BROADCOM®

SELECTION GUIDE

Data Center Solutions

broadcom.com

The amount and variety of data produced by content-rich Internet, cloud and enterprise applications poses unprecedented challenges for data centers of all sizes.

New approaches and technologies are needed to manage this deluge of data: to store it, protect it, and maximize the value from it. These challenges present opportunities to help the world make the most from its data.

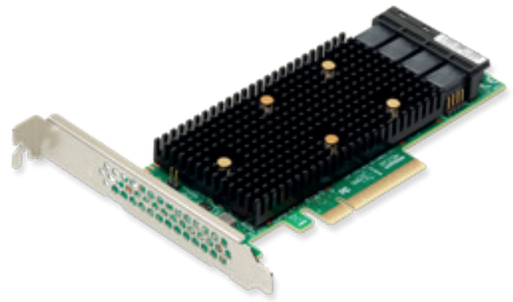
Broadcom is focused on helping customers in wireless communications, wired infrastructure, enterprise storage and industrial and other markets solve their challenges. Broadcom has the industry's broadest portfolio of storage solutions, backed by decades of experience and trusted by the world's leading server and storage suppliers. Broadcom provides the building blocks for storage solutions that help customers understand, prioritize, store and protect critical data.

Whether you need to protect data, power your storage solutions, or deliver the performance needed by critical applications, Broadcom's products are the smart choice.

Table of Contents

Host Bus Adapters (HBAs)

Equip storage solutions with the connectivity needed to meet any scaling needs from the smallest SMBs to the largest data centers. Broadcom HBAs can enable an easy, longterm storage growth strategy in practically any direct-attached storage scenario. Whether solutions use SAS or SATA, NVMe (PCIe), hard disk or flash, or even internal or external storage elements, our HBAs are designed to create the fabric tying any or all of those components together into a unified storage effort.

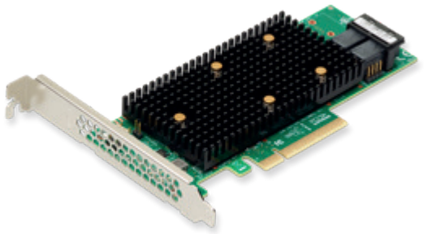


HBA Specifications

Product Name	MPN (SGL)	Form Factor Ports	Ports	Connectors	Bus Interface	Max Devices Supported		RAID Levels
						SAS/SATA	NVMe	
12Gb/s SAS/SATA/NVMe								
9500-16i	05-50077-02	LP-MD2	16	Two SFF-8654	x8 PCIe Gen 4.0	1024	32	JBOD
9500-8i	05-50077-03	LP-MD2	8	One SFF-8654	x8 PCIe Gen 4.0	1024	32	JBOD
9500-16e	05-50075-00	LP-MD2	16	Four SFF-8644	x8 PCIe Gen 4.0	1024	32	JBOD
9500-8e	05-50075-01	LP-MD2	8	Two SFF-8644	x8 PCIe Gen 4.0	1024	32	JBOD
9405W-16i	05-50047-00	LP-MD2	16	Four SFF-8643	x8 PCIe Gen 3.0	1024	24	JBOD
9405W-16e	05-50044-00	LP-MD2	16	Four SFF-8644	x8 PCIe Gen 3.0	1024	24	JBOD
9400-8i8e	05-50031-02	LP-MD2	16	Two SFF-8643; Two SFF-8644	x8 PCIe Gen 3.0	1024	24	JBOD
9400-16i	05-50008-00	LP-MD2	16	Four SFF-8643	x8 PCIe Gen 3.0	1024	24	JBOD
9400-16e	05-50013-00	LP-MD2	16	Four SFF-8644	x8 PCIe Gen 3.0	1024	24	JBOD
9400-8i	05-50008-01	LP-MD2	8	Two SFF-8643	x8 PCIe Gen 3.0	1024	24	JBOD
9400-8e	05-0013-01	LP-MD2	8	Two SFF-8644	x8 PCIe Gen 3.0	1024	24	JBOD
12Gb/s SAS/SATA								
9305-24i	05-25699-00	LP-MD2	24	Six SFF-8643	x8 PCIe Gen 3.0	1024		JBOD
9305-16e	05-25704-00	LP-MD2	16	Four SFF-8644	x8 PCIe Gen 3.0	1024		JBOD
9305-16i	05-25703-00	LP-MD2	16	Four SFF-8643	x8 PCIe Gen 3.0	1024		JBOD
9302-16e	05-25688-00	Full-Height	16	Four SFF-8644	x8 PCIe Gen 3.0	1024		JBOD
9300-8e	H5-25460-00	LP-MD2	8	Two SFF-8644	x8 PCIe Gen 3.0	1024		JBOD
9300-8i	H5-25573-00	LP-MD2	8	Two SFF-8643	x8 PCIe Gen 3.0	1024		JBOD
9300-4i4e	H5-25515-00	LP-MD2	8	One SFF-8643 One SFF-8644	x8 PCIe Gen 3.0	1024		JBOD
9300-4i	H5-25473-00	LP-MD2	4	One SFF-8643	x8 PCIe Gen 3.0	1024		JBOD

MegaRAID Entry (iMR)

MegaRAID SAS/SATA/NVMe entry controller cards provide trusted MegaRAID data protection and reliability for non-business critical applications. Offering the same management features and OS support as the mainstream MegaRAID lineup at an affordable price point, the entry controllers are great solutions for small and medium businesses (SMB) deploying entry-level server platforms and workstations.



