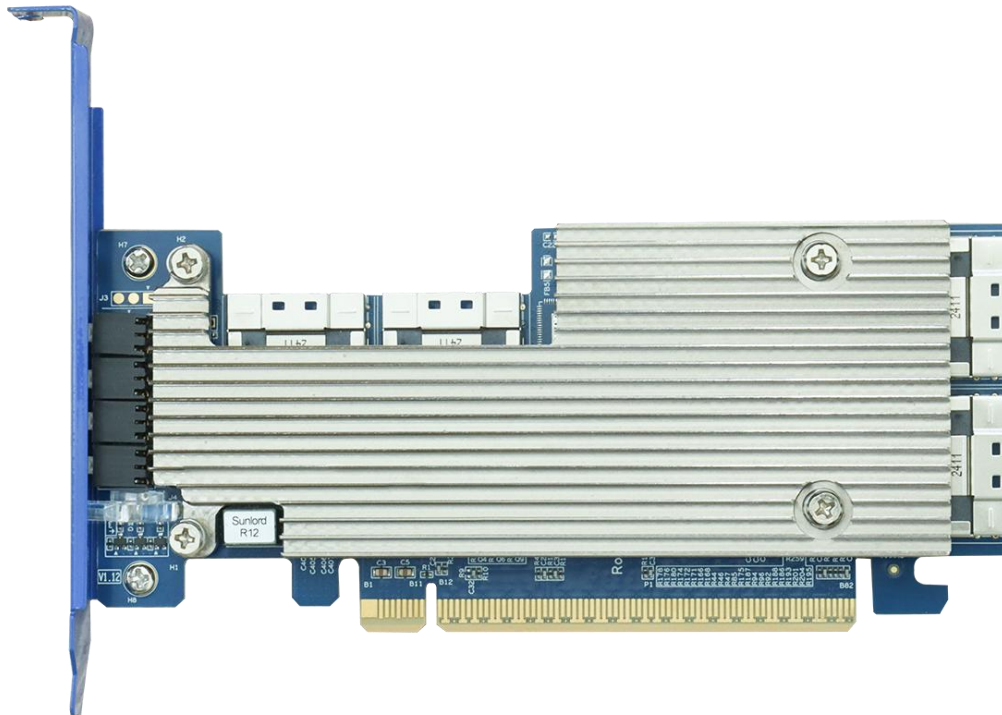# Rockket 1528D (R1528D)

NVMe Switch Adapter User Guide

V1.03 - June 23, 2025

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1. Overview

The R1528D is the latest member of our PCIe Gen4 NVMe Switch Adapter product family.

HighPoint Rocket Series NVMe connectivity adapters address the needs of solution providers and system integrators that cater to vertical marketplaces for high-speed industrial, corporate, and media applications. They were designed for professional applications that demand uncompromised storage performance, scalability, and adaptability in a compact, easy-to-integrate package that is universally compatible with industry-standard x86-64 (Intel/AMD) platforms.

The R1528D's eight independent device ports can support U.2/U.3 NVMe SSDs via versatile cabling solutions.

All major Windows operating systems and current distributions of Linux natively support the R1528D. You won't need to juggle a series of device drivers, install a complex software suite, or master a specialized management interface. Your NVMe SSDs will be automatically recognized and can be prepped and mounted using the operating system's standard tool set.

1.1. Key Features

- Dedicated PCIe 4.0 x16 host interface

- Support data transfer rate 32GB/s

- Provide four internal SlimSAS (SFF-8654 x8) connectors

- Support eight dedicated U.2/U.3 NVMe devices

- Complies with SFF-9402 standard

- Provide a full-height bracket and a low-profile bracket

- True NVMe Hot-Plug & Hot-Swap capability

- FRU Inventory support

- Downstream port containment

- Read tracking

- Synthetic hierarchy

- Software Secure Boot

- Out-Of-band Support - BMC Support

- Complies with SFF-TA-1005 specification for Universal Backplane Management (UBM)

- Support VPP Backplane

- Support LED Management

- Support all the operating systems with a native NVMe driver

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 provided as an extension to the Vendor ID (or Subsystem Vendor ID) in the Configuration Space header. This 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. V0 indicates the Vendor Name V1 indicates the Main Chip

1.1.2. Synthetic Hierarchy

A synthetic hierarchy can be created to isolate the host from these physical PCIe topology changes and errors.

2. R1528D Hardware Description

2.1. R1528D Layout

The layout of the R1528D is presented in two parts.

2.1.1. Front View

The following figure shows the key components of the R1528D.

① ② ③   ④   ⑤   ⑥

⑦   ⑧
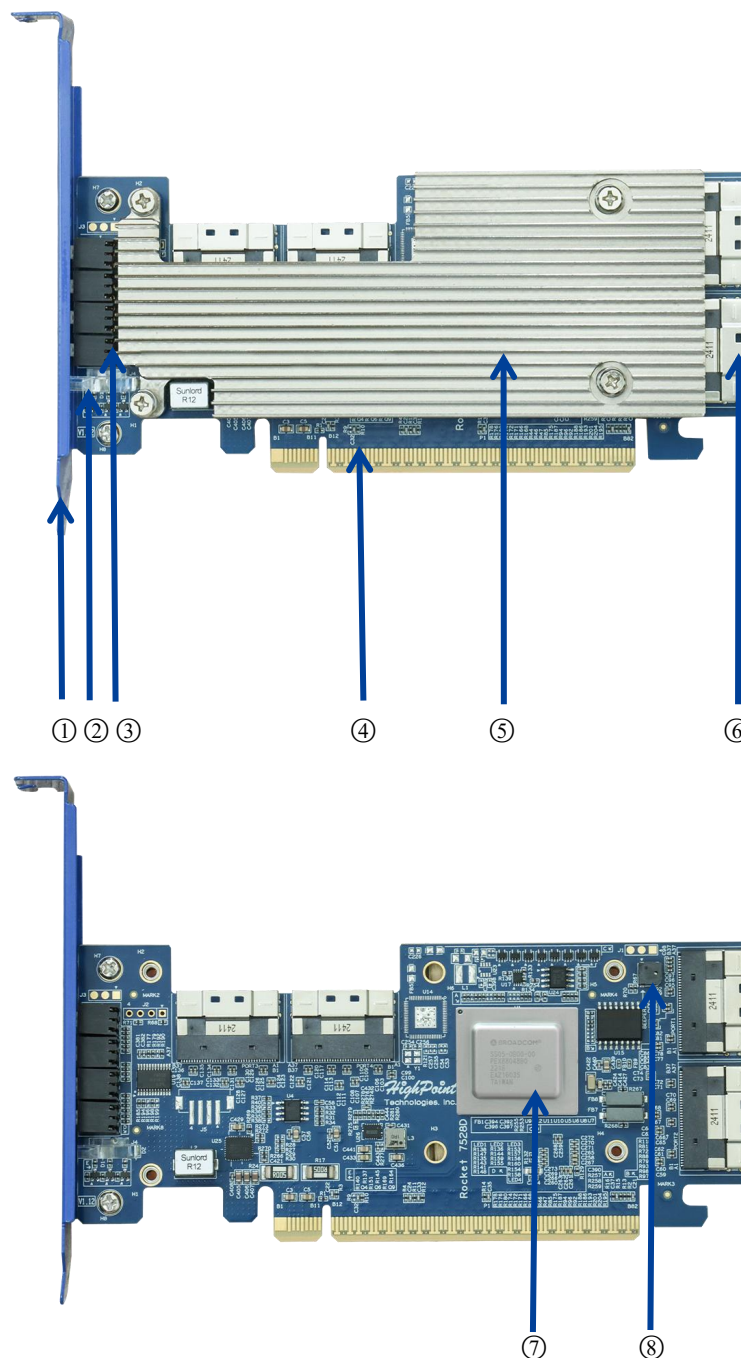
The following table describes the key components of the R1528D.

Table 2: Key component of the R1528D

Number	Type	Description
①	Bracket	Full-height bracket (optional low-profile bracket included). The R1528D is secured to the chassis by a bracket.
②	RGB	Status LED and Fault LED. ● Status LED -- The state of R1528D PCIe bandwidth. ● Fault LED -- The state of the Broadcom chipset temperature.
③	LED	Eight SSD LED. SSD LED indicates the state of SSD bandwidth.
④	PCIe Host Interface	PCIe 4.0 x16 host interface. The interface between the R1528D and the host system. With the PCIe interface, this connector provides power to the board.
⑤	Cooling System	Passive Heatsink. Used to dissipate heat from electronic components prone to heat generation.
⑥	Storage Interface	Four internal SFF-8654 connectors. Connect the R1528D by cable to the storage devices.
⑦	Chip	Broadcom PEX 88048 chip.
⑧	Beeper	Only to be used for field testing.

2.1.2. Diagnostic LED View

The following figure shows the LED Indicators of the R1528D.
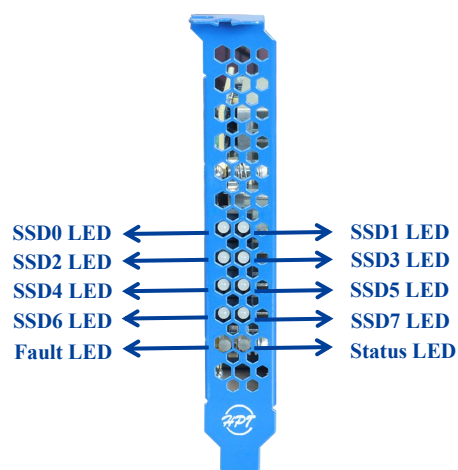
The following table describes the SSD LED, Status LED, and Fault LED of the R1528D.

