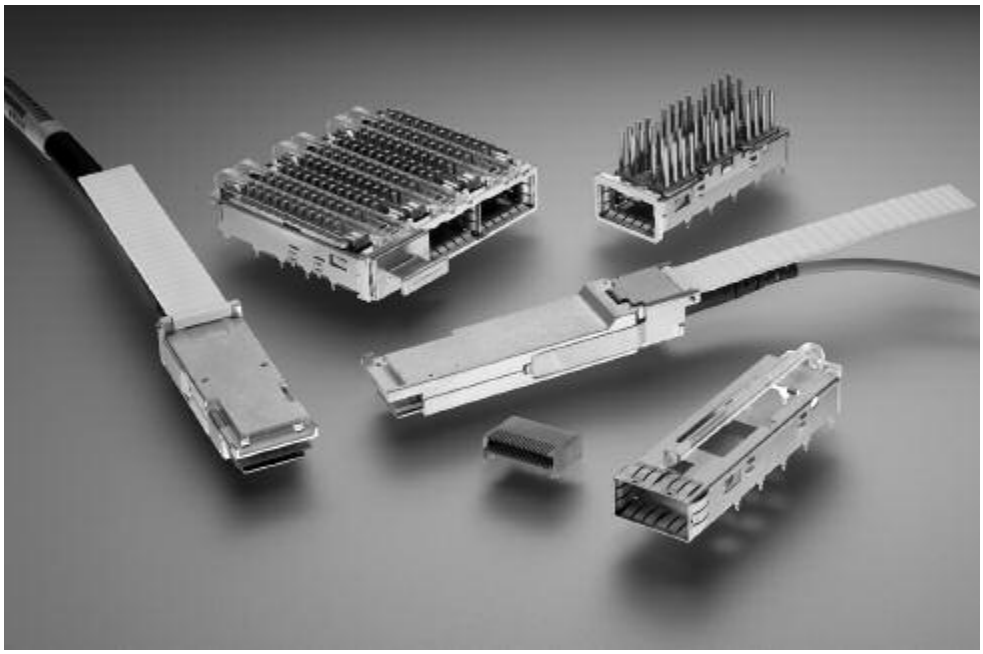
QSFP (Quad Small Form-factor Pluggable) Products

Applications

- Switches
- Routers
- Host bus adapters
- Enterprise storage
- High performance computing



The Quad Small Form-factor Pluggable (QSFP) product line from TE Connectivity (TE) is a four-channel package, offering 3 times the density of traditional SFP ports and now supports speeds up to more than 25Gb/s per channel to support the new 100 Gbps Ethernet and 100 Gbps InfiniBand Enhanced Data Rate applications. The QSFP product lines include zQSFP, and QSFP/QSFP+ products that feature cages, connectors, and copper and optical cable assemblies developed within the QSFP MSA (Multi-Source Agreement).

Catalog 1773408-1
Revised 5-12

www.te.com

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QSFP+ Copper Cable Assemblies

Product Facts

- QDR (10Gbps/lane) data rates
- Compatible with industry standard QSFP cages
- EEPROM signature which can be customized
- Pull tab unlatching allows compact belly to belly application
- 360 degree cable braid crimp suppresses EMI
- Uses MADISON CABLE brand TURBOTWIN copper cable

Applications

- Switches, routers and host bus adapters (HBA's)
- Enterprise storage
- High density I/O's
- Multiple channel interconnects



TE is a developer of Quad Small Form Factor Pluggable (QSFP+) high speed, high performance cable assemblies. The QSFP+ assembly offers 4 channels of data, providing 3 times the density of SFP/SFP+ ports. QSFP+ cable assemblies can support data rates up to 10Gbps per differential pair, and support Fibre Channel, Ethernet and InfiniBand standards.

Part Number	Description	AWG	Length
2053638-1	QSFP+ to QSFP+ Passive	30	1m
2053638-2	QSFP+ to QSFP+ Passive	30	2m
2053638-3	QSFP+ to QSFP+ Passive	30	3m
2053638-4	QSFP+ to QSFP+ Passive	28	4m
2053638-5	QSFP+ to QSFP+ Passive	26	5m
1-2053638-6	QSFP+ to QSFP+ Passive	30	0.5m
2053453-1	QSFP+ to [4] SFP+ Passive	30	0.5m
2053453-2	QSFP+ to [4] SFP+ Passive	30	1m
2053453-3	QSFP+ to [4] SFP+ Passive	30	2m
2053453-4	QSFP+ to [4] SFP+ Passive	30	3m
2053453-5	QSFP+ to [4] SFP+ Passive	28	4m
2053453-6	QSFP+ to [4] SFP+ Passive	26	5m

Fibre Channel is a trademark of the Fibre Channel Industry Association.
INFINIBAND is a trademark of the InfiniBand Trade Association.

Note: All part numbers are RoHS compliant.

