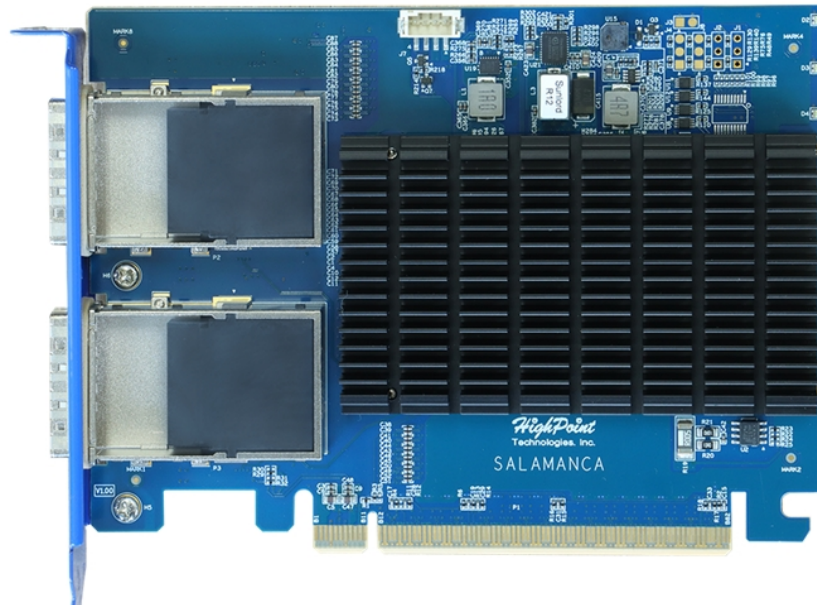




# **Rocket 1638E (R1638E)**

## **Gen5 External Adapter User Guide**



**V1.00 - August 24, 2026**

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# 1. Overview

The R1638E is the latest member of our PCIe Gen5 External Adapter product family. It redefines system-side external expansion with native support for GPU chassis via CopprLink. Leveraging the cutting-edge PCIe 5.0 x16 interface delivering up to 64GB/s per port, this adapter unlocks high-speed external connectivity. Optimized for professionals demanding GPU-accelerated workloads, it provides exceptional performance for enterprise-grade data processing tasks.

## 1.1. Key Features

- Dedicated PCIe 5.0 x16 host interface
- Provide two CDFP connectors
- Support up two Enclosures
- Complies with CopprLink Copmliant standard
- Support data transfer rate 64GB/s
- FRU Inventory support
- Software Secure Boot
- Hardware Secure Boot
- Downstream port containment
- Real-Time Power Measurement
- Support LED Management
- Support the following Operating Systems:
  - Microsoft Windows
  - Linux

### 1.1.1. FRU

The *Field Replacement Unit (FRU)* ensures smooth operation and efficient maintenance of complex systems. The unit is designed to house and protect vital product data (VPD).

Information fields within a VPD resource type contain a three-byte header and some data. The three-byte header contains a two-byte keyword and a one-byte length. A keyword is a two-character (ASCII) mnemonic that uniquely identifies the information in the field. The last byte of the header is binary and represents the length value (in bytes) of the following data.

In the event of a hardware failure, the *FRU* can be quickly replaced, returning the device to a fully functional state without requiring extensive diagnostics or data recovery. This reduces downtime and minimizes the possibility of data loss, ensuring that critical operations can continue uninterrupted.

The following table describes the details and descriptions of the VPD.

**Table 1: Details and Descriptions of the VPD**

| Key Word | Details                  | Descriptions                                                                                                                                                                                                     |
|----------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PN       | AIC Part Number          | This keyword is an extension to the Device ID (or Subsystem ID) in the Configuration Space header.                                                                                                               |
| EC       | Engineering Change Level | The characters are alphanumeric and represent the engineering change level for this add-in card.                                                                                                                 |
| MN       | Manufacture ID           | This keyword is an extension of the Vendor ID (or Subsystem Vendor ID) in the Configuration Space header. It allows vendors to identify an additional level of detail regarding the sourcing of this device.     |
| SN       | Serial Number            | The characters are alphanumeric and represent the unique add-in card Serial Number.                                                                                                                              |
| Vx       | Vendor Specific          | This is a vendor-specific item, and the characters are alphanumeric. The keyword's second character (x) can be 0 through 9 or A through Z.<br><br>V0 indicates the Vendor Name<br><br>V1 indicates the Main Chip |