MegaRAID Entry (iMR) Specifications

Product Name	MPN (SGL)	Form Factor Ports	Ports	Connectors	Bus Interface	Processor
12Gb/s SAS/SATA/NVMe						
9440-8i	05-50008-02	LP-MD2	8	Two SFF-8643	x8 PCIe Gen 3.0	SAS3408
12Gb/s SAS/SATA						
9341-4i	05-26105-00	LP-MD2	4	One SFF-8643	x8 PCIe Gen 3.0	SAS3008
9341-8i	05-26106-00	LP-MD2	8	Two SFF-8643	x8 PCIe Gen 3.0	SAS3008

MegaRAID

Ensure critical data is protected and available with the most widely deployed RAID data protection architecture. Broadcom enables high performance storage connectivity and flexible system designs that support any combination of NVMe, SAS and S ATA devices with the industry's first hardware RAID adapter with Tri-Mode SerDes technology.

The MegaRAID Tri-Mode storage adapters bring NVMe performance benefits to the storage tier by providing connectivity and data protection that MegaRAID technology has offered for over 20 years for SAS/SATA interfaces.

Broadcom's Tri-Mode SerDes technology enables operation of NVMe, SAS or SATA devices in a single drive bay. A single controller can operating in all three modes concurrently servicing NVMe, SAS or SATA devices. Tri-Mode support provides a non-disruptive way to evolve existing data center infrastructure.

MegaRAID Specifications

Product Name	MPN (SGL)	Form Factor	Ports	Connectors	Bus Interface	Max Devices Supported		Cache Memory	Cache Protection*
						SAS/SATA	NVMe		
12Gb/s SAS/SATA/NVMe									
9560-16i	05-50077-00	LP-MD2	16	Two SFF-8654	x8 PCIe Gen 4.0	240	32	8GB	CVPM05
9560-8i	05-50077-01	LP-MD2	8	One SFF-8654	x8 PCIe Gen 4.0	240	32	4GB	CVPM05
9580-8i8e	05-50076-00	LP-MD2	16	Two SFF-8654, Two SFF-8644	x8 PCIe Gen 4.0	240	32	8GB	CVPM05
9460-16i	05-50011-00	LP-MD2	16	Four SFF-8643	x8 PCIe Gen 3.0	240	24	4GB	CVPM05
9460-8i	05-50011-02	LP-MD2	8	Two SFF-8643	x8 PCIe Gen 3.0	240	24	2GB	CVPM05
9480-8i8e	05-50031-00	LP-MD2	16	Two SFF-8643, Two SFF-8644	x8 PCIe Gen 3.0	240	24	4GB	CVPM05
12Gb/s SAS/SATA									
9365-28i	05-50028-00	LP-MD2	28	Six SFF-8643, One SFF-8654	x8 PCIe Gen 3.0	240		4GB	CVPM05
9361-24i	05-50011-00	LP-MD2	24	Six SFF-8643	x8 PCIe Gen 3.0	240		4GB	CVPM02
9361-16i	05-25708-00	LP-MD2	16	Four SFF8643	x8 PCIe Gen 3.0	240		2GB	CVPM02
9361-8i	05-25420-08 05-25420-17	LP-MD2 LP-MD2	8 8	Two SFF-8643 Two SFF-8643	x8 PCIe Gen 3.0 x8 PCIe Gen 3.0	128 128		1GB 2GB	CVPM02 CVPM02
9361-4i	05-25420-10	LP-MD2	4	One SFF-8643	x8 PCIe Gen 3.0	128		1GB	CVPM02
9380-8e	05-25528-04	LP-MD2	8	Two SFF-8644	x8 PCIe Gen 3.0	240		1GB	CVPM02
9380-8i8e	05-25716-00	LP-MD2	16	Two SFF-8643, Two SFF-8644	x8 PCIe Gen 3.0	240		2GB	CVPM02
9380-4i4e	05-25190-02	LP-MD2	8	One SFF-8643, OneSFF-8644	x8 PCIe Gen 3.0	240		1GB	CVPM02

* CacheVault Kit/Power Module sold separately

Advanced Software

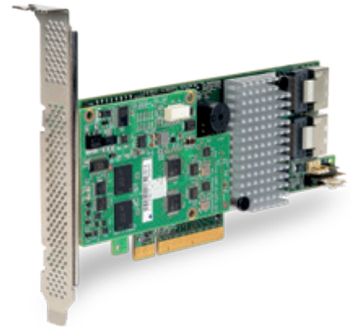
SafeStore™

Whether it is sensitive customer information, intellectual property or proprietary data that helps a company reach its strategic objectives, a company's data may be its most valuable asset. If this data is misplaced or stolen, organizations run the risk of lost revenue, legal implications and a tarnished reputation. With SafeStore™ software, businesses can be assured that the highest level of security is placed on their data, while preserving system performance and ease-of-use. Together with self- encrypting drives (SEDs), SafeStore software secures a drive's data from unauthorized access or modification resulting from theft, loss or repurposing of drives.

