EJ27, EJ28, and EJ29	PCIe Cryptographic Coprocessor (FC EJ27, FC EJ28, and FC EJ29; CCIN 476A); Adapter FRU number: 45D7948	2, 8, 5, 11, 3, 9, 6, 12, 1, 7, 4, 10	6	0	6
EJ33	4767-001 Cryptographic Coprocessor (FC EJ32 and EJ33; CCIN 4767) <ul style="list-style-type: none"> <li>• PCIe1 x4</li> <li>• Half-length, with full-height tailstock (Dual Card)</li> <li>• Error Checking and Correction (ECC) Protection on DDR3 Memory</li> <li>• Over 300 Cryptographic algorithms and modes</li> <li>• OS support: AIX, IBM i, and Linux operating systems</li> </ul>	2, 5, 3, 6, 1, 4	6	6	6
EL4L	PCIe2 4-port 1 GbE Adapter (FC EL4L and EL4M; CCIN 576F); Adapter FRU number: 74Y4064	2, 8, 3, 9, 5, 11, 6, 12, 1, 7, 4, 10	6	6	6

Table 7. PCIe adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer (continued).

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX	Linux	IBM i
EL53	PCIe3 2-port 10 GbE NIC and RoCE SFP+ Copper Adapter (FC EL53; CCIN 57BC); Adapter FRU number: 00RX859; Low-profile tailstock: 00RX856	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EL54	PCIe3 2-port 10 GbE NIC and RoCE SR adapter (FC EL54; CCIN 57BE); Adapter FRU number: 00RX875	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EL55	PCIe2 2-port 10 GbE BaseT RJ45 Adapter (FC EL55; CCIN 2CC4); Adapter FRU number: 00E2714	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EL56	PCIe2 4-port (2x10 Gb FCoE, 2x1 GbE) SFP+ Adapter (FC EL56, CCIN 2B93); Adapter FRU number: 00E3498	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EL57	PCIe2 4-port (10 Gb FCoE and 1 GbE) Copper and RJ45 Adapter (FC EL57; CCIN 2CC1); Adapter FRU number: 00E8140	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EL58	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC EL58; CCIN 577D); Adapter FRU number: 10N9824	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	6
EL59	PCIe3 RAID SAS quad-port 6 Gb Adapter (FC EL59; CCIN 57B4); Adapter FRU number: 000E9284	1, 7, 4, 10, 3, 9, 6, 12	4	4	4
EL5B	PCIe3 16 Gb 2-port Fibre Channel Adapter (FC EL5B; CCIN 577F); Adapter FRU number: 00E3496	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	6
EN0A	PCIe3 16 Gb 2-port Fibre Channel Adapter (FC EN0A; CCIN 577F); Adapter FRU number: 00E3496	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	6
EN0G	PCIe2 8Gb 2-Port Fibre Channel Adapter (FC EN0F and EN0G; CCIN 578D); Adapter FRU number: 00WT111	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EN0H	PCIe3 4-port (2x10 Gb FCoE, 2x1 GbE) SFP+ Adapter (FC EN0H; CCIN 2B93); Adapter FRU number: 00E3498	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0

Table 7. PCIe adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer (continued).

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX	Linux	IBM i
EN0K	PCIe3 4-port (10 Gb FCoE and 1 GbE) Copper and RJ45 Adapter (FC EN0K; CCIN 2CC1); Adapter FRU number: 00E8140	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EN0M	PCIe3 4-port (10 Gb FCoE and 1 GbE) LR and RJ45 Adapter (FC EN0M; CCIN 2CC0); Adapter FRU number: 00E8144	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EN0S	PCIe2 4-port (10 Gb + 1 GbE) SR+RJ45 Adapter (FC EN0S; CCIN 2CC3); Adapter FRU number: 00E2715; Part number (Full-height tailstock): 00E2863; Part number (Low-profile tailstock): 00E2720	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EN0U	PCIe2 4-port (10 Gb + 1 GbE) Copper SFP+RJ45 Adapter (FC EN0U; CCIN 2CC3); Adapter FRU number: 00E2715; low-profile tailstock: 00E2720	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EN0W	PCIe2 2-port 10 GbE BaseT RJ45 Adapter (FC EN0W; CCIN 2CC4); Adapter FRU number: 00E2714	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EN12	PCIe2 FH 4-port 8 Gb Fibre Channel Adapter (FC EN12; CCIN EN0Y); Adapter FRU number 00WT107	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	0
EN13 and EN14	PCIe Binary Synchronous Adapter (FC EN13 and FC EN14; CCIN 576C)	6, 12	0	0	1
EN15	PCIe3 4-port 10 GbE SR Adapter (FC EN15; CCIN 2CE3); Adapter FRU number: 00ND466; full-height tailstock: 00ND462	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	6
EN17	PCIe3 4-port 10 GbE SFP+ Copper Adapter (FC EN17, CCIN 2CE4); Adapter FRU number: 00ND463; full-height tailstock part number: 00ND465	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	6
EN27	PCIe 2-port Async EIA-232 Adapter (FC EN27; CCIN 57D4); Adapter FRU number: 00ND487	2, 8, 3, 9, 5, 11, 6, 12, 1, 7, 4, 10	6	6	6