Table 3: Description of LED

LED	Color	Status	Description
SSD LED		**OFF**	The R1528D is powered off, or the SSD is not detected.
		Solid Green	The SSD is detected.
		Solid Red	The SSD has failed.
Status LED		**OFF**	The R1528D is powered off.
	Notes: The LED blinks blue twice in the first second, then goes out for one second and continues to cycle this process. The following represents the bandwidth status of the R1528D.		
		Interval Flash Green	PCIe 4.0 x16.
		Interval Flash Yellow	PCIe 4.0 x8 or PCIe 3.0 x16.
		Interval Flash Cyan	PCIe 4.0 x4 or PCIe 3.0 x8.
		Interval Flash White	PCIe 3.0 x4.
		Interval Flash Red	Not appear as above.
Fault LED		**OFF**	The R1528D is powered off.
		Fast Flash Red	The LED blinks red at 4 Hz to indicate that the Broadcom chipset temperature has exceeded the recommended temperature threshold (105℃).

2.2. PCIe Host Interface

The R1528D's PCIe 4.0 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 32GB/s

2.3. Storage Interface

The R1528D has four SFF-8654 interfaces. Other storage interface features include the following:

- Dedicated PCIe 4.0 x4 per port

- Supports up to eight NVMe devices (up to x4 lanes, U.2/U.3 media)

- Data transfer at 8GB/s

2.4. Basic Specifications

The following table describes the basic specifications of the R1528D.

Table 4: Basic Specifications of R1528D

Model		R1528D
Form Factor		LP-MD2, Single Width
Weight		340g
Dimension	Length	6.10"
	Height	2.71"
Power consumption		29.58W
Power supply		PCIe: 12V, 3.3V
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. R1528D SFF-8654 Connector

3.1. SFF-8654 Connector Pin Designation

The R1528D has four x8 SFF-8654 connectors, designated as A and B. It follows the SFF-9402 standard for connector sideband signal assignments.

The following figure shows the SFF-8654 connector pin designation.
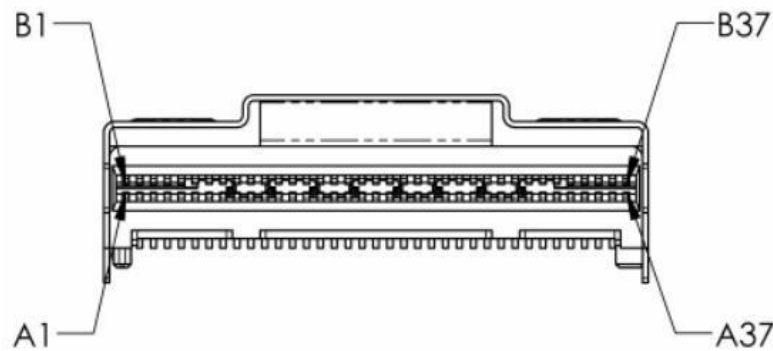
3.2. SFF-8654 Connetor Pinout

The following table defines the R1528D's SFF-8654 connector pinouts.

Table 5: SFF-8654 Connetor Pinouts

Pin	Name	Pin	Name
A1	GND	B1	GND
A2	PERp0	B2	PETp0
A3	PERn0	B3	PETn0
A4	GND	B4	GND
A5	PERp1	B5	PETp1
A6	PERn1	B6	PETn1
A7	GND	B7	GND
A8	NC	B8	U0_SCL
A9	NC	B9	U0_SDA
A10	GND	B10	GND
A11	SFF8654_LCK1_P	B11	PE_RESET#
A12	SFF8654_LCK1_N	B12	U0_CWAKE#

A13	GND	B13	GND
A14	PERp2	B14	PETp2
A15	PERn2	B15	PETn2
A16	GND	B16	GND
A17	PERp3	B17	PETp3
A18	PERn3	B18	PETn3
A19	GND	B19	GND
A20	PERp4	B20	PETp4
A21	PERn4	B21	PETn4
A22	GND	B22	GND
A23	PERp5	B23	PETp5
A24	PERn5	B24	PETn5
A25	GND	B25	GND
A26	NC	B26	U1_SCL
A27	NC	B27	U1_SDA
A28	GND	B28	GND
A29	SFF8654_LCK2_P	B29	PE_RESET#
A30	SFF8654_LCK2_N	B30	U1_CWAKE#
A31	GND	B31	GND
A32	PERp6	B32	PETp6
A33	PERn6	B33	PETn6
A34	GND	B34	GND
A35	PERp7	B35	PETp7
A36	PERn7	B36	PETn7
A37	GND	B37	GND

3.3. Backplane Connector Support

The R1528D supports the industry-standard SFF-TA-1005 Specification for Universal Backplane Management (UBM). UBM provides the following key features:

- Reports the backplane capabilities, including the following:

  - NVMe drive widths

  - Maximum speeds

  - Dual-port support

  - Support for drive power enable and disable (PWDIS)

- Supports cable order independence

  - Disk LED control and slot ID are not dependent on cable order

- Enables disk hot-plug insertion

3.3.1. UBM Backplane

The SFF-TA-1005 (UBM) standard-compliant backplanes are designed to transmit slot numbers to the R1528D automatically. This innovation eliminates the need to manually configure cables between the R1528D and the backplane connector, optimizing cable flexibility.

3.3.1.1. UBM Backplane with x8 Connectors

The following figures show a backplane using x8 connectors with one UBM target per connector. The red lines indicate the I_2C bus connections. For the backplane LEDs to function properly and the disks to be recognized properly, it is imperative that the backplane connects the I_2C connection of the UBM target to the specific x8 SFF-8654 connector. To ascertain which host-facing connector corresponds to a specific slot, please refer to the backplane's documentation.

Note: In order to recognize the disk correctly, please connect all the required cables before use.

Prioritize the power supply to the backplane and disks, then to the host, or supply power simultaneously.

Figure 1 UBM Backplane with x8 Connectors (8 Disks)
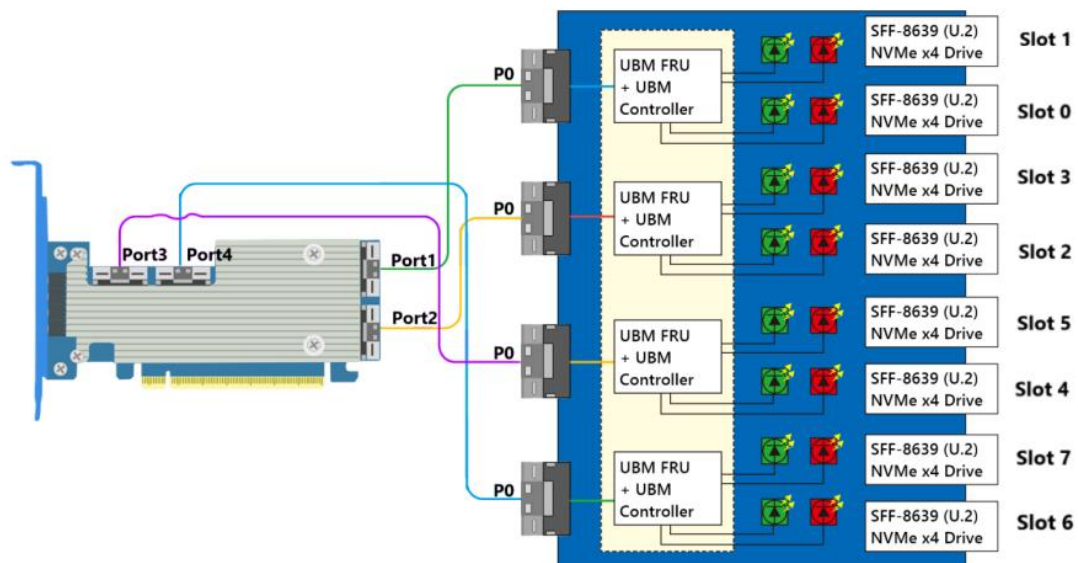
Figure 2 UBM Backplane with x8 Connectors (32 Disks)
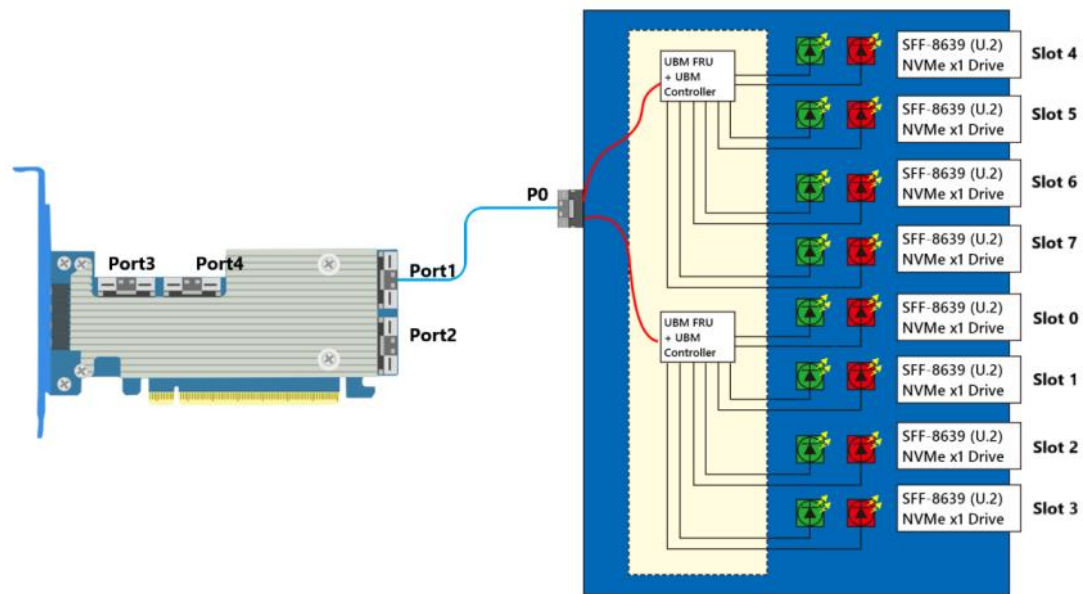
Note: For the connection of Port2, 3, and 4, please refer to Port1.