SafeStore Software

Product	MPN	Product Name
MegaRAID SafeStore Software Physical Key*	L5-25188-01	MegaRAID 9361, 9380, 9460 and 9480 Series

CacheCade® Pro 2.0



CacheCade Pro 2.0 software provides a combination of caching intelligence and trusted MegaRAID data protection to accelerate applications in direct- attached storage environments. When IT pushes hard disk drives (HDD) arrays to reach their I/O potential, data "hot spots" become inevitable. Utilizing a small solid state drive (SSD) investment as a front-side flash cache for the much larger disk array, CacheCade Pro 2.0 software dynamically keeps the "hottest" data in flash memory. This can dramatically improve read/write speeds and drop latency.

CacheCade Pro 2.0 Software

Product	MPN	Product Name
MegaRAID CacheCade Pro 2.0 Software Pack with Fast Path (physical key)	L5-25188-04	MegaRAID 9361 and 9380 Series

Cache Protection Options

RAID caching is a cost-effective way to improve I/O performance by writing data to a controllers' cache before it is written to disk. In write-back mode, data written to cache is vulnerable until it is made permanent on disk. To help avoid the possibility of data loss or corruption during a power or server failure, Broadcom offers the CacheVault flash cache protection module or the battery backup units for MegaRAID SAS controllers cards.

Cache Protection Product Specifications

Cache Protection Option	MPN	Compatible Controller Cards
CVPM05	05-50039-00	MegaRAID 9365, 9460, 9480, 9560 and 9580 Series
CVPM02	05-50038-00	MegaRAID 9361, 9380 Series
CVM02	05-25444-00	MegaRAID 9361 and 9380 Series
BBU-BRACKET-05	L5-25376-00	MegaRAID Remote Mounting Board for LSI BBUs and CacheVault Power Modules

For additional details, view the Cache Protection Options Matrix.

SAS/SATA Cables for 93xx and 94xx Series

Cable Specifications

Product	MPN (SGL)	Length	Sideband Support	To Controller	To Drives/ Backplane	RCompatible Controllers (“i” = internal connectivity, “e” = external connectivity)
CBL-SFF8644-8088-10M	L5-25196-00	1.0m		SFF-8644	SFF-8088	External connectivity: MegaRAID 9380 (-4i4e, -8e) MegaRAID 9480-8i8e SAS 9305-16e SAS 9300 (-4i4e, -8e) HBA 9400-16e (-8e) HBA 9405W-16e
CBL-SFF8644-8088-20M	L5-25199-00	2.0m				
CBL-SFF8644-8088-60M	L5-25194-00	6.0m				
CBL-SFF8644-10M	L5-25198-00	1.0m		SFF-8644	SFF-8644	
CBL-SFF8644-20M	L5-25201-00	2.0m				
CBL-SFF8644-60M	L5-25195-00	6.0m				
CBL-SFF8643-8087-06M	05-26117-00	0.6m		SFF-8643	SFF-8087	Internal connectivity: MegaRAID 9380-4i4e MegaRAID 9361 (-4i, -8i) MegaRAID 9341 (-4i, -8i) MegaRAID 9365-28i MegaRAID 9460-16i (-8i) MegaRAID 9480-8i8e MegaRAID 9440-8i SAS 9305 (16i, 24i) SAS 9300 (-4i, -4i4e, -8i) HBA 9400-16i (-8i) HBA 9405W-16i
CBL-SFF8643-8087-08M	05-26118-00	0.8m				
CBL-SFF8643-8087-10M	05-26119-00	1.0m				
CBL-SFF8643-06M	05-26114-00	0.6m		SFF-8643	SFF-8643	
CBL-SFF8643-08M	05-26113-00	0.8m				
CBL-SFF8643-10M	05-26112-00	1.0m				
CBL-SFF8643-SATASB-05M	L5-00219-00	0.5m	✓	SFF-8643	x4 SATA	
CBL-SFF8643-SATASB-06M	L5-00220-00	0.6m	✓			
CBL-SFF8643-SATASB-10M	L5-00221-00	1.0m	✓			
CBL-SFF8643-SAS8482SB-06M	L5-00222-00	0.6m	✓	SFF-8643	SFF-8482	
CBL-RA8643-04M	L5-00223-00	0.4m		SFF-8643 (RA)	SFF-8643	
CBL, RA x4 SFF-8654 to x4 SFF-8643 1M	05-50066-00	1.0M	✓	SFF-8654 (RA)	SFF-8643	9365-28i

U.2 Enabled Cables for 94xx Series

These cables enable connections from 9400 series MegaRAID and HBA Tri-Mode Adapters to NVMe storage devices either through backplane or direct to drive connections.

Cable Specifications

MPN	Description	Length	Side Bands Supported	To Controller	To Drives/Backplane	Compatible Controllers (i = internal, e = external connectivity)
05-50061-00*	Cable, U.2 Enabler, HD to HD(W) 1M	1m	Yes	x8 SFF-8643	2 x4 SFF-8643 Mini SAS HD (White)	Internal Connectivity: MegaRAID 9460 (-16i, 8i) MegaRAID 9480 (-8i8e) MegaRAID 9440 (-8i) HBA 9400 (-16i, -8i, -8i8e) HBA 9405W (-16i)
05-50062-00	Cable, U.2 Enabler, HD to OCuLink 1M	1m	Yes	x8 SFF-8643	2 x4 SFF-8612 OCu-Link	
05-50063-00	Cable, U.2 Enabler, HD to SlimLine 1M	1m	Yes	x8 SFF-8643	2 x4 SFF-8654 SlimLine	
05-50065-00	Cable, U.2 Enabler, HD to SFF8639 0.5M	0.5m	Yes	x8 SFF-8643	2 x4 SFF-8639 Direct Drive Connect	
05-50064-00	Cable, U.2 Enabler, HD to SFF8639 1M	1m	Yes	x8 SFF-8643	2 x4 SFF-8639 Direct Drive Connect	

*U.2 Enabled cable 05-50061-00 designed for SuperMicro NVMe enabled backplanes. These backplanes identify NVMe drive connections through white Mini SAS HD connectors.

