HighPoint

Technologies, Inc.

Rocket 7528D
PCIe Gen4 x16 to 4x SlimSAS NVMe RAID Adapter

Ultra-Dense, High-Performance PCIe Gen4 2.5" NVMe RAID Solution for Professional Server & Workstation Applications

The Rocket 7528D 2nd Generation PCIe Gen4 NVMe RAID Adapter was designed for professional applications that require uncompromised Storage Performance with the flexibility of proven RAID technology and the industry's most comprehensive storage health Monitoring & Management suite. It can directly support up to eight 2.5" U.2 or U.3 NVMe SSDs via four SlimSAS SFF-8654 Ports and cable-to-backplane connectivity.

Hosted media can be configured into as many as 4 separate RAID 0, 1 or 10 arrays, including bootable volumes or mixed configurations of single SSDs and arrays. In addition, Rocket 7528D Adapters are Hot-Plug & Hot-Swap capable; administrators can easily add or remove RAID arrays and individual NVMe SSDs without rebooting the OS or powering down the host platform.

48 Lanes of Dedicated PCIe Gen5 Bandwidth

HighPoint's High-Performance PCIe Gen4 switching architecture integrates Broadcom's 48-Channel PEX88048 switch IC to provide x16 lanes of dedicated PCIe Gen4 upstream bandwidth and x4 lanes of dedicated downstream bandwidth to each device channel. The innovative architecture enables the Rocket 7528D to deliver up to 32GB/s of transfer bandwidth, minimize latency, and facilitate consistent, robust I/O throughput.

The Architecture employs a technique known as a "Synthetic Hierarchy" to isolate the host system's OS from any PCIe topology changes. This enables the Rocket 7528D to directly manage resource allocation to the downstream PCIe channels and provide true Hot-Swap /Hot-Plug capability by facilitating a more efficient interaction between the host CPU and PCIe switch.

Engineered to Enhance the Efficiency & Serviceability of Datacenter & Server Applications

The Rocket 7528D incorporates a wide range of features designed to enhance the efficiency of day-to-day operations of datacenter and Edge Server platforms. First and foremost, the adapter has been built to the highest standards of quality and reliability, and is fully compliant with PCIe Card Electromechanical (CEM) specifications. The Rocket 7528D is a field replaceable unit (FRU); the VPD stored on each adapter enables customers and service providers to easily procure replacements with the correct firmware/driver combination.

The Rocket 7528D's OOB (out-of-band) management capability is an essential component of professional server infrastructure. MBC & MCTP over PCIe enables an administrator to securely interface with the adapter without the need for internet access. The service is scalable and can be used to administrate multiple servers via Linux command prompts to manage storage in both Pre-OS and OS-level environments.

True NVMe Hot-Swap & Hot-Plug Capability

The Rocket 7528D provides true NVMe SSD Hot-Swap and Hot-Plug capability; an essential feature for any professional server and datacenter platform. Administrators can safely add or remove individual SSDs or RAID arrays without rebooting the OS or powering down the host system.

The Rocket 7528D utilizes Synthetic Hierarchy to isolate the host operating system from any PCIe topology changes (physical changes) and any events associated with the sudden addition or removal of an NVMe device. The adapter accomplishes this by creating virtual "placeholders" to reserve dedicated resources for each of the eight NVMe downstream ports whenever the system is booted. This technique ensures these channels remain active at all times. Adding an SSD will temporarily replace the corresponding placeholder. Likewise, removing an SSD will reactivate the corresponding placeholder.

PCIe Gen4 Hyper-Cooling Solution

The Rocket 7528D's Low-Noise Hyper-Cooling solution combines the industry's most advanced PCIe Gen4 hardware cooling system with a suite of pro-active monitoring and management tools designed to keep temperatures in check under the most grueling working conditions. The Rocket 7528D's passive, fan-less cooling system pairs copper piping with an aluminum heat exchanger for maximum thermal efficiency & durability. This Zero-Maintenance design is ideal Server & Data Center applications. SHI (Storage Health Inspector) enables administrators can instantly asses the operating status of hosted NVMe media via S.M.A.R.T. (self-monitoring and reporting technology), and customize temperature thresholds for each NVMe SSD.

Comprehensive Storage Health Monitoring, Management & Analysis Suite

The Rocket 7528D is equipped with HighPoint's intuitive yet comprehensive monitoring, management and analysis suite, which enables administrators to easily configure and maintain the platform's NVMe storage ecosystem with a few simple clicks and commands. SSDs and RAID 0, 1 and 10 arrays created and managed using these interfaces will be recognized as single, physical disks by the host platform, and can be used to install a bootable OS.