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China: +86 (0) 400-820-6015

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QSFP/QSFP+ Products

Product Facts

- **4x solution featuring TE 38 position EVERCLEAR connector**
- **Lightpipe and heat sink options available**
- **Through-bezel and behind-bezel cage options with proven EMI containment**
- **Direct attach copper cables for short reach applications**
- **Quick release latching system**
- **MPO connectors plug into QSFP parallel optic transceiver modules**

Applications

- **Switches, routers, and host bus adapters (HBA's)**
- **Enterprise storage**
- **High density, high speed I/O**
- **Multiple channel interconnects**



QSFP cages and connectors are designed for data rates up to 10 Gb/s per channel, supporting Fibre Channel, Ethernet, SDH/SONET, and InfiniBand standards. The cage/connector system will accept optical or copper interfaces.

The QSFP product line includes cages in single and ganged configurations with various heat sink and lightpipe options. The connector is a 38 position high speed SMT connector and EMI plugs are offered for empty ports. Cabling options include direct attach copper cable assemblies, active optical assemblies and MPO optical cable assemblies that plug into a QSFP transceiver module.

Technical Documents

Product Specification
108-2286

Industry Standard
SFF-8436

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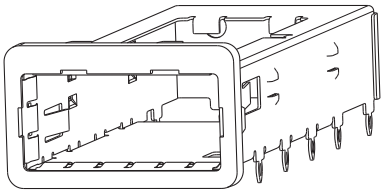
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QSFP Cages and Connectors

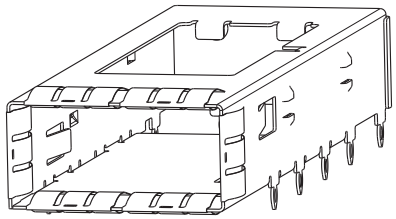
Cages

- Reliable springs and gasket designs for EMI containment
- Single and dual lightpipe options
- Riding heat sinks for thermal dissipation, various pin heights available
- Belly-to-belly compatible (double-sided PCB's)
- Press-fit termination
- Port-to port spacing — 21.0 mm (through-bezel)/ 23.5 mm (behind-bezel)
- Behind bezel design eliminates potential for mismating plug
- Rugged stops to prevent over insertion of module

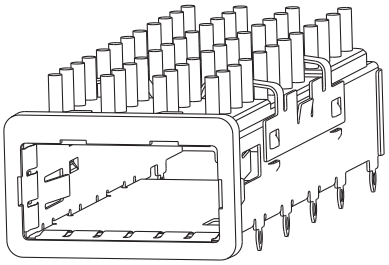




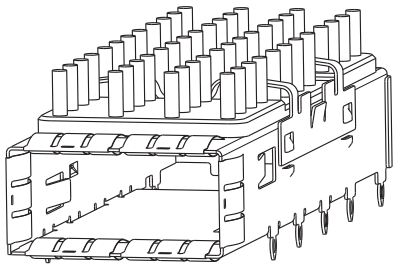
Behind-Bezel Cage



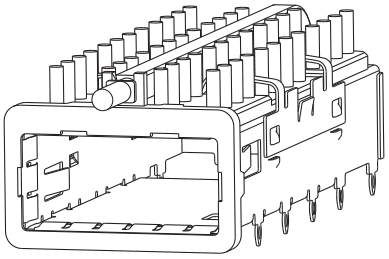
Through-Bezel Cage



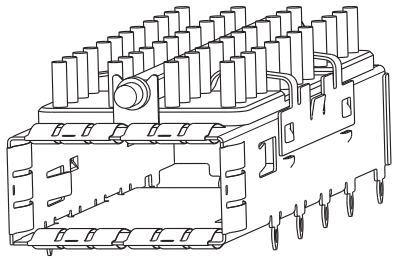
Behind-Bezel Cage with Heat Sink



Through-Bezel Cage with Heat Sink



Behind-Bezel Cage with Heat Sink and Lightpipe



Through-Bezel Cage with Heat Sink and Lightpipe

QSFP Cage Kits

Part Number	Bezel Mount	Heat Sink	Max. Height	Lightpipe
1888617-1	Through-bezel	None	—	None
1888674-1	Through-bezel	None	—	Customer Applied
1888631-1	Through-bezel	PCI	13.7 mm	None
1888631-2	Through-bezel	SAN	16.0 mm	None
1888631-3	Through-bezel	Networking	23.0 mm	None
1888971-1	Through-bezel	SAN	16.0 mm	Dual Lightpipe
1888971-2	Through-bezel	Networking	23.0 mm	Dual Lightpipe
1888971-3	Through-bezel	PCI	13.7 mm	Dual Lightpipe
1888972-1	Through-bezel	SAN	16.0 mm	Single Lightpipe
1888972-2	Through-bezel	Networking	23.0 mm	Single Lightpipe
1888972-3	Through-bezel	PCI	13.7 mm	Single Lightpipe
1888781-1	Behind-bezel	None	—	None
1888968-1	Behind-bezel	PCI	13.7 mm	None
1888968-2	Behind-bezel	SAN	16.0 mm	None
1888968-3	Behind-bezel	Networking	23.0 mm	None
2110487-1*	Through-bezel	No	Closed Top	None

*Solder

Accessories

Part Number	Description
1888634-1	Single Lightpipe
2007309-1	Dual Lightpipe
2007304-1	Heat Sink Clip

Note: All part numbers are RoHS compliant.