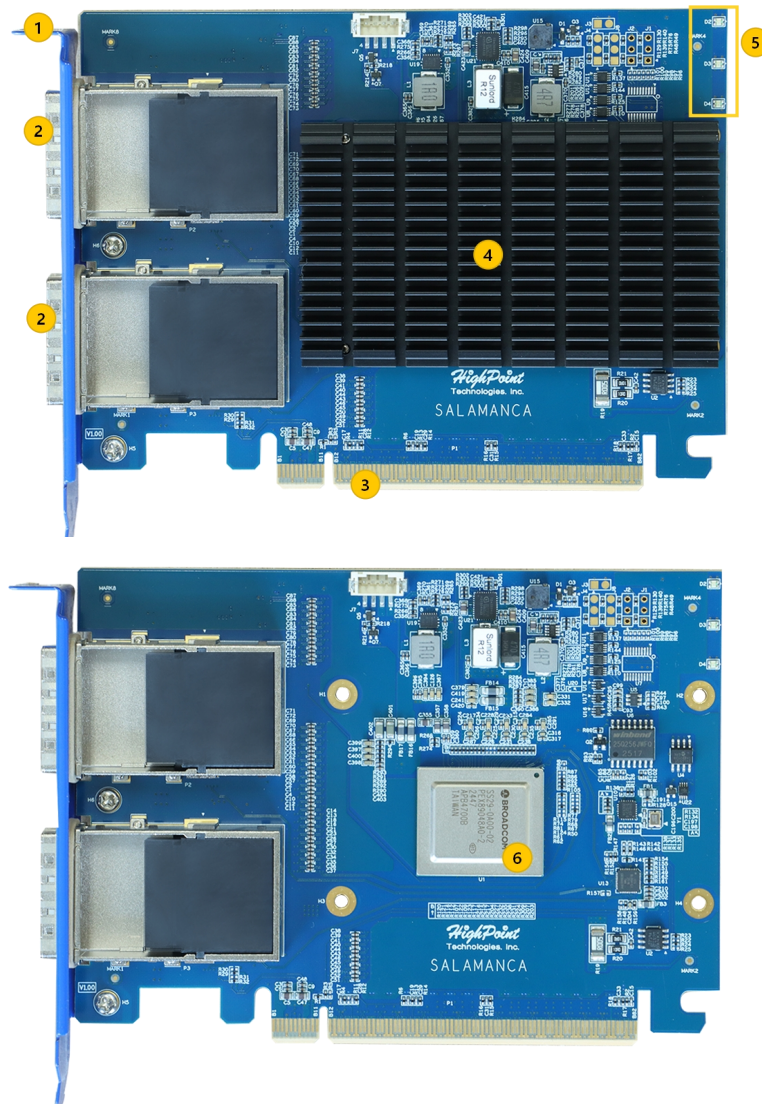
### 1.1.2. Hardware Secure Boot

The secure boot feature permits only authenticated firmware to execute. The switch boots the root of the trusted firmware from the internal boot ROM (IBR) and uses that firmware to authenticate the external firmware stored in the SPI flash and prevent the execution of unauthenticated code.

## 2. R1638E Hardware Description

### 2.1. R1638E Layout

The following figure shows the key components of the R1638E.



The following table describes the key components of the R1638E.

**Table 2: Key component of the R1638E**

| Number | Type                | Description                                                                                                                                                          |
|--------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①      | Bracket             | Full-height bracket.<br>The R1638E is secured to the chassis by a bracket.                                                                                           |
| ②      | CDFP Connector      | Two CDFP connectors. Connect the controller card using the CDFP cable to the Enclosure.                                                                              |
| ③      | PCIe Host Interface | PCIe 5.0 x16 host interface. The interface between the host interface card and the host system. With the PCIe interface, this connector provides power to the board. |

|   |                |                                                                                                                                                                                                                                                                                                                                                                             |
|---|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ④ | Cooling System | Passive Heatsink.<br>Used to dissipate heat from electronic components prone to heat generation.                                                                                                                                                                                                                                                                            |
| ⑤ | Diagnostic LED | <p>CDFP Status LEDs and Host Status LED. Refer <a href="#">here</a>.</p>  <ul style="list-style-type: none"> <li>● Host Status LED -- The status of the host interface card PCIe bandwidth.</li> <li>● CDFP1 &amp; 2 Status LED -- The bandwidth of the Enclosure MCU feedback.</li> </ul> |
| ⑥ | Chip           | Broadcom PEX 89048 chip.                                                                                                                                                                                                                                                                                                                                                    |