Intelligent, Self-Diagnostic LEDs

HighPoint PCIe Gen4 AICs and Adapters feature Built-In Early Warning LED Indicators. Simple color coding and flash-patterns enable administrators to instantly asses the operational status and condition of hosted SSDs and RAID arrays, the strength of the PCIe connection, and temperature of the PCIe switch hardware.
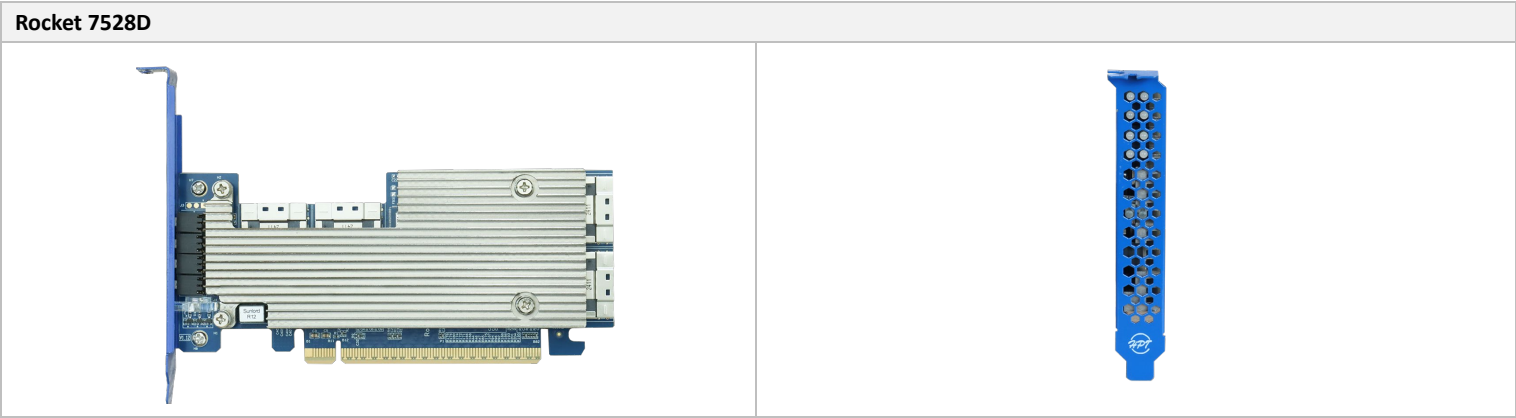
Feature Highlights

- 8-Dedicated PCIe 4.0 device channels
- Directly Supports up to 8x U.2/U.3 NVMe SSDs via 4x SlimSAS x8 (SFF-8654) Ports & industry standard backplane connectivity
- High-Performance 48-Lane Gen4 Switch Architecture: x16 lanes of dedicated upstream & x4 lanes of downstream bandwidth for each device channel
- Delivers 32GB/s of Bandwidth & Real-world Sustained transfer speeds up to 27,000MB/s
- Integrated NVMe Hot-Plug & Hot-Swap Capability
- PCIe Gen4 Hyper-Cooling Solution
- Comprehensive Storage Health Monitoring & Management Suite
- Industry-proven NVMe RAID Technology supports up to four RAID 0, 1 or 10 configurations
- Optional Boot-RAID Capability for Linux & Windows
- SafeStorage TCG SSD Solution

Product Model	Rocket 7528D (R7528D)
Hardware Features	
Bus Interface	PCIe 4.0 x16
Number of Channel / Port	8x Device Channels / 4x SlimSAS Ports (Dedicated PCIe 4.0 x8 per port)
Connector Type	SlimSAS (SFF-8654 8x)
Connector Pinout Definition	SFF-9402 Compliant
Number of devices	8
Data Port Reconfiguration *(Downstream Configuration: 1x16 /2x8 /4x4 /8x2 /16x1)*	Yes
SSD Form Factor	U.2, U.3
External Power Support	No
SRIS and REFCLK Support	TBA; please contact Sales for more information
Downstream port containment	Yes
Read tracking	Yes
Synthetic Hierarchy	Yes
LED Indication	Intelligent, Self-Diagnostic LEDs
Audible Alarm	Yes
FRU Support	Yes
SSD Hot-Plug/Hot-Swap	Yes
OOB Management	Yes (BMC and MCTP over PCIe)
Storage Security Suite	
SED Support	SafeStorage OPAL SED Solution *(Windows & Linux)*
Backplane Features	
UBM Support	Yes
VPP Support	Yes
Mechanical Specifications	
Form Factor	LP-MD2
Card Dimensions	155mm x 68.9mm
Card Weight	0.75 lbs.
PCIe Bracket	Full-Height and Low-Profile Ventilated Brackets

Cooling Solution	Intelligent, Pro-Active PCIe Gen4 Cooling Solution • Full-Length Aluminum Heatsink (Passive) • Copper piping • Compliant with PCIe Specifications
Toolless SSD mounting system	N/A
Supported Systems	
OS *(64-bit only)*	Windows 11, 10 / Windows Server 2022, 2019, 2016 / Microsoft Hyper-V / RHEL, Debian, Ubuntu, Fedora, Proxmox & Rocky Linux (Linux kernel 3.10 and later)
Secure Boot	Yes (Windows Only)
NVMe Configuration	
RAID Support	Single, RAID 0, 1, 10
TRIM RAID Support	Single, RAID 0, 1, 10
Storage Mode - NVMe	
Data-RAID	Yes
Boot-RAID	Yes
NVMe RAID Management	
Management Suites	WebGUI (Browser-Based management tool), CLI (Command Line Interface - scriptable configuration tool), API package, UEFI HII
SMTP Email Alert Notification	Yes
Alarm Buzzer	Yes
Storage Health Inspector	Yes
NVMe SMART status	Yes
Automatic and configurable RAID Rebuilding Priority	Yes
Auto resume incomplete rebuilding after power on or reboot system	Yes
Single-RAID or Multi-RAID Arrays per Controller	Yes
Cross-Sync RAID Solution Across Controllers	Yes
Advanced RAID features	
Online Array Roaming	Yes
RAID Quick Initialization for fast array setup	Yes
Global Hot Spare Disk support	Yes

HighPoint
Technologies, Inc.

Operating Environment

Working Temp.	+5°C ~ + 55°C
Storage Temp.	-20°C ~ +80°C
Operating Voltage	PCIe: 12V, 3.3V
Power	29.58W
MTBF (Mean Time Before Failure)	> 5,000,000 hours at 40° C

Kit Contents

Kit Contents	R7528D NVMe RAID Adapter
	Low-Profile Ventilated Bracket
	QIG

Optional Accessories

Cabling	TS8i-8639-060
	8654-8643-210
	8654-8611-205
	8654-8654-110
	8654-CIO8-110

Rocket 7528D

nvm EXPRESS

PCI EXPRESS 4.0