3.3.1.2. UBM Backplane with x4 Connectors

The following figures show a backplane using x4 connectors with one UBM target per connector. The red lines indicate the I$_2$C bus connections. Or the backplane LEDs to function properly and the disks to be recognized properly, it is imperative that the backplane connects the I$_2$C connection of the UBM target to the specific x4 SFF-8654 connector. To ascertain which host-facing connector corresponds to a specific slot, please refer to the backplane's documentation.

Note: In order to recognize the disk correctly, please connect all the required cables before use.

Prioritize the power supply to the backplane and disks, then to the host, or supply power simultaneously.

Figure 3 UBM Backplane with x4 Connectors (8 Disks)
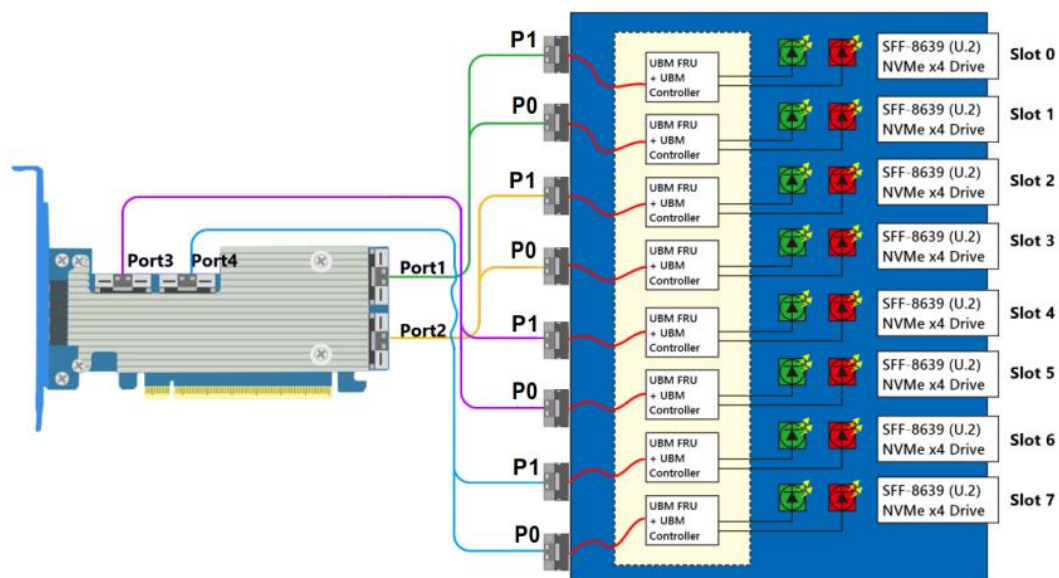
Figure 4 UBM Backplane with x4 Connectors (32 Disks)
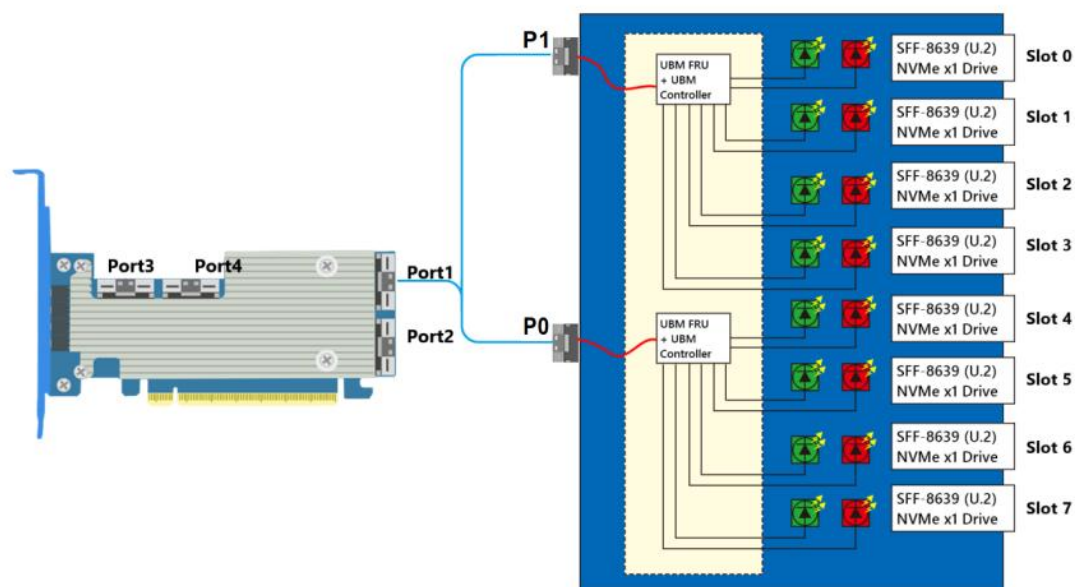
Note: For the connection of Port2, 3, and 4, please refer to Port1.

3.3.1.3. UBM Backplane Connection (8 Disks)

The following steps show the connection of the UBM backplane to the R1528D.

1. Connect the disks to the backplane.

2. Connect the cable connector to the backplane.
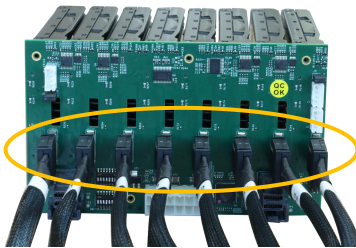
3. Connect the SFF-8654 connector to the R1528D.
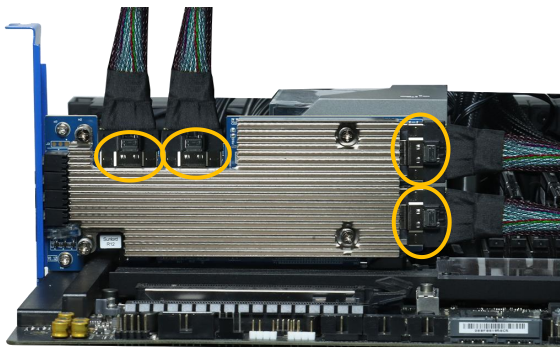
3.3.1.4. UBM Backplane Connection (32 Disks)

The following steps show the connection of the UBM backplane to the R1528D.

1. Connect the disks to the backplane.

2. Connect the cable connector to the backplane.
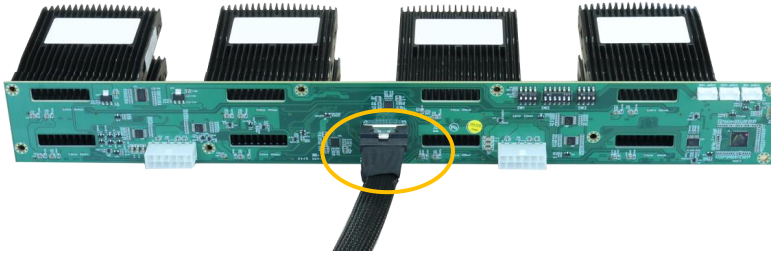
3. Connect the SFF-8654 connector to the R1528D.
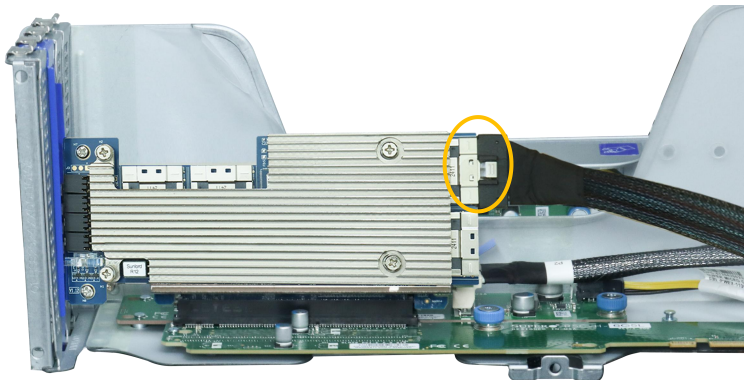
3.3.2. VPP Backplane

The R1528D supports the legacy implementation of Virtual Pin Port (VPP) backplane management. The cables must be connected according to the desired slot enumeration to identify the slots correctly. Connect the SFF-8654 connector of the R1528D to the backplane via the cable.

3.3.2.1. Backplane with x8 Connectors and VPP

The figures below illustrate the anticipated connections to a backplane, utilizing x8 SFF-8654 connectors from the Adapter to NVMe disks, with VPP over I_2C employed for managing the backplane. The red line highlights the I_2C bus connection. Or the backplane LEDs to function properly and the disks to be recognized properly, it is imperative that the backplane connects the I_2C connection of the VPP target to the specific x8 SFF-8654 connector. To ascertain which host-facing connector corresponds to a specific slot, please refer to the backplane's documentation.