Tri-Mode Cable for 95xx Adapter Generation

These cables enable connection from 95xx series MegaRAID and HBA Tri-Mode adapters to SAS, SATA, and PCIe (NVMe) devices.

Cable Specifications

MPN	Description	Length	Side Bands Supported	To Controller	To Drives/Backplane	Compatible Controllers (i = internal, e = external connectivity)
05-60001-00	Cable, x8 8654 to 2x4 8612, AltWiring 1M	1m	Yes	SFF-8654 (SlimSAS)	2 x4 SFF-8612 (OCu-Link)	9560-16i 9560-8i 9580-8i8e 9500-16i 9500-8i
05-60002-00	Cable, x8 8654 to 2x4 8643 (W), SMC 1M	1m	Yes	SFF-8654 (SlimSAS)	2 x4 SFF-8643 Mini SAS HD (NVMe Connection)*	
05-60003-00	Cable, x8 8654 to 2x4 8643, 9402 SAS 1M	1m	Yes	SFF-8654 (SlimSAS)	2 x4 SFF-8643 Mini SAS HD (SAS Connections)	
05-60004-00	Cable, x8 8654 to 2x4 8654, 9402 1M	1m	Yes	SFF-8654 (SlimSAS)	2 x4 SFF8654 SlimSAS	
05-60005-00	Cable, x8 8654 to 2xU.2 Direct, 1M	1m	Yes	SFF-8654 (SlimSAS)	2xU.2 Direct Connect	
05-60006-00	Cable, x8 8654 to 8xU.3 Direct 1M	1m	Yes	SFF-8654 (SlimSAS)	8xU.3 Direct Connect	
05-60007-00	Cable, x8 8654 to 1x8 8654, 9402 1M	1m	Yes	SFF-8654 (SlimSAS)	1 x8 SFF8654 SlimSAS	

Cable 05-60002-00 is designed for SuperMicro NVMe enabled backplanes using white Mini SAS HD connectors for the NVMe connections.

ETHERNET NETWORK ADAPTERS

NetXtreme® E-Series

Designed for today's enterprise and cloud-scale environments, Broadcom's NetXtreme® E-Series Ethernet network adapters are the ideal solution for high-performance virtualization, intelligent flow processing, secure data center connectivity, and machine learning.

Available in PCIe NIC and OCP mezzanine 2.0 and 3.0 form factors, Broadcom's Ethernet network adapters support configurations ranging from 1G to 200G, and utilizing both optical and copper connectivity.

- TruFlow™ engine accelerates virtual switch processing by 2x, reduces server CPU usage up to 50%
- Broadsafe™ embedded security provides Silicon Root of Trust, delivering industry's most secure Ethernet controller
- TruManage™ addresses end-user manageability needs to allow fine tuning of networks for maximum performance
- On-chip tunneling protocol processing for Geneve, VXLAN, and NVGRE provides up to a 5x throughput increase
- Low latency and high throughput RoCEv2 paves the way for machine learning and NVMe over Fabrics
- Acceleration engines for SDN and NFV enable leading-edge service provider solutions
- Modern architecture delivers industry's lowest latency and lowest CPU utilization for real-world network conditions

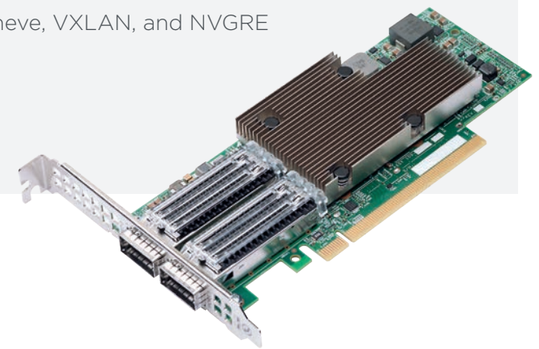
PCIe NIC Ethernet Adapters

Broadcom Ethernet adapters, are supported with a full suite of drivers for all major operating system distributions and versions. The latest firmware, drivers, and tools can be downloaded from **www.broadcom.com.**

PCIe NIC Ethernet Adapters

Key Features

- PCIe NIC 3.0-compliant
- Line-rate throughput from 1 Gb/s to 200 Gb/s
- 1-port, 2-port, and 4-port support
- DAC, copper, and fiber connectivity
- PCIe 3.0, PCIe 4.0 host interface
- 25G, 50G PAM-4 SerDes
- TruFlow™-configurable packet processor for virtual switch acceleration
- BroadSAFE® technology provides Silicon Root of Trust, secure boot, and secure key storage
- TruManage™ for cloud-scale manageability
- On-chip tunneling protocol processing for Geneve, VXLAN, and NVGRE
- Multi-host with ECN marking
- Hardware-based low-latency RoCE v1/v2
- SR-IOV up to 1K VFs
- GPUDirect acceleration