Table 7. PCIe adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer (continued).

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX	Linux	IBM i
EN29	PCIe 2-port Async EIA-232 LP Adapter (FC EN29; CCIN 57D4); adapter FRU number 000ND487	2, 8, 3, 9, 5, 11, 6, 12, 1, 7, 4, 10	0	0	6
ESA3	PCIe2 1.8 GB Cache RAID SAS Adapter Tri-port 6 Gb (FC ESA3; CCIN 57BB); Adapter FRU number: 74Y7131	1, 7, 4, 10, 2, 8, 3, 9, 5, 11, 6, 12	6	6	6

<sup>1</sup>The slot priority sequence is based on a EMX0 PCIe3 expansion drawer configured with two PCIe3 6-slot fanout modules.

<sup>2</sup>The maximum number of adapters supported per PCIe3 6-slot fanout module.

## Related procedures for PCI adapter placement

Find procedures that are related to PCI adapter placement rules and slot priorities.

### Finding the current system configuration in IBM i

You can use the System Service Tools in the IBM i operating system to find the current system configuration.

Before you begin, you must know the location codes of the PCI adapter slots in the system with which you are working.

To find the current system configuration, start an IBM i session and sign on. If you have more than one system, start a session on the system that is being upgraded and for which you have service tools authority.

To find the current system configuration, complete the following steps:

1. Type **strsst** on the command line of the Main Menu and then press **Enter**.
2. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display and then press **Enter**.
3. Select **Start a service tool** from the System Service Tools (SST) display and then press **Enter**.
4. Select **Hardware service manager** from the Start a Service Tool display and then press **Enter**.
5. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display and then press **Enter**.
6. Type **9** on the **System Unit** line and then press **Enter**.
7. Select **Include empty positions**.
8. Look for the PCI adapter location codes in the **Location** column.
9. Write down the Type-Model number for each PCI adapter location. Some adapters can show multiple, virtual ports. It is not necessary to write down these virtual locations.
10. Write down any PCI adapter locations that are listed in the **Description** column as an Empty Position. The Type-Model number is blank for empty positions.
11. Press **F12** to return to the previous window.

12. Do you have an expansion unit attached?
- **No:** Go to “PCIe adapter placement rules and slot priorities for the 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A” on page 1
  - **Yes:** Do the following tasks:
    - a. Type **9** for the **System Expansion Unit** field and press Enter.
    - b. Repeat steps 7-11 for each expansion unit.
    - c. Select an available slot in the expansion unit.

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## Accessibility features for IBM Power Systems servers

Accessibility features assist users who have a disability, such as restricted mobility or limited vision, to use information technology content successfully.

### Overview

The IBM Power Systems servers include the following major accessibility features:

- Keyboard-only operation
- Operations that use a screen reader

The IBM Power Systems servers use the latest W3C Standard, WAI-ARIA 1.0 ([www.w3.org/TR/wai-aria/](http://www.w3.org/TR/wai-aria/)), to ensure compliance with US Section 508 ([www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards](http://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards)) and Web Content Accessibility Guidelines (WCAG) 2.0 ([www.w3.org/TR/WCAG20/](http://www.w3.org/TR/WCAG20/)). To take advantage of accessibility features, use the latest release of your screen reader and the latest web browser that is supported by the IBM Power Systems servers.

The IBM Power Systems servers online product documentation in IBM Knowledge Center is enabled for accessibility. The accessibility features of IBM Knowledge Center are described in the Accessibility section of the IBM Knowledge Center help ([www.ibm.com/support/knowledgcenter/doc/kc\\_help.html#accessibility](http://www.ibm.com/support/knowledgcenter/doc/kc_help.html#accessibility)).