Note: In order to recognize the disk correctly, please connect all the required cables before use.

Prioritize the power supply to the backplane and disks, then to the host, or supply power simultaneously.

Figure 5 Backplane with x8 Connectors and VPP (8 Disks)
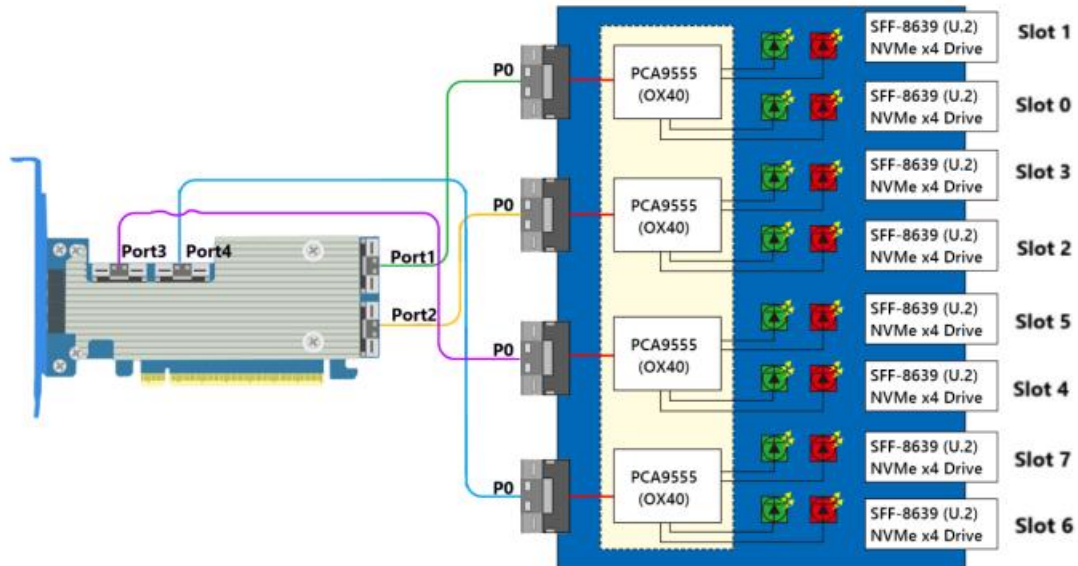
3.3.2.2. Backplane with x4 Connectors and VPP

The figure below illustrates the anticipated connections to a backplane, utilizing x4 SFF-8654 connectors from the Adapter to NVMe disks, with VPP over I$_2$C employed for managing the backplane. The red line highlights the I$_2$C bus connection. or the backplane LEDs to function properly and the disks to be recognized properly, when using HighPoint supplied cables, connect the P0 labeled leg of the cable to the PCA9555 target. To ascertain which host-facing connector corresponds to a specific slot, please refer to the backplane's documentation.

Note: In order to recognize the disk correctly, please connect all the required cables before use.

Prioritize the power supply to the backplane and disks, then to the host, or supply power simultaneously.

Figure 6 Backplane with x4 Connectors and VPP (8 Disks)
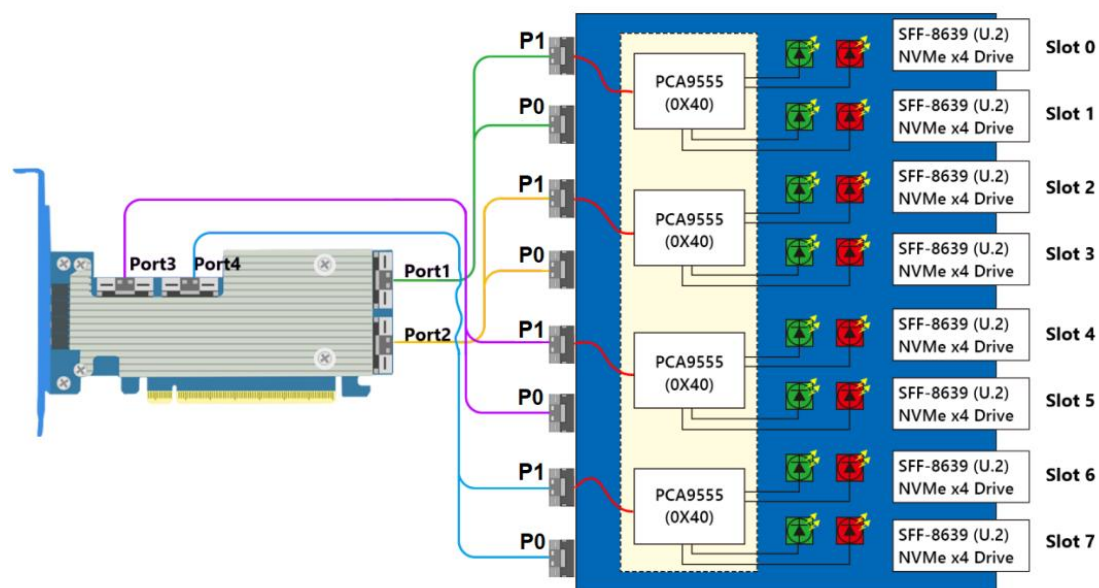
4. Cable Accessories

A wide selection of flexible cabling options is available for the R1528D, which enable the R1528D to mix configurations of U.2/U.3 NVMe SSDs via SFF-8639, SFF-8643, SFF-8654, SFF-8611, and MCIO connectors.

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

4.1. TS8i-8639-060

SFF-8654 Host to U.2 SFF-8639 Device cable with a 15-pin SATA power connector. Each cable supports two U.2 NVMe SSDs. Length 0.6M.

4.1.1. Cable Diagram

SFF-8654

SFF-8639

4.1.2. Cable Drawings and Pinouts

The following figure shows the pinout for the HighPoint TS8i-8639-060 cable, one x8 SFF-8654 to two x4 SFF-8639 connection.

⚠ WIRING TABLE

PA		P0			PA		P1	
GROUND	A1	E9	GROUND		GROUND	A19	E9	GROUND
PERp0	A2	E14	PERp0		PERp4	A20	E14	PERp0
PERn0	A3	E13	PERn0		PERn4	A21	E13	PERn0
GROUND	A4	E12/S16	GROUND		GROUND	A22	E12/S16	GROUND
PERp1	A5	S21	PERp1		PERp5	A23	S21	PERp1
PERn1	A6	S20	PERn1		PERn5	A24	S20	PERn1
GROUND	A7	S19	GROUND		GROUND	A25	S19	GROUND
BP_TYPEA(SB7)	A8	N/C			BP_TYPEB(SB7)	A26	N/C	
2W_RSTA#(SB4)	A9	N/C			2W_RSTB#(SB4)	A27	N/C	
SB3	A10	N/C			SB3	A28	N/C	
REFCLKA+	A11	E7	REFCLK+		REFCLKB+	A29	E7	REFCLK+
REFCLKA-	A12	E8	REFCLK-		REFCLKB-	A30	E8	REFCLK-
GROUND	A13	E9/S22	GROUND		GROUND	A31	E9/S22	GROUND
PERp2	A14	S27	PERp2		PERp6	A32	S27	PERp2
PERn2	A15	S26	PERn2		PERn6	A33	S26	PERn2
GROUND	A16	S25/E16	GROUND		GROUND	A34	S25/E16	GROUND
PERp3	A17	E21	PERp3		PERp7	A35	E21	PERp3
PERn3	A18	E20	PERn3		PERn7	A36	E20	PERn3
GROUND	A19	E19	GROUND		GROUND	A37	E19	GROUND
GROUND	B1	E15	GROUND		GROUND	B19	E15	GROUND
PETp0	B2	E10	PETp0		PETp4	B20	E10	PETp0
PETn0	B3	E11	PETn0		PETn4	B21	E11	PETn0
GROUND	B4	E12/S22	GROUND		GROUND	B22	E12/S22	GROUND
PETp1	B5	S17	PETp1		PETp5	B23	S17	PETp1
PETn1	B6	S18	PETn1		PETn5	B24	S18	PETn1
GROUND	B7	S19	GROUND		GROUND	B25	S19	GROUND
2W-CLKA(SB0)	B8	E23	SMB_CLK		2W-CLKB(SB0)	B26	E23	SMB_CLK
2W-SDAA(SB1)	B9	E24	SMB_DAT		2W-SDAB(SB1)	B27	E24	SMB_DAT
SB2	B10	N/C E25 N/C			SB2	B28	N/C E25 N/C	
PERSTA#(SB5)	B11	E5	PERST#		PERSTB#(SB5)	B29	E5	PERST#
CPRSNTA(SB6)	B12	P10	PRSNT#		CPRSNTB(SB6)	B30	P10	PRSNT#
GROUND	B13	S28	GROUND		GROUND	B31	S28	GROUND
PETp2	B14	S23	PETp2		PETp6	B32	S23	PETp2
PETn2	B15	S24	PETn2		PETn6	B33	S24	PETn2
GROUND	B16	S25/E22	GROUND		GROUND	B34	S25/E22	GROUND
PETp3	B17	E17	PETp3		PETp7	B35	E17	PETp3
PETn3	B18	E18	PETn3		PETn7	B36	E18	PETn3
GROUND	B19	E19	GROUND		GROUND	B37	E19	GROUND