The following figure shows the LED Indicators of the R1638E

**Table 3: LED Indicators of the R1638E**

| LED                             | Color                                                                                  | Status              | Description                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------|
| <b>CDFP 1&amp; 2 Status LED</b> |      | <b>OFF</b>          | No device is connected to the port.                                                                    |
|                                 |     | <b>Solid Blue</b>   | The CDFP status is working at PCIe 5.0 with 1 x16 Mode.                                                |
|                                 |     | <b>Solid Green</b>  | The CDFP status is working at PCIe 5.0 with 4 x4 Mode.                                                 |
|                                 |     | <b>Solid Red</b>    | Unknown Configuration.                                                                                 |
|                                 |     | <b>Flash Blue</b>   | The LED blinks red at 1 Hz to indicate that the CDFP status is working at not PCIe 5.0 but 1 x16 Mode. |
|                                 |     | <b>Flash Green</b>  | The LED blinks red at 1 Hz to indicate that the CDFP status is working at not PCIe 5.0 but 4 x4 Mode.  |
| <b>Host Status LED</b>          |     | <b>OFF</b>          | The R1638E is powered off.                                                                             |
|                                 | <b>Note:</b> The following represents the bandwidth status of the host interface card. |                     |                                                                                                        |
|                                 |     | <b>Solid Blue</b>   | PCIe 5.0 x16.                                                                                          |
|                                 |     | <b>Solid Green</b>  | PCIe 5.0 x8 or PCIe 4.0 x16.                                                                           |
|                                 |     | <b>Solid Yellow</b> | PCIe 5.0 x4 or PCIe 4.0 x8 or PCIe 3.0 x16.                                                            |
|                                 |     | <b>Solid Cyan</b>   | PCIe 4.0 x4 or PCIe 3.0 x8.                                                                            |
|                                 |     | <b>Solid White</b>  | PCIe 3.0 x4.                                                                                           |
|                                 |     | <b>Solid Red</b>    | Not appear as above.                                                                                   |

## 2.2. PCIe Host Interface

The R1638E's PCIe 5.0 host interface provides maximum transmission. Other PCIe host interface features include the following:

- 16-lane PCIe host interface
- Support of x16 link width
- 16-lane aggregate bandwidth of up to 64GB/s

## 2.3. Enclosure Bus Interface

The R1638E has two CDFP connectors. Other features include the following:

- Dedicated PCIe 5.0 x16 port
- Each port supports one Enclosure
- Data transfer at 64GB/s

## 2.4. Basic Specifications

The following table describes the basic specifications of the R1638E.

**Table 4: Basic Specifications of R1638E**

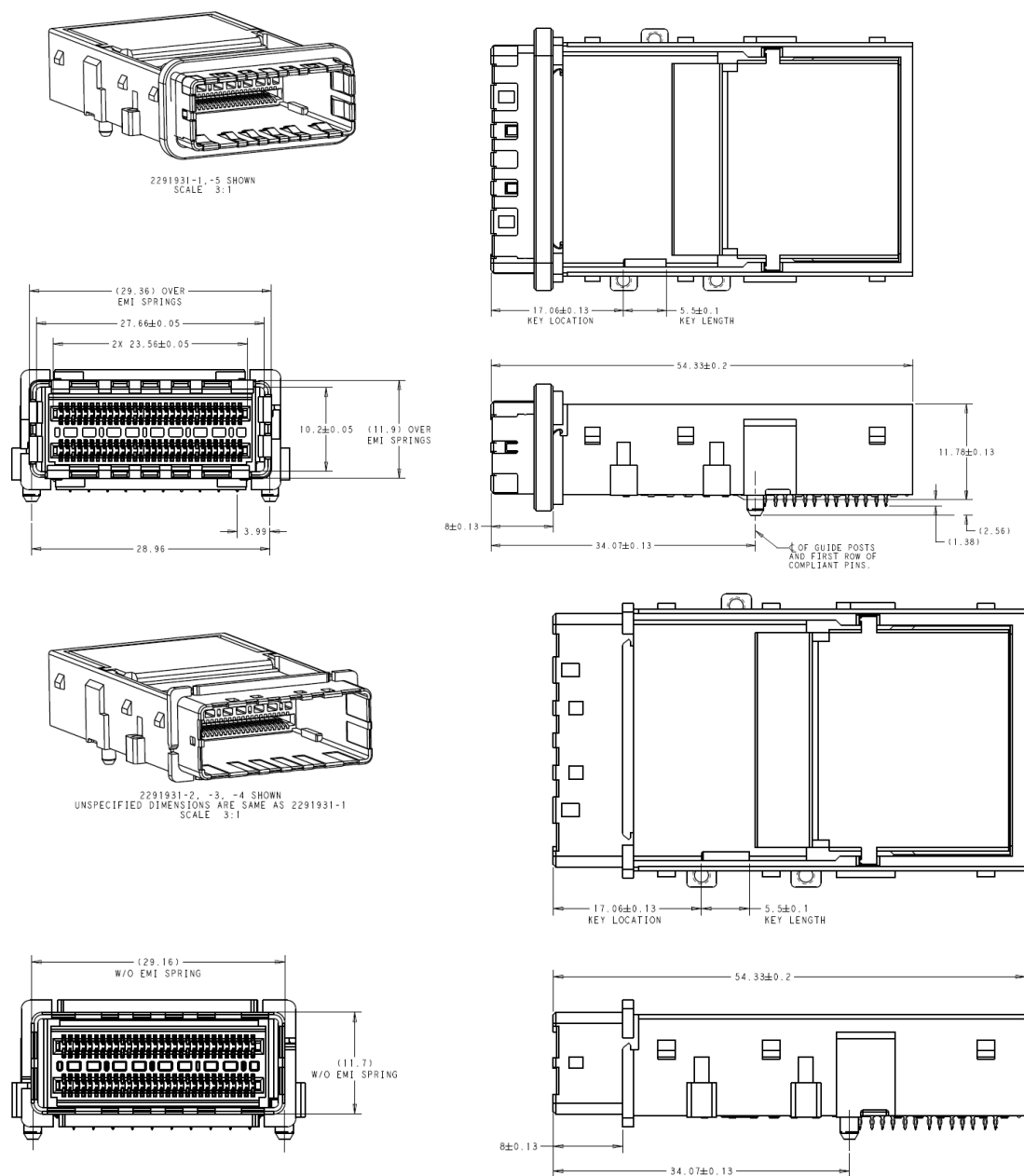
| Model                           |        | R1638E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Form Factor                     |        | Full-Height, Single Width                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Weight                          |        | 240g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Dimension                       | Length | 148mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                 | Height | 110mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Power consumption               |        | <ul style="list-style-type: none"> <li>● Idle mode (CDFP1): 4.64W</li> <li>● Idle mode (CDFP2): 8.04W</li> <li>● I/Os mode (CDFP1): 25.4W</li> <li>● I/Os mode (CDFP2): 32.98W</li> </ul> <p>Notes:<br/>           The I/Os mode power consumption is measured with the AORUS GeForce RTX™ 5070 Ti MASTER 16G GPU and RS8631D External Enclosure for CDFP1.<br/>           The I/Os mode power consumption is measured with the GeForce RTX™ 5090 GAMING OC 32G GPU and RS8631D External Enclosure for CDFP2.<br/>           Actual power consumption may differ based on system hardware and configuration.</p> |
| Power supply                    |        | PCIe: 12V(±8%), 3.3V (±8%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Work temperature                |        | +5°C ~ + 55°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Storage temperature             |        | -20°C ~ +80°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| MTBF (Mean Time Before Failure) |        | > 5,000,000 hours at 40°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