## Keyboard navigation

This product uses standard navigation keys.

## Interface information

The IBM Power Systems servers user interfaces do not have content that flashes 2 - 55 times per second.

The IBM Power Systems servers web user interface relies on cascading style sheets to render content properly and to provide a usable experience. The application provides an equivalent way for low-vision users to use system display settings, including high-contrast mode. You can control font size by using the device or web browser settings.

The IBM Power Systems servers web user interface includes WAI-ARIA navigational landmarks that you can use to quickly navigate to functional areas in the application.

## Vendor software

The IBM Power Systems servers include certain vendor software that is not covered under the IBM license agreement. IBM makes no representation about the accessibility features of these products. Contact the vendor for accessibility information about its products.

## Related accessibility information

In addition to standard IBM help desk and support websites, IBM has a TTY telephone service for use by deaf or hard of hearing customers to access sales and support services:

TTY service  
800-IBM-3383 (800-426-3383)  
(within North America)

For more information about the commitment that IBM has to accessibility, see IBM Accessibility ([www.ibm.com/able](http://www.ibm.com/able)).

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When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

## Class A Notices

The following Class A statements apply to the IBM servers that contain the POWER8 processor and its features unless designated as electromagnetic compatibility (EMC) Class B in the feature information.

## Federal Communications Commission (FCC) Statement

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## Industry Canada Compliance Statement

CAN ICES-3 (A)/NMB-3(A)

## European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2014/30/EU on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

European Community contact:  
IBM Deutschland GmbH  
Technical Regulations, Abteilung M456

IBM-Allee 1, 71139 Ehningen, Germany  
Tel: +49 800 225 5426  
email: halloibm@de.ibm.com

**Warning:** This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

### VCCI Statement - Japan

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### Japan Electronics and Information Technology Industries Association Statement

This statement explains the Japan JIS C 61000-3-2 product wattage compliance.

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This statement explains the Japan Electronics and Information Technology Industries Association (JEITA) statement for products less than or equal to 20 A per phase.

高調波電流規格 JIS C 61000-3-2 適合品

This statement explains the JEITA statement for products greater than 20 A, single phase.

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。

- 回路分類 : 6 (単相、PFC回路付)
- 換算係数 : 0

This statement explains the JEITA statement for products greater than 20 A per phase, three-phase.

高調波電流規格 JIS C 61000-3-2 準用品

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- 換算係数 : 0

### Electromagnetic Interference (EMI) Statement - People's Republic of China

声 明

此为 A 级产品,在生活环境中,该产品可能会造成无线电干扰。在这种情况下,可能需要用户对其干扰采取切实可行的措施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

### Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者：

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**IBM Taiwan Contact Information:**

台灣IBM 產品服務聯絡方式：  
台灣國際商業機器股份有限公司  
台北市松仁路7號3樓  
電話：0800-016-888

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**Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten**

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

**Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse A**

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:  
International Business Machines Corp.  
New Orchard Road

Armonk, New York 10504  
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:  
IBM Deutschland GmbH  
Technical Relations Europe, Abteilung M456  
IBM-Allee 1, 71139 Ehningen, Germany  
Tel: +49 (0) 800 225 5426  
email: HalloIBM@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 / EN 55032 Klasse A.

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If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM-authorized dealer or service representative for help.

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This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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CAN ICES-3 (B)/NMB-3(B)

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Tel: +49 800 225 5426  
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### Japan Electronics and Information Technology Industries Association Statement

This statement explains the Japan JIS C 61000-3-2 product wattage compliance.

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仕様ページ参照

This statement explains the Japan Electronics and Information Technology Industries Association (JEITA) statement for products less than or equal to 20 A per phase.

高調波電流規格 JIS C 61000-3-2 適合品

This statement explains the JEITA statement for products greater than 20 A, single phase.

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- 換算係数 : 0

This statement explains the JEITA statement for products greater than 20 A per phase, three-phase.

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- 回路分類 : 5 (3相、PFC回路付)
- 換算係数 : 0

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台灣國際商業機器股份有限公司  
台北市松仁路7號3樓  
電話：0800-016-888

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**Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten**



Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

**Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse B**

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:  
International Business Machines Corp.  
New Orchard Road  
Armonk, New York 10504  
Tel: 914-499-1900

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