P1 / P3

P1				P3	
3.3V	E3	ORANGE(26AWG) NC		1	3.3V
3.3V	P1	NC		2	3.3V
3.3V	P2	NC		3	3.3VPre
3.3VPre	P3	NC		4	GND
GND	P4	BLACK(18AWG)		5	GND
GND	P5			6	GND
GND	P6			7	5VPre
5VPre	P7	RED(18AWG)		8	5V
5V	P8			9	5V
5V	P9			10	GND
GND	P11	BLACK(24AWG)		11	GND
GND	P12			12	GND
12VPre	P13	YELLOW(18AWG)		13	12VPre
12V	P14			14	12V
12V	P15			15	12V
	KEY				

P0 / P2

P0				P2	
3.3V	E3	ORANGE(26AWG) NC		1	3.3V
3.3V	P1	NC		2	3.3V
3.3V	P2	NC		3	3.3VPre
3.3VPre	P3	NC		4	GND
GND	P4	BLACK(18AWG)		5	GND
GND	P5			6	GND
GND	P6			7	5VPre
5VPre	P7	RED(18AWG)		8	5V
5V	P8			9	5V
5V	P9			10	GND
GND	P11	BLACK(24AWG)		11	GND
GND	P12			12	GND
12VPre	P13	YELLOW(18AWG)		13	12VPre
12V	P14			14	12V
12V	P15			15	12V
	KEY				

4.1.3. Cable Connection

The following steps show the connection of a U.2 SSD to the R1528D using the TS8i-8639-060 cable.

1. Connect the SFF-8639 connector of the TS8i-8639-060 cable to the NVMe SSD, and connect the 15-pin SATA power connector of the TS8i-8639-060 cable to the system power supply.

SFF-8639

15-pin SATA power connector

2. Connect the SFF-8654 connector of the TS8i-8639-060 cable to the R1528D.

4.2. 8654-8654-110

SFF-8654 Host to SFF-8654 Device cable. Each cable can host up to two NVMe SSDs. Length 1M.

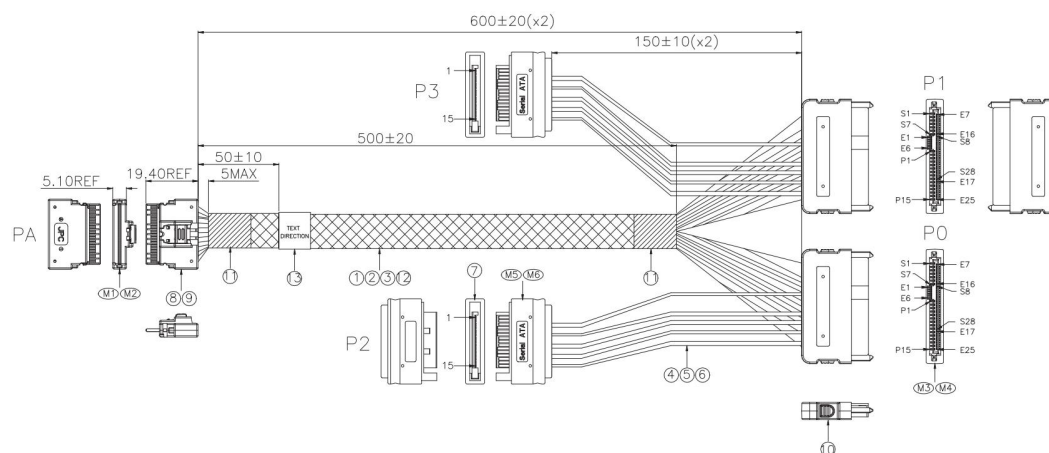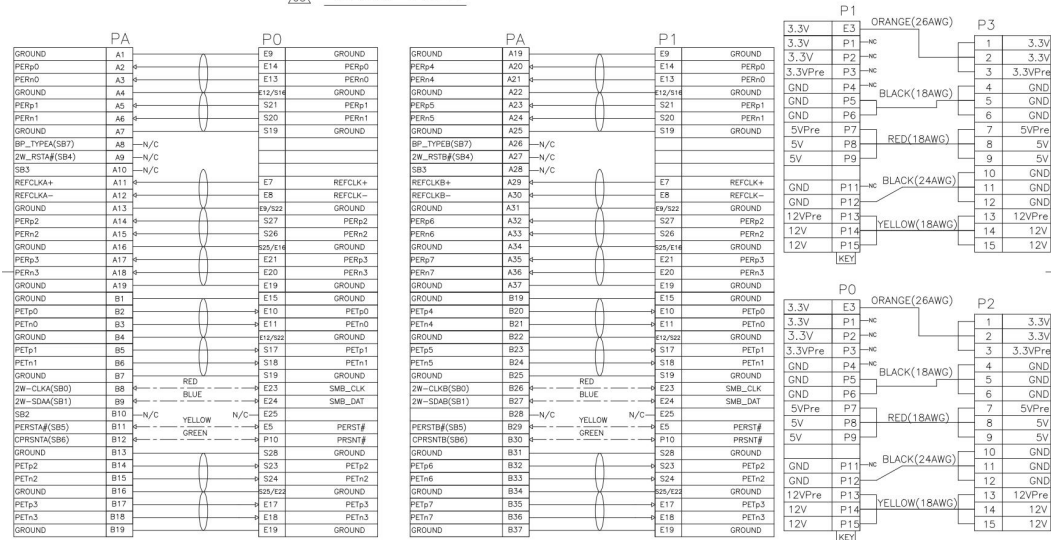### 4.2.1. Cable Diagram

SFF-8654   **SFF-8654**

4.2.2. Cable Drawings and Pinouts

The following figure shows the pinout for the HighPoint 8654-8654-110 cable, one x8 SFF-8654 to one x8 SFF-8654 connection.
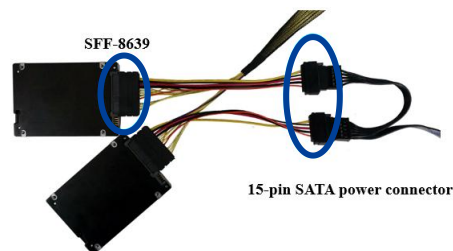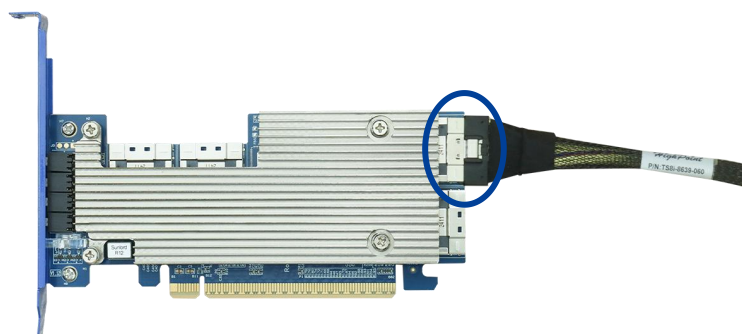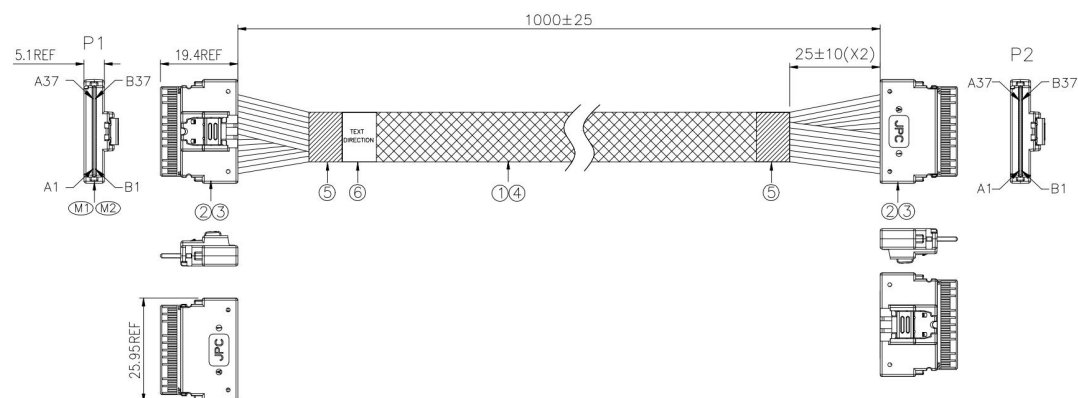
WIRING TABLE