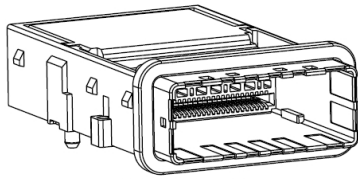
## 3. R1638E CDFP Connector

### 3.1. CDFP Connector Pin Designation

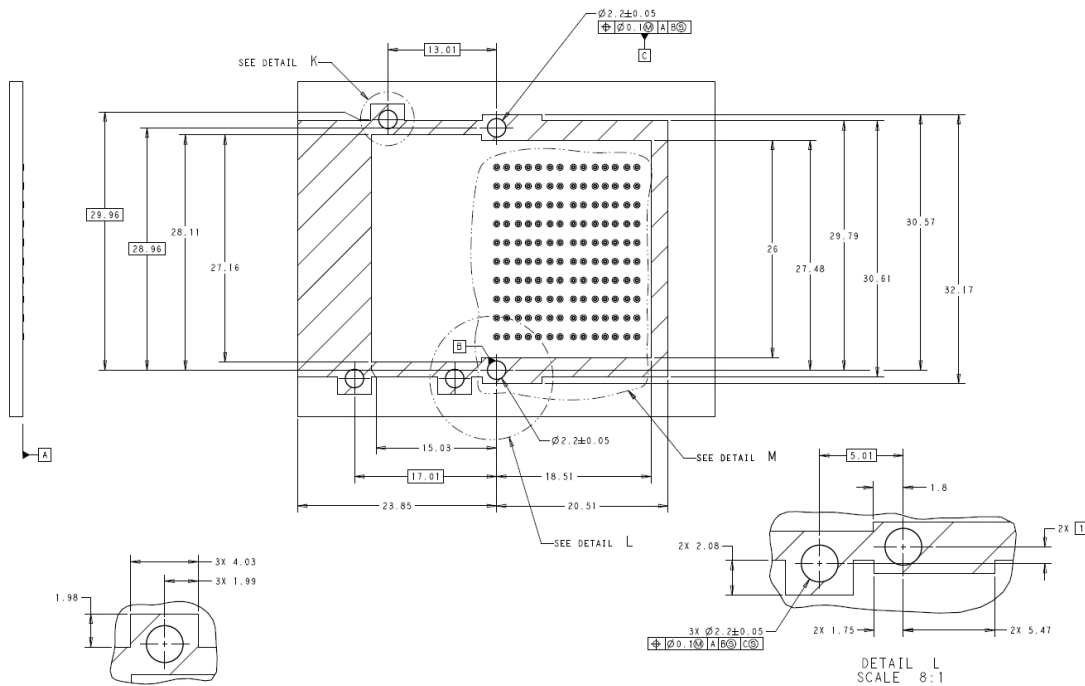
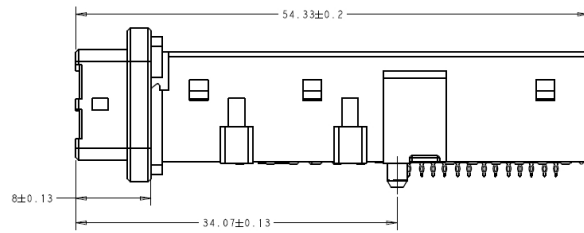
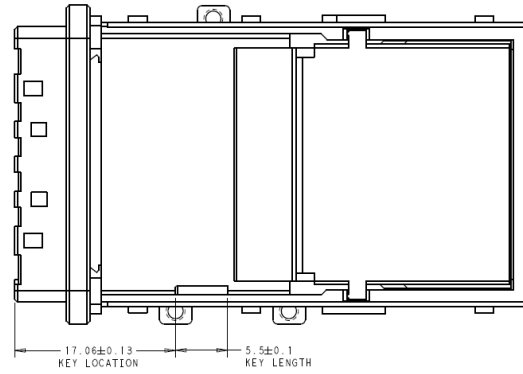
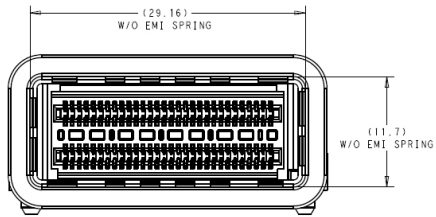
The R1638E has two CDFP connectors.

