BROADCOM®

Product Brief

9500 Series PCIe Gen 4.0 Tri-Mode Storage HBAs

12Gb/s SAS/SATA/PCIe (NVMe) Tri-Mode HBAs

Key Features

- Tri-Mode Storage Interface
  - 12Gb/s SAS
  - 6Gb/s SATA
  - Gen 4.0 PCIe (NVMe)
- Hardware Secure Boot
- Universal Bay Management (UBM) ready (SFF-TA-1005)
- 13,700 MBs (256K Seq Rd)
- 3M IOPs (4K RR)
- x8 PCIe Gen 4.0 Host Interface
  - Supports x8, x4, x2, x1 PCIe lanes at a transfer rate up to 16.0 GT/s per lane, full duplex
  - Lane and polarity reversal
- SFF-9402 Compliant Connector Pin-out
- Up to 1024 SAS/SATA devices
- Up to 32 NVMe devices
- Form Factor Friendly Cable Exit

Applications

- High-port direct attached connectivity applications
- Enterprise Databases
- Analytics Applications
- Medical Imaging
- Media Applications
- Flexible solutions for cloud computing

Overview

The Broadcom® HBA 9500 series of 12Gb/s SAS/SATA/PCIe (NVMe) Gen4 Tri-Mode storage adapters provides system and server OEMs and data centers with unprecedented flexibility and high performance at the lowest cost. Utilizing Broadcom's Tri-Mode SerDes technology, the HBAs enable the operation of NVMe, SAS, or SATA devices in a single drive bay, allowing for endless design flexibility.

Based on the Broadcom SAS3816 and SAS3808 eight-lane host PCIe to SAS/SATA/PCIe IOC controllers, the 9500 series adapters are the first HBAs to offer both PCIe Gen 4.0 host and PCIe Gen 4.0 storage interfaces. PCIe Gen 4.0 enables these adapters for high bandwidth by delivering twice the bandwidth and 75% more IOPs.

Tri-Mode SerDes Technology

Broadcom's Tri-Mode SerDes technology enables operation of NVMe, SAS, or SATA storage devices in a single drive bay. A single adapter can operate in all three modes concurrently servicing NVMe, SAS, or SATA drives. The adapter negotiates between speeds and protocols to seamlessly work with any of the three types of storage devices. Tri-Mode support provides a non-disruptive way to evolve existing data center infrastructure. By upgrading to a Tri-Mode adapter, users can expand beyond SAS/SATA and use NVMe without major changes to other system configurations. The 9500 series adapters are compatible with existing PCI Express SFF-8639 Module (U.2) backplanes allowing users to boost performance for today's ever increasing bandwidth requirements.

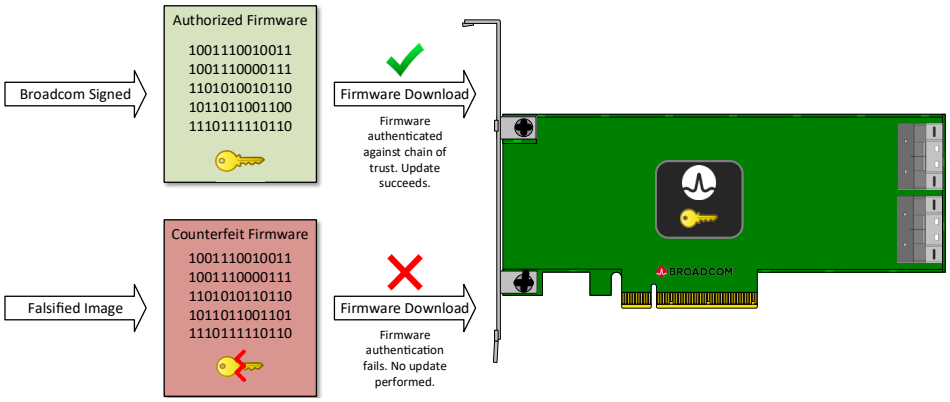
As next-generation systems expand the adoption of Tri-Mode SerDes technology through implementation of the SFF-TA-1001 and SFF-TA-1005 standards, the 9500 series adapters allow users to get the most performance and flexibility. The SFF-TA-1001 specification commonly known as U.3 defines a common bay type and connector for SAS (x1, x2, x4), SATA, and NVMe (x1, x2, x4) devices. The creation of the U.3 standard gives unprecedented flexibility to System OEMs and Data Centers that want to support the latest storage technologies at the lowest cost and system complexity. With a single 9500 series adapter, system implementers can take full advantage of SAS, SATA, and x1, x2, and x4 NVMe drives in U.3-based backplane.