P1		P2		P1		P2	
GROUND	B37	A37	GROUND	GROUND	A37	B37	GROUND
TX7−	B36	A36	RX7−	RX7−	A36	B36	TX7−
TX7+	B35	A35	RX7+	RX7+	A35	B35	TX7+
GROUND	B34	A34	GROUND	GROUND	A34	B34	GROUND
TX6−	B33	A33	RX6−	RX6−	A33	B33	TX6−
TX6+	B32	A32	RX6+	RX6+	A32	B32	TX6+
GROUND	B31	A31	GROUND	GROUND	A31	B31	GROUND
SIDEBAND	B30	A30	SIDEBAND	SIDEBAND	A30	B30	SIDEBAND
SIDEBAND	B29	A29	SIDEBAND	SIDEBAND	A29	B29	SIDEBAND
GROUND	B28	A28	GROUND	GROUND	A28	B28	GROUND
SIDEBAND	B27	A27	SIDEBAND	SIDEBAND	A27	B27	SIDEBAND
SIDEBAND	B26	A26	SIDEBAND	SIDEBAND	A26	B26	SIDEBAND
GROUND	B25	A25	GROUND	GROUND	A25	B25	GROUND
TX5−	B24	A24	RX5−	RX5−	A24	B24	TX5−
TX5+	B23	A23	RX5+	RX5+	A23	B23	TX5+
GROUND	B22	A22	GROUND	GROUND	A22	B22	GROUND
TX4−	B21	A21	RX4−	RX4−	A21	B21	TX4−
TX4+	B20	A20	RX4+	RX4+	A20	B20	TX4+
GROUND	B19	A19	GROUND	GROUND	A19	B19	GROUND
TX3−	B18	A18	RX3−	RX3−	A18	B18	TX3−
TX3+	B17	A17	RX3+	RX3+	A17	B17	TX3+
GROUND	B16	A16	GROUND	GROUND	A16	B16	GROUND
TX2−	B15	A15	RX2−	RX2−	A15	B15	TX2−
TX2+	B14	A14	RX2+	RX2+	A14	B14	TX2+
GROUND	B13	A13	GROUND	GROUND	A13	B13	GROUND
SIDEBAND	B12	A12	SIDEBAND	SIDEBAND	A12	B12	SIDEBAND
SIDEBAND	B11	A11	SIDEBAND	SIDEBAND	A11	B11	SIDEBAND
GROUND	B10	A10	GROUND	GROUND	A10	B10	GROUND
SIDEBAND	B9	A9	SIDEBAND	SIDEBAND	A9	B9	SIDEBAND
SIDEBAND	B8	A8	SIDEBAND	SIDEBAND	A8	B8	SIDEBAND
GROUND	B7	A7	GROUND	GROUND	A7	B7	GROUND
TX1−	B6	A6	RX1−	RX1−	A6	B6	TX1−
TX1+	B5	A5	RX1+	RX1+	A5	B5	TX1+
GROUND	B4	A4	GROUND	GROUND	A4	B4	GROUND
TX0−	B3	A3	RX0−	RX0−	A3	B3	TX0−
TX0+	B2	A2	RX0+	RX0+	A2	B2	TX0+
GROUND	B1	A1	GROUND	GROUND	A1	B1	GROUND

4.2.3. Cable Connection

The following steps show the connection of the backplane to the R1528D using the 8654-8654-110 cable.

1. Connect the SFF-8654 connector of the 8654-8654-110 cable to the backplane.
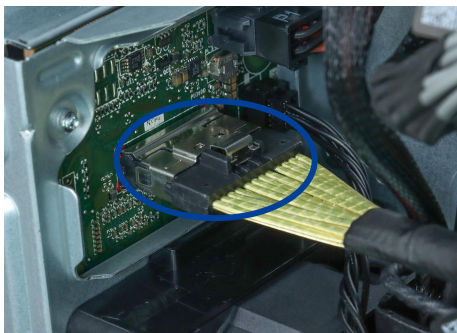
2. Connect the other SFF-8654 connector of the 8654-8654-110 cable to the R1528D.
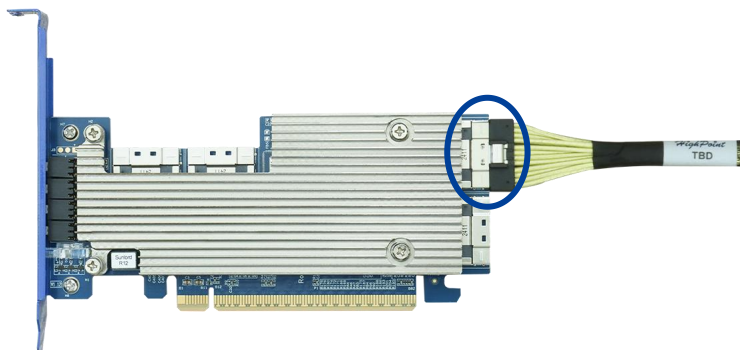
4.3. 8654-CIO8-110

SFF-8654 Host to MCIO Device cable. Each cable can host up to two NVMe SSDs. Length 1M.

4.3.1. Cable Diagram

SFF-8654　　　　　**MCIO**

4.3.2. Cable Drawings and Pinouts

The following figure shows the pinout for the HighPoint 8654-CIO8-110 cable, one x8 SFF-8654 to one x8 MCIO connection.

WIRING TABLE

Left diagram:
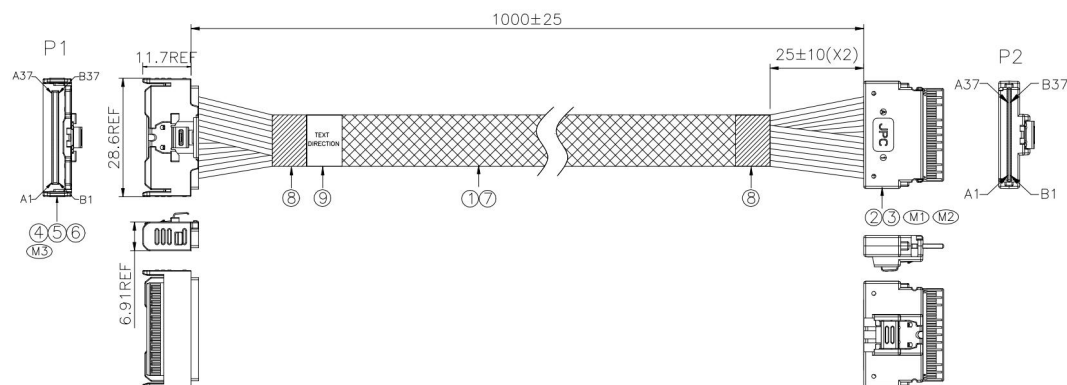
P1			P2		
GROUND	B37	B37	A37	A37	GROUND
TX7−	B36	B36	A36	A36	RX7−
TX7+	B35	B35	A35	A35	RX7+
GROUND	B34	B34	A34	A34	GROUND
TX6−	B33	B33	A33	A33	RX6−
TX6+	B32	B32	A32	A32	RX6+
GROUND	B31	B31	A31	A31	GROUND
SIDEBAND	B30	B30	A30	A30	SIDEBAND
SIDEBAND	B29	B29	A29	A29	SIDEBAND
GROUND	B28	B28	A28	A28	GROUND
SIDEBAND	B27	B27	A27	A27	SIDEBAND
SIDEBAND	B26	B26	A26	A26	SIDEBAND
GROUND	B25	B25	A25	A25	GROUND
TX5−	B24	B24	A24	A24	RX5−
TX5+	B23	B23	A23	A23	RX5+
GROUND	B22	B22	A22	A22	GROUND
TX4−	B21	B21	A21	A21	RX4−
TX4+	B20	B20	A20	A20	RX4+
GROUND	B19	B19	A19	A19	GROUND
TX3−	B18	B18	A18	A18	RX3−
TX3+	B17	B17	A17	A17	RX3+
GROUND	B16	B16	A16	A16	GROUND
TX2−	B15	B15	A15	A15	RX2−
TX2+	B14	B14	A14	A14	RX2+
GROUND	B13	B13	A13	A13	GROUND
SIDEBAND	B12	B12	A12	A12	SIDEBAND
SIDEBAND	B11	B11	A11	A11	SIDEBAND
GROUND	B10	B10	A10	A10	GROUND
SIDEBAND	B9	B9	A9	A9	SIDEBAND
SIDEBAND	B8	B8	A8	A8	SIDEBAND
GROUND	B7	B7	A7	A7	GROUND
TX1−	B6	B6	A6	A6	RX1−
TX1+	B5	B5	A5	A5	RX1+
GROUND	B4	B4	A4	A4	GROUND
TX0−	B3	B3	A3	A3	RX0−
TX0+	B2	B2	A2	A2	RX0+
GROUND	B1	B1	A1	A1	GROUND

Right diagram:

| P1			P2		
GROUND	A37	A37	B37	B37	GROUND
RX7−	A36	A36	B36	B36	TX7−
RX7+	A35	A35	B35	B35	TX7+
GROUND	A34	A34	B34	B34	GROUND
RX6−	A33	A33	B33	B33	TX6−
RX6+	A32	A32	B32	B32	TX6+
GROUND	A31	A31	B31	B31	GROUND
SIDEBAND	A30	A30	B30	B30	SIDEBAND
SIDEBAND	A29	A29	B29	B29	SIDEBAND
GROUND	A28	A28	B28	B28	GROUND
SIDEBAND	A27	A27	B27	B27	SIDEBAND
SIDEBAND	A26	A26	B26	B26	SIDEBAND
GROUND	A25	A25	B25	B25	GROUND
RX5−	A24	A24	B24	B24	TX5−
RX5+	A23	A23	B23	B23	TX5+
GROUND	A22	A22	B22	B22	GROUND
RX4−	A21	A21	B21	B21	TX4−
RX4+	A20	A20	B20	B20	TX4+
GROUND	A19	A19	B19	B19	GROUND
RX3−	A18	A18	B18	B18	TX3−
RX3+	A17	A17	B17	B17	TX3+
GROUND	A16	A16	B16	B16	GROUND
RX2−	A15	A15	B15	B15	TX2−
RX2+	A14	A14	B14	B14	TX2+
GROUND	A13	A13	B13	B13	GROUND
SIDEBAND	A12	A12	B12	B12	SIDEBAND
SIDEBAND	A11	A11	B11	B11	SIDEBAND
GROUND	A10	A10	B10	B10	GROUND
SIDEBAND	A9	A9	B9	B9	SIDEBAND
SIDEBAND	A8	A8	B8	B8	SIDEBAND
GROUND	A7	A7	B7	B7	GROUND
RX1−	A6	A6	B6	B6	TX1−
RX1+	A5	A5	B5	B5	TX1+
GROUND	A4	A4	B4	B4	GROUND
RX0−	A3	A3	B3	B3	TX0−
RX0+	A2	A2	B2	B2	TX0+
GROUND	A1	A1	B1	B1	GROUND

4.3.3. Cable Connection

The following steps show the connection of an NVMe SSD to the R1528D using the 8654-CIO8-110 cable.