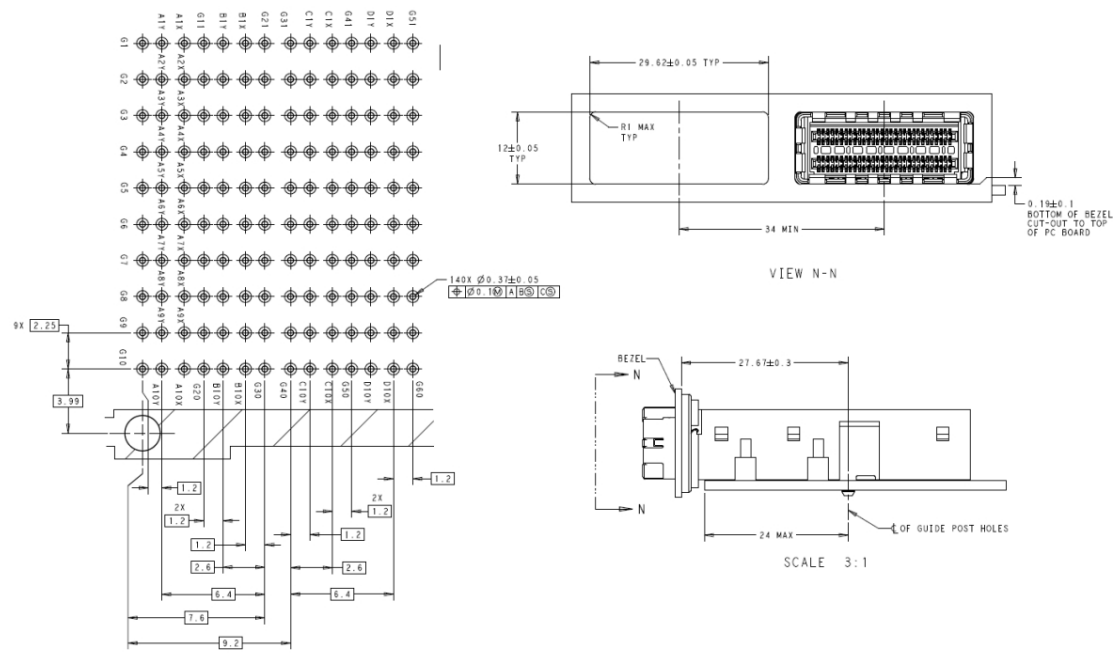
The following figure shows the connector pin designation.





2291931-6/-7 SHOWN  
UNSPECIFIED DIMENSIONS ARE SAME AS 2291931-1  
SCALE 3:1





## 3.2. CDFP Connector Pinout

The following table defines the R1638E's controller card CDFP connector pinouts.