Control and management of multi-protocol (SAS/SATA/NVMe) backplanes has been loosely defined in previous generations of products. Recognizing this, Broadcom worked with key industry members to introduce Universal Backplane Management (UBM) or SFF-TA-1005. UBM builds upon current management frameworks to provide a comprehensive approach to managing SAS, SATA, and NVMe. The 9500 series adapters are UBM ready, and customers can immediately integrate these adapters into their U.3 backplanes utilizing UBM.

Hardware Secure Boot

The on-board controller incorporates advanced security through hardware secure boot. The hardware secure boot feature permits only authenticated firmware to execute on the adapter. The controller's Internal Boot ROM establishes an initial Root of Trust (RoT). Hardware secure boot authenticates and builds a Chain of Trust (CoT) with succeeding firmware images using the RoT meaning only authorized firmware is executed on the adapter. Broadcom provides the signed firmware images making the use of hardware secure boot transparent to customers, while providing confidence in the security of the solution.

Simple Secure Boot



9500 Series HBAs	9500-16i	9500-8i	9500-16e	9500-8e
Port Count	16 internal	8 internal	16 external	8 external
Connectors	Two x8 SFF-8654	One x8 SFF-8654	4 x4 SFF-8644	2 x4 SFF-8644
Host Interface	x8 PCIe Gen 4.0	x8 PCIe Gen 4.0	x8 PCIe Gen 4.0	x8 PCIe Gen 4.0
Storage Interface	12Gb/s SAS, 6Gb/s SATA, Gen 4.0 PCIe (NVMe)	12Gb/s SAS, 6Gb/s SATA, Gen 4.0 PCIe (NVMe)	12Gb/s SAS, 6Gb/s SATA, Gen 4.0 PCIe (NVMe)	12Gb/s SAS, 6Gb/s SATA, Gen 4.0 PCIe (NVMe)
Management Utilities	• LSI Storage Authority (LSA) • StorCLI (command-line interface) • HII (UEFI Human Interface Infrastructure)			
OS Support	Microsoft Windows, VMware vSphere/ESXi, Red Hat Enterprise Linux, SuSE Linux, Ubuntu Linux, Citrix XenServer, CentOS Linux, Debian Linux, Oracle Enterprise Linux, Fedora, FreeBSD. See broadcom.com/support/download-search for details on versions.			
Dimensions	9500-16i/8i: 6.127 in. × 2.712 in. (155.65 mm × 68.90 mm) 9500-16e/8e: 6.600 in. × 2.712 in. (167.65 mm × 68.90 mm)			
Operating Conditions	Operating: 0°C to 55°C, 5% to 90% non-condensing Storage: –45°C to +105°C, 5% to 95% non-condensing			
Typical Power	8.9W	5.96W	8.74W	6.12W
Operating Voltage	12V ±8%; 3.3V ±9%	12V ±8%; 3.3V ±9%	12V ±8%; 3.3V ±9%	12V ±8%; 3.3V ±9%
MTBF (Calculated)	>5,000,000 hours at 40°C			
Hardware Warranty	3 years	3 years	3 years	3 years
Regulatory Certifications	USA (FCC 47 CFR part 15 Subpart B, class B); Canada (ICES -003, Class B); Taiwan (CNS 13438); Japan (VCCI V-3); Australia/New Zealand (AS/NZS CISPR 22); Korea (RRA no 2013-24 and 25); Europe (EN55022/EN55024); Safety: EN/IEC/UL 60950; RoHS; WEEE			
Ordering Information				
Single Pack	9500-16i: 05-50134-00	9500-8i: 05-50134-01	05-50075-00	05-50075-01

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For more product information: broadcom.com

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