1. Connect the MCIO connector of the 8654-CIO8-110 cable to the backplane.

2. Connect the SFF-8654 connector of the 8654-CIO8-110 cable to the R1528D.

4.4. 8654-8643-210

SFF-8654 Host to SFF-8643 Device cable. Each cable can host up to two NVMe SSDs. Length: 1M.

4.4.1. Cable Diagram

SFF-8643

SFF-8654

4.4.2. Cable Drawings and Pinouts

The following figure shows the HighPoint 8654-8643-210 cable pinout, one x8 SFF-8654 to two x4 SFF-8643 connection.

⚠ WIRING TABLE

THINLINE 8i (PA) ↔ 8643 P0

THINLINE 8i	PA		P0	8643 P0
GROUND	A1		D3	GROUND
PERp0	A2		D4	PETp0
PERn0	A3		D5	PETn0
GROUND	A4		C3	GROUND
PERp1	A5		C4	PETp1
PERn1	A6		C5	PETn1
GROUND	A7		C6	GROUND
BP_TYPEA(VSPA)	A8		D2	REFCLKA−(VSPA−)
CWAKEA#,OBFFA,(VSPA)	A9		D1	CPRSNTA#(VSPA)
GROUND	A10			
REFCLKA+(VSPA+)	A11		A2	BP_TYPEA(VSPA)
REFCLKA−(VSPA−)	A12		A1	2W_CLK
GROUND	A13		D6	GROUND
PERp2	A14		D7	PETp2
PERn2	A15		D8	PETn2
GROUND	A16		D9	GROUND
PERp3	A17		C7	PETp3
PFRn3	A18		C8	PETn3
GROUND	A19		C9	GROUND

8643 P1 20Bay BP3−1 (PA continued)

	PA		P1	8643 20Bay BP3−1
PERp4	A20		D3	GROUND
PERn4	A21		D4	PETp4
GROUND	A22		D5	PETn4
PERp5	A23		C3	GROUND
PERn5	A24		C4	PETp5
GROUND	A25		C5	PETn5
BP_TYPEB(VSPB)	A26		C6	GROUND
CWAKEA#,OBFFA,(VSPB)	A27		D2	REFCLKB−(VSPB−)
GROUND	A28		D1	PRSNTB#(VSPB)
REFCLKB+(VSPB+)	A29		A2	BP_TYPEB(VSPB)
REFCLKB−(VSPB−)	A30		A1	2W−CLKB(VSPB)
GROUND	A31		D6	GROUND
PERp6	A32		D7	PETp6
PERn6	A33		D8	PETn6
GROUND	A34		D9	GROUND
PERp7	A35		C7	PETp7
PERn7	A36		C8	PETn7
GROUND	A37		C9	GROUND

THINLINE 8i (PA) ↔ 8643 P0 (right)

THINLINE 8i	PA		P0	8643 P0
GROUND	B1		B3	GROUND
PETp0	B2		B4	PERp0
PETn0	B3		B5	PERn0
GROUND	B4		A3	GROUND
PETp1	B5		A4	PERp1
PETn1	B6		A5	PERn1
GROUND	B7		A6	GROUND
2W_CLK	B8	RED	C1	PERSTA#(VSPA)
2W_DATAA	B9	BLUE	C2	REFCLKA+(VSPA+)
	B10	YELLOW	B1	2W_DATAA
PERSTA#(VSPA)	B11	GREEN	B2	CWAKEA#,OBFFA,(VSPA)
CPRSNTA#(VSPA)	B12	N/C		
GROUND	B13		B6	GROUND
PETp2	B14		B7	PERp2
PETn2	B15		B8	PERn2
GROUND	B16		B9	GROUND
PETp3	B17		A7	PERp3
PETn3	B18		A8	PERn3
GROUND	B19		A9	GROUND

8643 P1 20Bay BP3−1 (right continued)

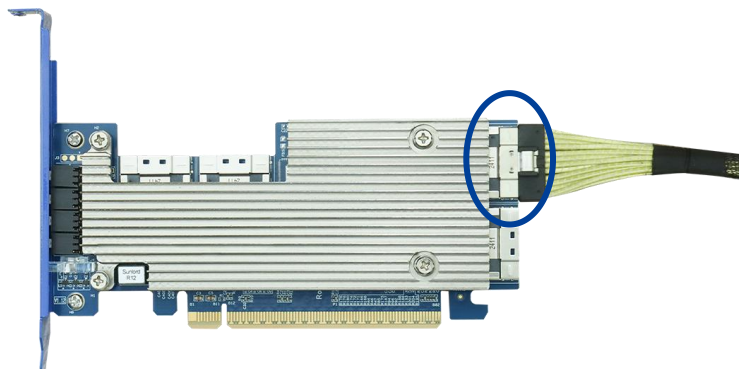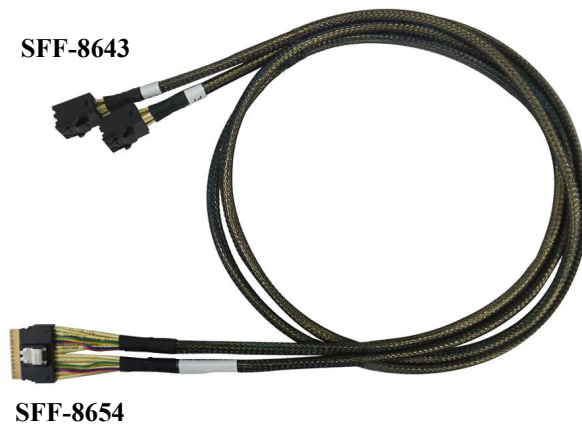|	PA		P1	8643 20Bay BP3−1
PETp4	B20		B3	GROUND
PETn4	B21		B4	PERp4
GROUND	B22		B5	PERn4
PETp5	B23		A3	GROUND
PETn5	B24		A4	PERp5
GROUND	B25		A5	PERn5
2W−CLKB(VSPB)	B26	RED	A6	GROUND
2W−DATAB(VSPB)	B27	BLUE	C1	PERSTB#(VSPB)
	B28	YELLOW	C2	REFCLKB+(VSPB+)
PERSTB#(VSPB)	B29	GREEN	B1	2W−DATAB(VSPB)
PRSNTB#(VSPB)	B30	N/C	B2	CWAKEA#,OBFFA,(VSPB)
GROUND	B31		B6	GROUND
PETp6	B32		B7	PERp6
PETn6	B33		B8	PERn6
GROUND	B34		B9	GROUND
PETp7	B35		A7	PERp7
PETn7	B36		A8	PERn7
GROUND	B37		A9	GROUND

4.4.3. Cable Connection

The following steps show the connection of the SSD enclosure to the R1528D using the 8654-8643-210 cable.