**Table 5: Connector Pinouts**

| Pin | Name      | Pin | Name      |
|-----|-----------|-----|-----------|
| G1  | GND       | G11 | GND       |
| A1X | TX14P     | B1X | TX15P     |
| A1Y | TX14N     | B1Y | TX15N     |
| G2  | GND       | G12 | GND       |
| A2X | TX12P     | B2X | TX13P     |
| A2Y | TX12N     | B2Y | TX13N     |
| G3  | GND       | G13 | GND       |
| A3X | TX10P     | B3X | TX11P     |
| A3Y | TX10N     | B3Y | TX11N     |
| G4  | GND       | G14 | GND       |
| A4X | TX8P      | B4X | TX9P      |
| A4Y | TX8N      | B4Y | TX9N      |
| G5  | GND       | G15 | GND       |
| A5X | REF0_CLK+ | B5X | CDFP_ID_0 |
| A5Y | REF0_CLK- | B5Y | CDFP_ID_1 |
| G6  | GND       | G16 | GND       |
| A6X | TX06P     | B6X | TX7P      |
| A6Y | TX06N     | B6Y | TX7N      |
| G7  | GND       | G17 | GND       |
| A7X | TX4P      | B7X | TX5P      |
| A7Y | TX4N      | B7Y | TX5N      |
| G8  | GND       | G18 | GND       |
| A8X | TX2P      | B8X | TX3P      |
| A8Y | TX2N      | B8Y | TX3N      |

|      |          |      |          |
|------|----------|------|----------|
| G9   | GND      | G19  | GND      |
| A9X  | TX0P     | B9X  | TX1P     |
| A9Y  | TX0N     | B9Y  | TX1N     |
| G10  | GND      | G20  | GND      |
| A10X | RESET1#  | B10X | PRSENT1# |
| A10Y | GPIO0    | B10Y | PRSENT2# |
| G31  | GND      | G41  | GND      |
| C1X  | RX14P    | D1X  | RX15P    |
| C1Y  | RX14N    | D1Y  | RX15N    |
| G32  | GND      | G42  | GND      |
| C2X  | RX12P    | D2X  | RX13P    |
| C2Y  | RX12N    | D2Y  | RX13N    |
| G33  | GND      | G43  | GND      |
| C3X  | RX10P    | D3X  | RX11P    |
| C3Y  | RX10N    | D3Y  | RX11N    |
| G34  | GND      | G44  | GND      |
| C4X  | RX8P     | D4X  | RX9P     |
| C4Y  | RX8N     | D4Y  | RX9N     |
| G35  | GND      | G45  | GND      |
| C5X  | I2C0_CLK | D5X  | I2C1_CLK |
| C5Y  | I2C0_SDA | D5Y  | I2C1_SDA |
| G36  | GND      | G46  | GND      |
| C6X  | RX6P     | D6X  | RX7P     |
| C6Y  | RX6N     | D6Y  | RX7N     |
| G37  | GND      | G47  | GND      |
| C7X  | RX4P     | D7X  | RX5P     |
| C7Y  | RX4N     | D7Y  | RX5N     |
| G38  | GND      | G48  | GND      |
| C8X  | RX2P     | D8X  | RX3P     |

|      |         |      |       |
|------|---------|------|-------|
| C8Y  | RX2N    | D8Y  | RX3N  |
| G39  | GND     | G49  | GND   |
| C9X  | RX0P    | D9X  | RX1P  |
| C9Y  | RX0N    | D9Y  | RX1N  |
| G40  | GND     | G50  | GND   |
| C10X | GPIO1   | D10X | GPIO2 |
| C10Y | RESET2# | D10Y | GPIO3 |
| G21  | GND     | G51  | GND   |
| G22  | GND     | G52  | GND   |
| G23  | GND     | G53  | GND   |
| G24  | GND     | G54  | GND   |
| G25  | GND     | G55  | GND   |
| G26  | GND     | G56  | GND   |
| G27  | GND     | G57  | GND   |
| G28  | GND     | G58  | GND   |
| G29  | GND     | G59  | GND   |
| G30  | GND     | G60  | GND   |

## 4. Accessory

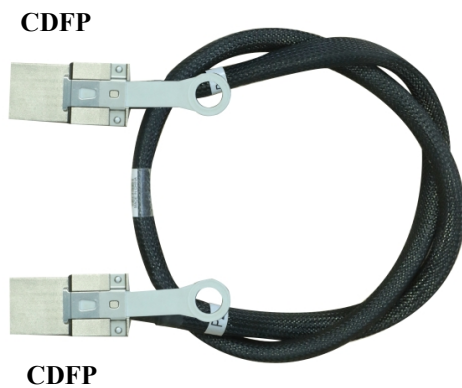
The R1638E offers a variety of flexible cabling options, connecting to the Enclosure through the CDFP connector.

The following sections indicate the cable pinout and connection diagram for supported cable accessory and supported Enclosure.