Portfolio and Ordering Information

Part Number	Name	Port Speed	I/O	Host I/F	Multihost
BCM957508-P2200G	P2200G	2× 200GbE	QSFP56	PCIe 4.0 ×16	Yes
BCM957508-P2100G	P2100G	2× 100GbE	QSFP56	PCIe 4.0 ×16	Yes
BCM957454A4540C	P1100p	1× 100GbE	QSFP28	PCIe 3.0 ×16	No
BCM957414A4140C	P150p	1× 50GbE	QSFP28	PCIe 3.0 ×8	No
BCM957504-P425G	P425G	4× 25GbE	SFP28	PCIe 4.0 ×16	Yes
BCM957414A4142CC	P225p	2× 25GbE/10GbE	SFP28	PCIe 3.0 ×8	No
BCM957412A4120AC	P210p	2× 10GbE	SFP+	PCIe 3.0 ×8	No
BCM957416A4160C	P210TP	2× 10GbE	RJ-45	PCIe 3.0 ×8	No
BCM95720A2003AC	BCM5720-2P	2x 1GbE	RJ-45	PCIe 2.0 x1	No
BCM95719A1904AC	BCM5719-4P	4x 1GbE	RJ-45	PCIe 2.0 x4	No

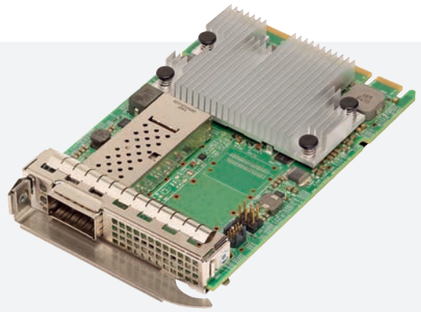
OCP NIC 3.0 Ethernet Adapters

Open Compute Project (OCP) allows cloud providers and server OEMs to utilize compact server designs that can accommodate higher power density for high-performance NICs with advanced hardware acceleration capabilities. The new form-factor also simplifies operations to lower the total cost of ownership.

Broadcom offers a complete OCP Ethernet portfolio supporting the full range of speeds and feeds, from 1G to 200G, on one same Small Form Factor (SFF). Broadcom utilizes its highest-performance market- leading silicon solutions for this portfolio, including Thor—the market's first 200G Ethernet controller.

Key Features

- OCP NIC 3.0-compliant
- Line-rate throughput from 1 Gb/s to 200 Gb/s
- 1-port, 2-port, and 4-port support
- DAC, copper, and fiber connectivity
- PCIe 3.0, PCIe 4.0 host interface
- 25G, 50G PAM-4 SerDes
- TruFlow™-configurable packet processor for virtual switch acceleration
- BroadSAFE® technology provides Silicon Root of Trust, secure boot, and secure key storage
- TruManage™ for cloud-scale manageability
- On-chip tunneling protocol processing for Geneve, VXLAN, and NVGRE
- Multi-host with ECN marking
- Hardware-based low-latency RoCE v1/v2
- SR-IOV up to 1K VFs
- GPUDirect acceleration



Portfolio and Ordering Information

Part Number	Name	Port Speed	I/O	Host I/F	Multihost
BCM95719-N1905C	N41T	4x 1G	RJ-45	PCIe 2.0 x4	No
BCM957412-N4120C	N210P	2x 10G	SFP+	PCIe 3.0 x8	No
BCM957416-N4160C	N210TP	2x 10GBASE-T	RJ-45	PCIe 3.0 x8	No
BCM957414-N4140C	N225P	2x 25G	SFP28	PCIe 3.0 x8	No
BCM957504-N425G	N425G	4x 25G	SFP28	PCIe 3.0/4.0 x16	Yes
BCM957504-N1100G	N1100G	1x 100G	QSFP56	PCIe 3.0/4.0 x16	Yes
BCM957508-N2100G	N2100G	2x 100G	QSFP56	PCIe 3.0/4.0 x16	Yes
BCM957508-N2200G	N2200G	2x 200G	QSFP56	PCIe 3.0/4.0 x16	Yes

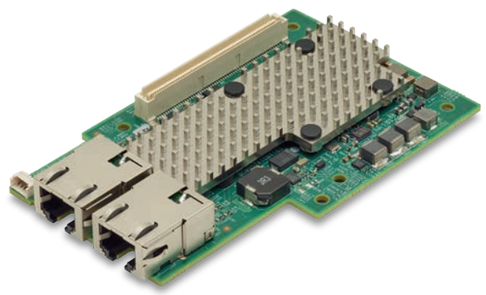
OCP NIC 2.0 Ethernet Adapters

Key Features

- OCP NIC 2.0-compliant
- Line-rate throughput from 1 Gb/s to 200 Gb/s
- 1-port, 2-port, and 4-port support
- DAC, copper, and fiber connectivity
- PCIe 3.0, PCIe 4.0 host interface
- 25G, 50G PAM-4 SerDes
- TruFlow™-configurable packet processor for virtual switch acceleration
- BroadSAFE® technology provides Silicon Root of Trust, secure boot, and secure key storage
- TruManage™ for cloud-scale manageability
- On-chip tunneling protocol processing for Geneve, VXLAN, and NVGRE
- Multi-host with ECN marking
- Hardware-based low-latency RoCE v1/v2
- SR-IOV up to 1K VFs
- GPUDirect acceleration
- PXE, UEFI network boot
- LSO/LRO/TSO/RSS