4. Connect the SFF-8643 connector of the 8654-8643-210 cable to the SSD enclosure.

5. Connect the SFF-8654 connector of the 8654-8643-210 cable to the R1528D.
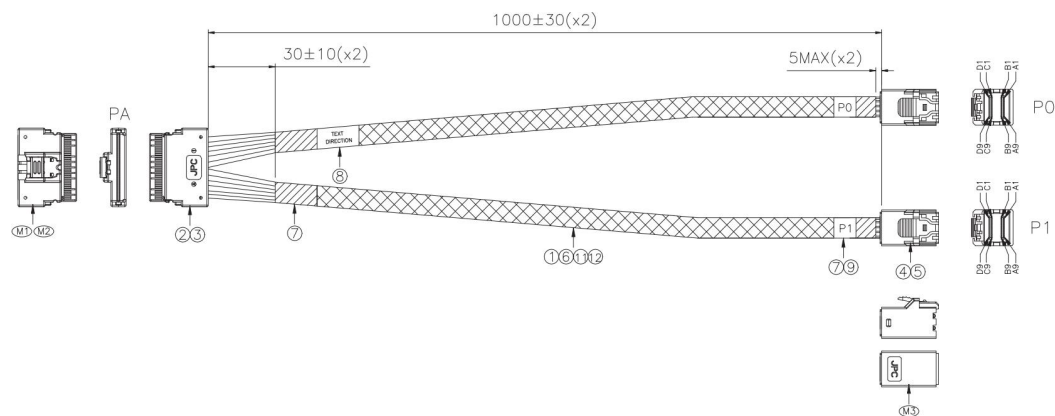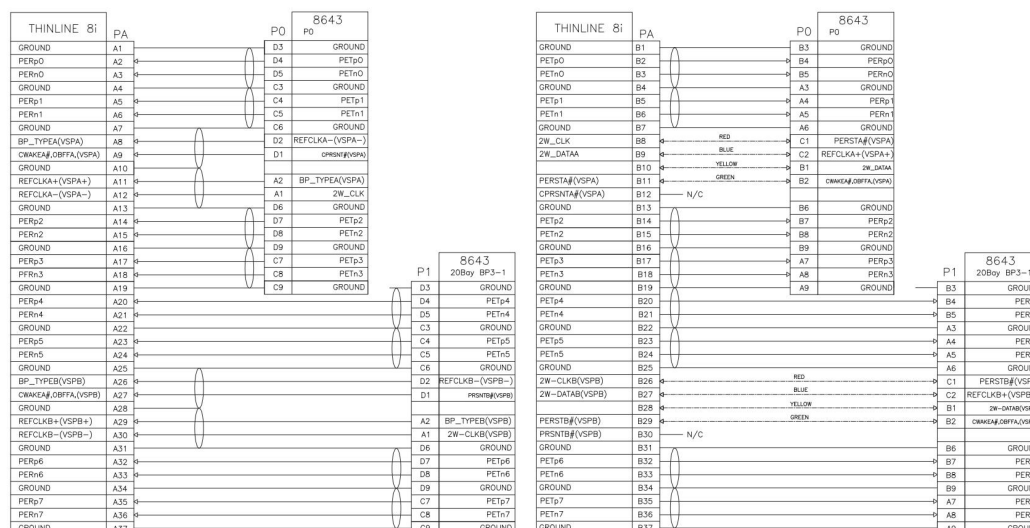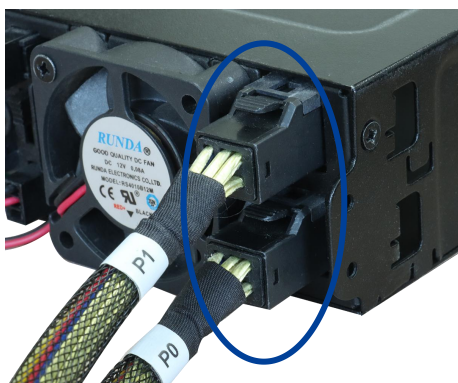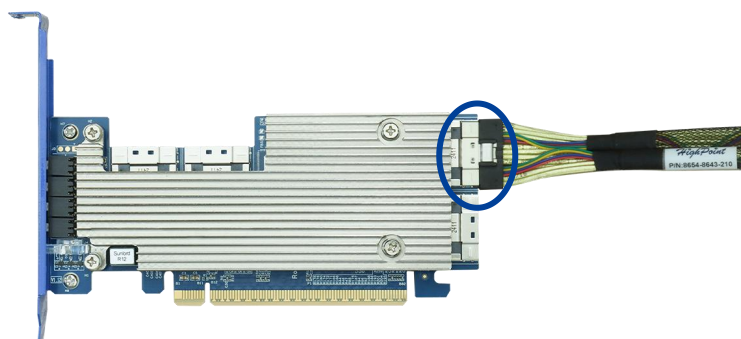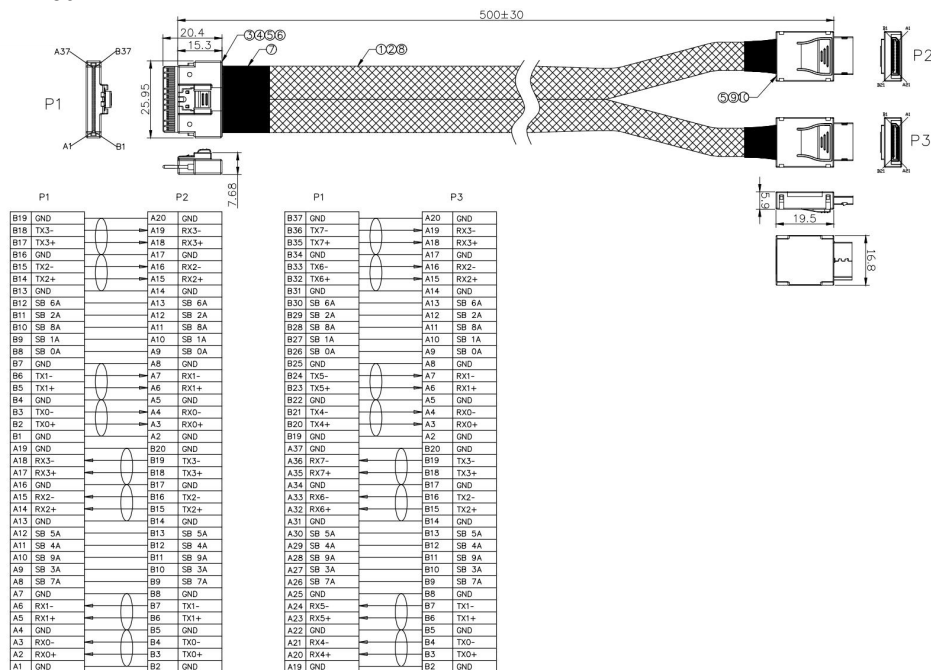
4.5. 8654-8611-205

SFF-8654 Host to SFF-8611 Device cable. Each cable can host up to two NVMe SSDs. Length: 0.5M.

4.5.1. Cable Diagram

4.5.2. Cable Drawings and Pinouts

The following figure shows the HighPoint 8654-8611-205 cable pinout, one x8 SFF-8654 to two x4 SFF-8611 connection.
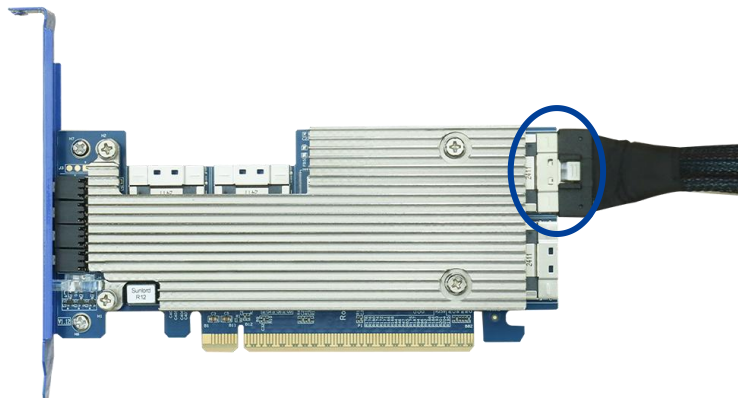
4.5.3. Cable Connection

The following steps show the connection of the SSD enclosure to the R1528D using the 8654-8611-205 cable.

1. Connect the SFF-8611 connector of the 8654-8611-205 cable to the SSD enclosure.

2. Connect the SFF-8654 connector of the 8654-8611-205 cable to the R1528D.

5. R1528D Installation Instructions

The R1528D provides four SFF-8654 connectors. These connectors accept a variety of HighPoint Certified Cable Accessories (see the Accessories section towards the end of this guide for more information). The following steps explain how to connect U.2 NVMe SSDs directly to the R1528D using the HighPoint TS8i-8639-060 cable.

1. Use a wired ESD wrist strap that is properly grounded.

2. Unpack and remove the R1528D 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. Align the R1528D to one of the motherboard's available slots. Press down gently but firmly to seat the R1528D correctly in the slot.
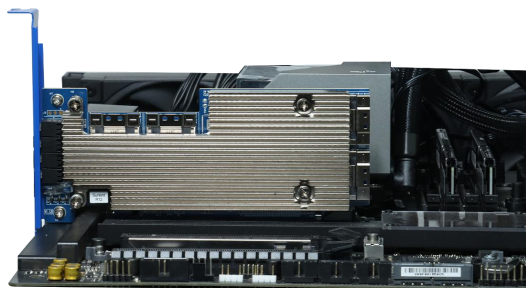
5. Connect the SFF-8639 connector of the TS8i-8639-060 cable to the NVMe SSD, and connect the 15-pin SATA power connector to the power supply
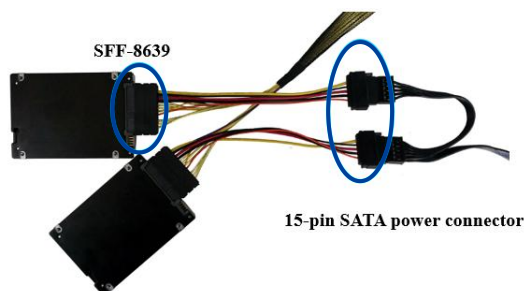
6. Connect the SFF-8654 connector of the TS8i-8639-060 cable to the R1528D.
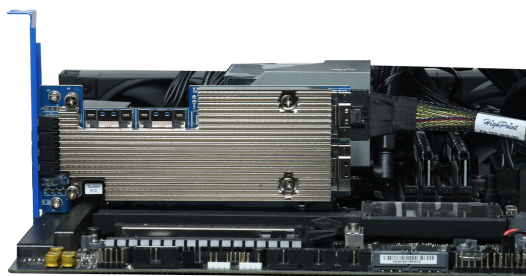
7. Connect the remaining NVMe SSDs to the R1528D as described above.

8. Turn on the power to the system.

6. Revision History

6.1. Version 1.00, Apr. 25, 2024

Initial version.

6.2. Version 1.01, February 5, 2025

1. Add UBM Backplane with x8 Connectors
2. Add UBM Backplane with x4 Connectors
3. Add UBM Backplane Connection (8 Disks)
4. Add UBM Backplane Connection (32 Disks)
5. Add Backplane with x8 Connectors and VPP
6. Add Backplane with x4 Connectors and VPP

6.3. Version 1.02, March 17, 2025

Adjusting the UBM/ VPP cable connection order.

6.4. Version 1.03, June 23, 2025

Adjust the description format of the Status LED (be more concise).