### 4.1. CDFP-CDFP-1M Gen5 (Cooprlink) Cable

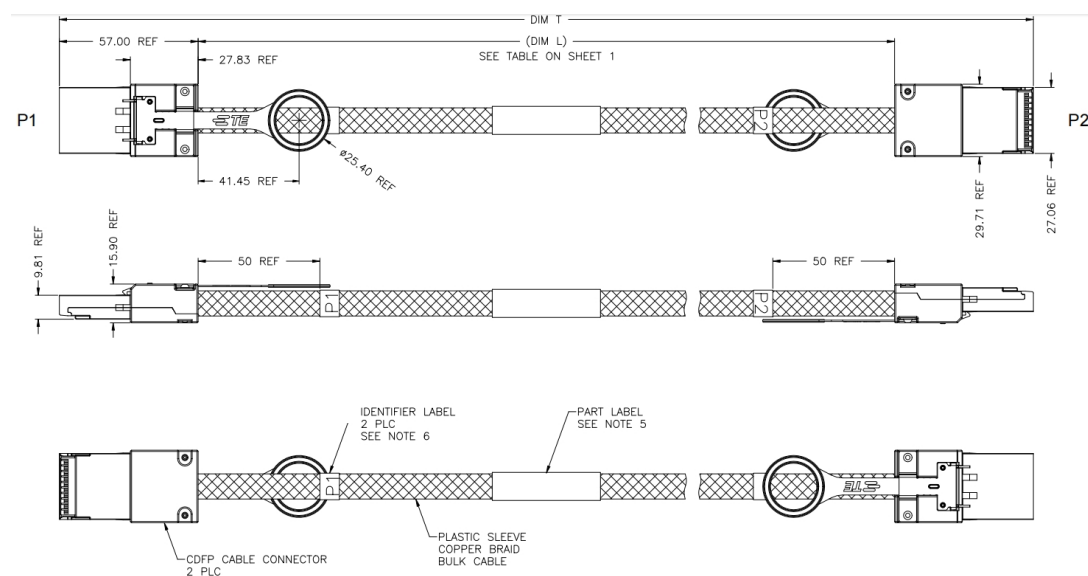
CDFP Host to CDFP Device cable. Length 1M.