Portfolio and Ordering Information

Part Number	Name	Port Speed	I/O	Host I/F	Multihost
BCM957504-M1100G16	M1100G16	1× 100GbE	QSFP28	PCIe 4.0 ×16	No
BCM957452M4520C	M150PM	1× 50GbE	QSFP28	PCIe 3.0 ×8	Yes
BCM957414M4143C	M150P	1× 50GbE	QSFP28	PCIe 3.0 ×8	No
BCM957502-M150G	M150G	1× 50GbE	QSFP28	PCIe 4.0 ×8	Yes
BCM957414M4142C	M225p	2× 25GbE	SFP28	PCIe 3.0 ×8	No
BCM957412M4122C	M125p	1× 25GbE	SFP28	PCIe 3.0 ×8	No
BCM957412M4123C	M210p	2× 10GbE	SFP+	PCIe 3.0 ×8	No
BCM957416M4163C	M210TP	2× 10GBASE-T	RJ-45	PCIe 3.0 ×8	No



Recommended Fiber Optic Transceivers for Ethernet NICs

Optical Transceivers

Broadcom's Optical Transceivers are products that support insertion and removal of fiber optic connectors - for applications requiring flexibility in user handling, cable types and link distances. Available in host soldered and edge pluggable variants, these electrical-to-optical converters (transceivers) provide generations of optical connectivity at data rates up to 100Gb/s and link distances up to 10km (and beyond). Target applications include LAN Ethernet, SAN Fibre Channel, CPRI Mobile Fronthaul, SONET/OTN Telecommunications, InfiniBand and Proprietary Interconnect networks.

Recommended Fiber Optic Transceivers for PCIe NIC

Form Factor	Marketing Name Part Number	Ports	I/O	Fiber Optic Transceivers Part Number	Fiber Optic Transceivers Description
PCIe NIC	P210TP BCM957416A4160C	2x 10GBASE-T	RJ45	N/A	N/A
PCIe NIC	P210P BCM957412A4120AC	2x 10GbE	SFP+	AFBR-710SMZ	10G-SR
PCIe NIC	P225P BCM957414A4142CC	2x 25/10G	SFP28	AFBR-8CERxxZ	25G AOC, xx=length in meters, supports 25G rate only
				AFBR-735SMZ	Dual rate 10G/25G-SR, 10G rate is power up default, Rate select pins or registers must be used to change rate
PCIe NIC	P425G BCM957504-P425G	4x 25G	SFP28	AFBR-8CERxxZ	25G AOC, xx=length in meters, supports 25G rate only
				AFBR-735SMZ	Dual rate 10G/25G-SR, 10G rate is power up default, Rate select pins or registers must be used to change rate
PCIe NIC	P150P BCM957414A4140C	1x 50GbE	QSFP28	AFBR-89CDHZ	100G-SR4 (4x25G NRZ) (2x25G NRZ mode supported)
PCIe NIC	P1100p BCM957454A4540C	1x 100GbE	QSFP28	AFBR-89CDHZ	100G-SR4 (4x25G NRZ)
PCIe NIC	P2100G BCM957508-P2100G	2x 100G	QSFP56	AFBR-89CDHZ	100G-SR4 (4x25G NRZ)
				AFBR-93CDDZ	200G-SR4 (4x50G PAM4) in development
PCIe NIC	P2200G BCM957508-P2200G	2x 200GbE	QSFP56	AFBR-93CDDZ	200G-SR4 (4x50G PAM4) in development
PCIe NIC	P2200G	2x 200GbE	QSFP56	AFBR-93CDDZ	200G-SR4 (4x50G PAM4) in development

Recommended Fiber Optic Transceivers for Ethernet NICs

Recommended Fiber Optic Transceivers for PCIe SmartNIC

Form Factor	Marketing Name Part Number	Ports	I/O	Fiber Optic Transceivers Part Number	Fiber Optic Transceivers Description
PCIe SmartNIC	PS225-H08 BCM958802A8048C	2x 25GbE	SFP28	AFBR-8CERxxZ	25G AOC , xx=length in meters, supports 25G rate only
				AFBR-735SMZ	Dual rate 10G/25G-SR, 10G rate is power up default, Rate select pins or registers must be used to change rate
PCIe SmartNIC	PS225-H16 BCM958802A8046C	2x 25GbE	SFP28	AFBR-8CERxxZ	25G AOC , xx=length in meters, supports 25G rate only
				AFBR-735SMZ	Dual rate 10G/25G-SR, 10G rate is power up default, Rate select pins or registers must be used to change rate
PCIe SmartNIC	PS1100R Active HS BCM958804A8040C	1x 100GbE	QSFP28	AFBR-89CDHZ	100G-SR4 (4x25G NRZ)
PCIe SmartNIC	PS1100R Passive HS BCM958804A8041C	1x 100GbE	QSFP28	AFBR-89CDHZ	100G-SR4 (4x25G NRZ)