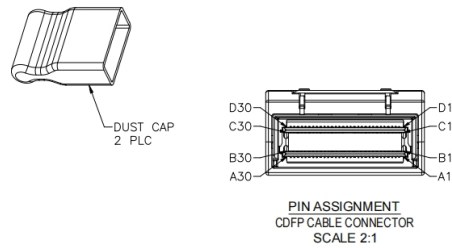
#### 4.1.1. Cable Diagram



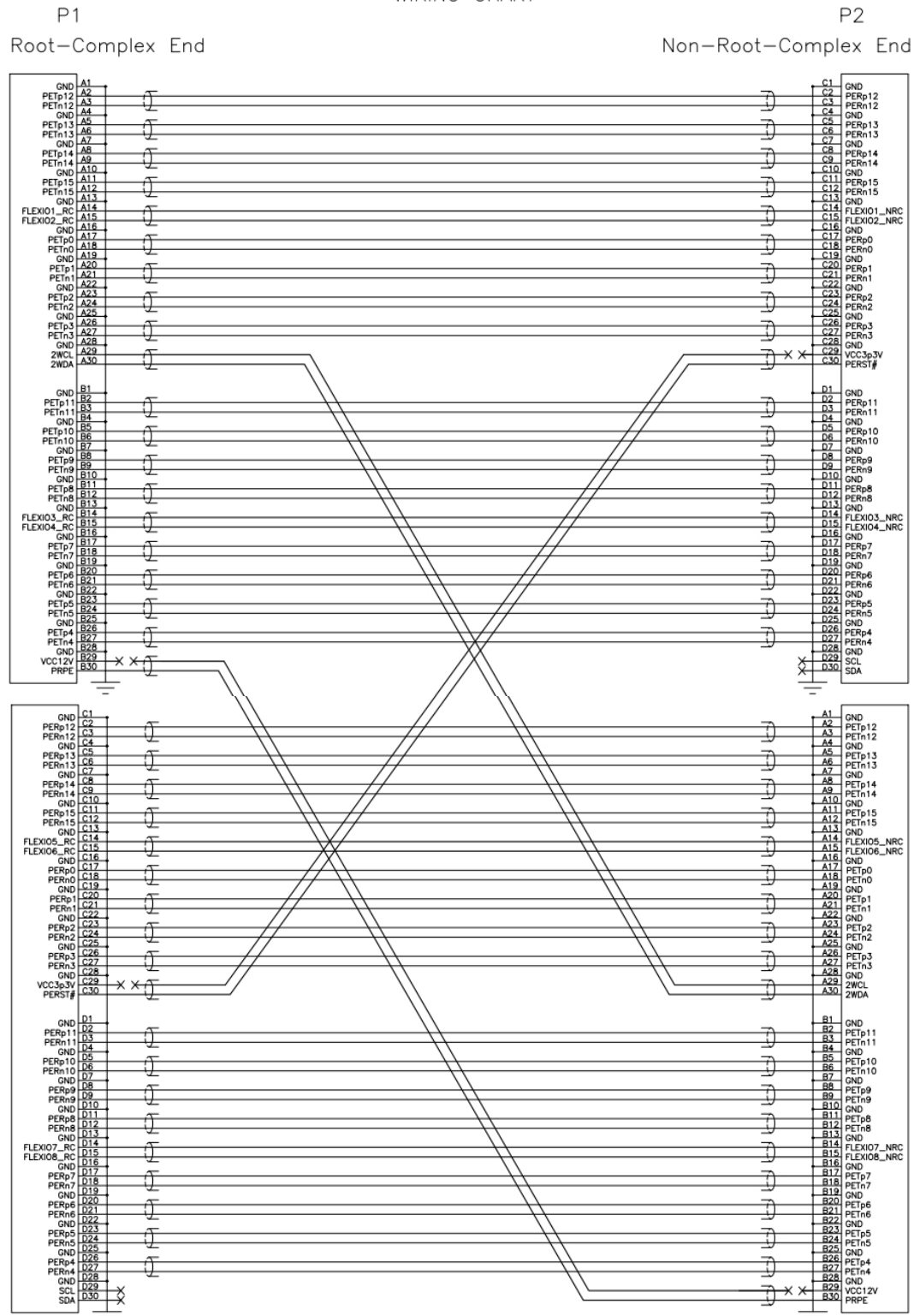
#### 4.1.2. Cable Drawings and Pinouts

The following figure shows the pinout for the HighPoint CDFP-CDFP-1M Gen5 (Cooprlink) cable, one x8 CDFP to one x8 CDFP connection.





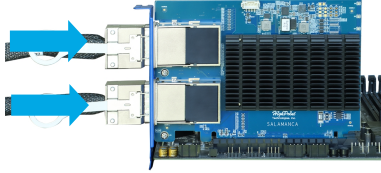
## WIRING CHART



### 4.1.3. Cable Connection

The following steps show the connection of a Enclosure to the R1638E using the CDFP-CDFP-1M Gen5 (Cooplink) cable.

1. Connect the CDFP cables to the R1638E's CDFP ports.



2. Connect the CDFP cables to the Enclosure's CDFP ports and the UL power cords to the Enclosure for AC power connection.



## 4.2. RS8631D External Enclosure Device

The Enclosure is designed specifically for Gen5 (PCIe 5.0) GPU (Graphics Processing Unit).

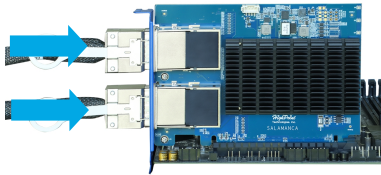
### 4.2.1. Enclosure View



### 4.2.2. Enclosure Connection

The following steps show the connection of the RS8631D to the R1638E using the CDFP-CDFP-1M Gen5 (Cooplink) cable.

1. Connect the CDFP cables to the R1638E's CDFP ports.



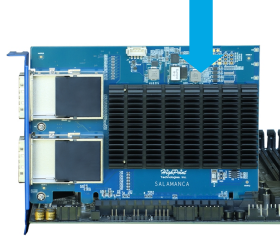
2. Connect the CDFP cables to the Enclosure's CDFP ports and the UL power cords to the Enclosure for AC power connection.



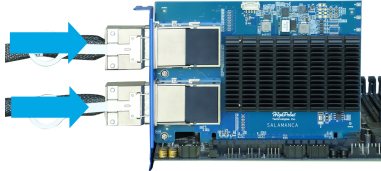
## 5. R1638E Installation Instructions

The R1638E provides two CDFP connectors compatible with HighPoint's certified cable accessory and Enclosure. The following steps show how to connect the Enclosure directly to the R1638E.

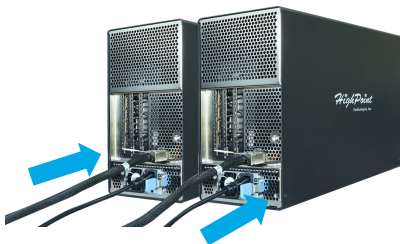
1. Use a wired ESD wrist strap that is properly grounded.
2. Unpack and remove the R1638E and check it for damage. If it appears damaged, please get in touch with HighPoint Technical Support.
3. Shut down the system and disconnect the AC power cord.
4. Press down gently but firmly to seat the R1638E correctly in the available slot.



5. Connect the CDFP cables to the R1638E's CDFP ports.



6. Connect the CDFP cables to the Enclosure's CDFP ports and the UL power cords to the Enclosure for AC power connection.



7. Power up the Enclosures, then power up the motherboard.
  8. Turn on the power to the system.
- Note:** When powering off the system, the Enclosure must be powered off at the same time.

## **6. Revision History**

### **6.1. Version 1.00, August 24, 2026**

Initial version.