Recommended Fiber Optic Transceivers for OCP 2.0 Form Factor

Form Factor	Marketing Name Part Number	Ports	I/O	Fiber Optic Transceivers Part Number	Fiber Optic Transceivers Description
OCP 2.0	M210TP BCM957416M4163C	2 x 10GBASE-T	RJ45	N/A	N/A
OCP 2.0	M210P BCM957412M4123C	2 x 10GbE	SFP+	AFBR-710SMZ	10G-SR
OCP 2.0	M125P BCM957412M4122C	1 x 25/10GbE	SFP28	AFBR-8CERxxZ	25G AOC , xx=length in meters, supports 25G rate only
				AFBR-735SMZ	Dual rate 10G/25G-SR, 10G rate is power up default, Rate select pins or registers must be used to change rate
OCP 2.0	M225P BCM957414M4142C	2 x 25/10GbE	SFP28	AFBR-8CERxxZ	25G AOC , xx=length in meters, supports 25G rate only
				AFBR-735SMZ	Dual rate 10G/25G-SR, 10G rate is power up default, Rate select pins or registers must be used to change rate
OCP 2.0	M150P BCM957414M4143C	1 x 50GbE	QSFP28	AFBR-89CDHZ	100G-SR4 (4x25G NRZ) (2x25G NRZ supported)
OCP 2.0	M150PM BCM957452M4520C	1 x 50GbE	QSFP28	AFBR-89CDHZ	100G-SR4 (4x25G NRZ) (2x25G NRZ supported)
OCP 2.0	M150G BCM957502-M150G	1x 50G	QSFP28	AFBR-89CDHZ	100G-SR4 (4x25G NRZ) (2x25G NRZ supported)
OCP 2.0	M1100G16 (1x16) BCM957504-M1100G16	1x 100G	QSFP28	AFBR-89CDHZ	100G-SR4 (4x25G NRZ)

Recommended Fiber Optic Transceivers for Ethernet NICs

Recommended Fiber Optic Transceivers for for OCP 3.0 Form Factor

Form Factor	Marketing Name Part Number	Ports	I/O	Fiber Optic Transceivers Part Number	Fiber Optic Transceivers Description
OCP 3.0	N210tp BCM957416N4160C	2x 10GBT	RJ45	N/A	N/A
OCP 3.0	N210p BCM957412N4120C	2x 10G	SFP+	N/A	10G-SR
OCP 3.0	N225p BCM957414N4140C	2x 25G	SFP28	AFBR-8CERxxZ	25G AOC , xx=length in meters, supports 25G rate only
				AFBR-735SMZ	Dual rate 10G/25G-SR, 10G rate is power up default, Rate select pins or registers must be used to change rate
OCP 3.0	N425G BCM957504-N425G	4x 25G	SFP28	AFBR-8CERxxZ	25G AOC , xx=length in meters, supports 25G rate only
				AFBR-735SMZ	Dual rate 10G/25G-SR, 10G rate is power up default, Rate select pins or registers must be used to change rate
OCP 3.0	N1100G BCM957504-N1100G	1x 100G	QSFP56	AFBR-89CDHZ	100G-SR4 (4x25G NRZ)
				AFBR-93CDDZ	200G-SR4 (4x50G PAM4) in development
OCP 3.0	N2100G BCM957508-N2100G	2x 100G	QSFP56	AFBR-89CDHZ	100G-SR4 (4x25G NRZ)
				AFBR-93CDDZ	200G-SR4 (4x50G PAM4) in development
OCP 3.0	N2200G BCM957508-N2200G	2 x 200GbE	QSFP56	AFBR-93CDDZ	200G-SR4 (4x50G PAM4) in development
OCP 3.0	N210tp BCM957416N4160C	2x 10GBT	RJ45	N/A	N/A

Fibre Channel HBAs

Emulex-branded Fibre Channel (FC) Host Bus Adapters (HBAs) by Broadcom are designed to address the demanding performance, reliability and management requirements of today's enterprises that are deploying low latency all- flash and NVMe networked storage arrays.

Emulex HBAs are available in Gen 7 (64/32GFC), Gen 6 (32/16GFC) and Gen 5 (16/8GFC) models. All HBAs are available in single, dual and quad-port configurations. The product line offers a variety of performance and feature options such as diagnostics and advanced security, and troubleshooting features to meet the needs of a wide range of enterprise applications.

With a common driver model supporting all Emulex HBAs for each operating system, upgrading to next generation Emulex HBAs guarantees seamless migration.

Additionally, Fibre Channel technology is backward compatible with the two previous generations. For example, Gen 6 (32GFC) Fibre Channel switches, HBAs and optics (transceivers) are backward compatible with 16GFC and 8GFC equipment. This provides a smooth upgrade path and investment protection for enterprises.

Emulex Fibre Channel HBA Portfolio

Models	Series	IOPS Per Single-Port	Bandwidth Per Single Port (read/write,	NVMe Over FC	Mission-Critical Features
Gen 7 32GFC	LPe35000	Up to 5M	6400MB/s	Yes	• 3x better latency than LPe31000/32000-series • Silicon Root of Trust: hardware-based firmware authentication • 128GFC Trunking • Easy performance upgrade from 32GFC to 64GFC with hot-plug optics kits1 • + features below
Gen 6 32GFC	LPe32000	1.6M	6400MB/s	Yes	• Forward Error Correction (FEC) • Secure Firmware Updates • Brocade® I/O Insight • ClearLink(D_port), Link Cable Beaconing, Host Name Registration, Read Diagnostic Parameters, VMID, BB_Credit Recovery, Fabric-assigned Boot LUN, Fabric- assigned PWWN, FC-Trace, FC-Ping, Rest APIs & more • T10-PI data integrity offload • OneCapture • Hot plug optics
Gen 6 16GFC	LPe32000	1.6M	3200MB/s	Yes	

Fibre Channel HBAs

Features

Feature	Description	PCIe 4.0 HBAs	PCIe 3.0 HBAs		
		LPe35000 LPe35002 LPe35004*	LPe32000 LPe32002 LPe32004	LPe31000 LPe31002 LPe31004	LPe16000B LPe16002B
Link speed support	4GFC			•	•
	8GFC	•	•	•	•
	16GFC	•	•	•	•
	32GFC	• Upgradeable to 64GFC1 (except 4-port model)	•	• Upgradeable to 32GFC (except 4 port model)	
Ports	Number of Fibre Channel connec- tions on one HBA	1, 2, 4	1, 2, 4	1, 2, 4	1, 2
Throughput per port (MB/s, full duplex)	Large block transfer speed	LPe35000: 6400 LPe35002: 12800 LPe35004: 25600	LPe32000: 6400 LPe32002: 12800 LPe32004: 25600	LPe31000: 3200 LPe31002: 6400 LPe31004: 12800	LPe16000B: 3200 LPe16002B: 6400
IOPS	Input/output operations per second per port	5M	1.6M (total)	1.6M (total)	1.2M (total)
PCIe bus		4.0	3.0	3.0	3.0
HBA port virtualization	N_Port ID Virtualization (NPIV)	•	•	•	•
NVMe over Fibre Channel (NVMe/FC)	Supports NVMe/FC and SCSI over FC concurrently.	•	•	•	
Buffer Credit Recovery (B2B credit recovery)	Maintains maximum perfor- mance between ports under marginal link conditions.	•	•	•	
Secure Firmware Updates (software-based solution)	Protects the integrity of firm- ware with compliance to NIST SP 800-193 standards		•	•	
Silicon Root of Trust (hard- ware-based solution)	Hardware-based protection against malicious firmware downloads. Complies to NIST SP 800-193 standards.	•			
Trunking (port aggregation)	Aggregates physical ports to form a single, logical, high- bandwidth port up to 128GFC.	•			
HBA Resources	Exchanges and logins	12,288	12,288	12,288	3,071 (1-port)/ 6,142 (2-port)
	Virtual functions	32	32	32	

Fibre Channel HBAs

Features

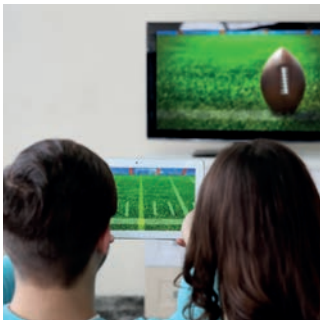
Feature	Description	PCIe 4.0 HBAs	PCIe 3.0 HBAs		
		LPe35000 LPe35002 LPe35004*	LPe32000 LPe32002 LPe32004	LPe31000 LPe31002 LPe31004	LPe16000B LPe16002B
Operating system	Windows	•	•	•	•
	Linux	•	•	•	•
	VMware	•	•	•	•
	Solaris	•	•	•	•
FC-Tape		FCP-4	FCP-4	FCP-4	FCP-4
All topologies	Auto detect — P To P; FC-AL; fabric	• No FC-AL	• No FC-AL	• No FC-AL	•
Host PCI slot compatibility	Short length (standard height)	•	•	•	•
	Low profile compatible	• 4-port is full-height	•	•	•
Media interface	LC multi-mode/short wave	•	•	•	•
	Digital diagnostics	•	•	•	•
	Long-wave optics (optional kits	•	•	•	•

Options

Part number	Description
LPe12100-OPT	8GFC spare optic (short wave laser with LC connector SFP+ optic) – 1 pack
LPe16100-OPT	16GFC optic (short wave laser with LC connector SFP+ optic) – 1 pack
LPe16100-OPTx2	16GFC optics (short wave laser with LC connector SFP+ optic) – 2 pack
LP16-LW-OPT-1	16GFC long wave optics (long wave laser with LC connector SFP+ optic) - 1 pack
LP16-LW-OPT-2	16GFC long wave optics (long wave laser with LC connector SFP+ optic) - 2 pack
LP32-SW-OPT-1	Gen 6 (32GFC) spare optic (short wave laser with LC connector SFP+ optic) – 1 pack
LP32-SW-OPT-2	Gen 6 (32GFC) spare optic (short wave laser with LC connector SFP+ optic) – 2 pack
LP32-LW-OPT-1	32GFC long wave optic (long wave laser with LC connector SFP+ optic) - 1 pack
LP32-LW-OPT-2	32GFC long wave optic (long wave laser with LC connector SFP+ optic) - 2 pack

Connecting everything®




Broadcom Inc. is a global infrastructure technology leader built on 50 years of innovation, collaboration and engineering excellence.

Broadcom Inc. (NASDAQ: AVGO) is a global technology leader that designs, develops and supplies a broad range of semiconductor and infrastructure software solutions. Broadcom's category-leading product portfolio serves critical markets including data center, networking, enter-prise software, broadband, wireless, storage and industrial. Our solutions include data center networking and storage, enterprise, mainframe and cyber security software focused on automation, monitoring and security, smartphone components, telecoms and factory automation.

BROADCOM®
connecting everything®

For more product information: broadcom.com/products/storage