Catalog 1773408-1
Revised 5-12

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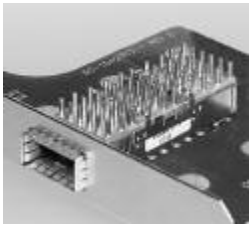
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QSFP Cages and Connectors (Continued)

Cages (Continued)

Cage Applications:



Through Bezel



Behind Bezel



Ganged QSFP Cages Behind Bezel

Part Number	Configuration	Heat Sink	Max. Height of Heat Sink Above Board	Lightpipe
2057042-1	1x3	PCI	13.7 mm	Included
2057042-2	1x3	SAN	16.0 mm	Included
2057042-3	1x3	Networking	23.0 mm	Included
2007456-1	1x3	PCI	13.7 mm	None
2007456-2	1x3	San	16.0 mm	None
2007456-3	1x3	Networking	23.0 mm	None
2007473-1	1x3	None	—	Option for lightpipe attachment*
2007474-1	1x3	None	—	None
2057183-1	1x4	PCI	13.7 mm	Included
2057183-2	1x4	SAN	16.0 mm	Included
2057183-3	1x4	Networking	23.0 mm	Included
2007625-1	1x4	PCI	13.7 mm	None
2007625-2	1x4	SAN	16.0 mm	None
2007625-3	1x4	Networking	23.0 mm	None
2007668-1	1x4	None	—	Option for lightpipe attachment*
2007667-1	1x4	None	—	None
2143330-1	1x6	PCI	13.7 mm	none
2143330-2	1x6	SAN	16.0 mm	none
2143330-3	1x6	Networking	23.0 mm	none
2143331-1	1x6	PCI	13.7 mm	included**
2143331-2	1x6	SAN	16.0 mm	included**
2143331-3	1x6	Networking	23.0 mm	included**

* Sold separately ** Square profile

Ganged QSFP Cages Through-bezel

2170024-1	1x4	no	Closed top	none

Dual Lightpipe

Part Number	Recommended LED Height
2007477-3	0.8 – 1.1 mm

Note: Other lightpipe options available.

Connector Part Number 1761987-9 and 2110819-1

- **Tape and reel packaged for pick and place SMT processing**
- **38 position EVERCLEAR connector**
- **Designed to optimize signal integrity through 10 Gb/s**

Part Number	Configuration	Remarks
2110819-1	38 pos	Provides extra margin at 10 Gb applications and support for 14 Gb IB

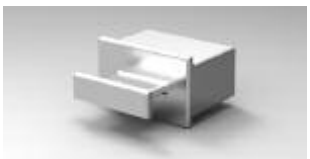






EMI/Dust Plug Part Number 1888810-2

- **Provides EMI containment for unused ports**
- **Keeps interface free of contamination or debris**
- **Ergonomic Design**



PCI is a trademark of PCI-SIG.

Note: All part numbers are RoHS compliant.

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MPO Optical Connectors and Cable Assemblies

QSFP Optical Jumper

- Uses 50/125µm MM fiber (500MHz-km BW at 850nm and 1300nm wavelengths) with OFNR-rated jacket
- Fiber path is reversed (1 to 12, 2 to 11, 3 to 10, 4 to 9, fibers 5, 6, 7, 8 not used)

Other options include

- Custom lengths
- High bandwidth cable (up to 2000MHz-km)
- OFNP rated jacket
- Fanout to LC for interface to SFP optical ports



MPO to MPO Suitable for Interface to Transceiver

Part Number	Standard Length
1938208-1	1 m
1938208-5	5 m
1-1938208-0	10 m
2-1938208-0	20 m
5-1938208-0	50 m

Note: See drawing for part numbers of other standard lengths.

Note: All part numbers are RoHS compliant.

Catalog 1773408-1
Revised 5-12

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Generation II PARALIGHT QSFP+ Active Optical Cable Assemblies

Applications

- High performance computing clusters
- Supercomputers
- High end servers
- Mass storage
- Metro network switch/cross connect
- High end carrier class routers
- SDR, DDR, and QDR InfiniBand applications
- Other 2.5–10.0 Gb/s applications (e.g. 10 Gb Fibre Channel ISL or 10 Gig Ethernet XAUI on ports providing InfiniBand pinout 3.3 V power)

Optical/Electrical

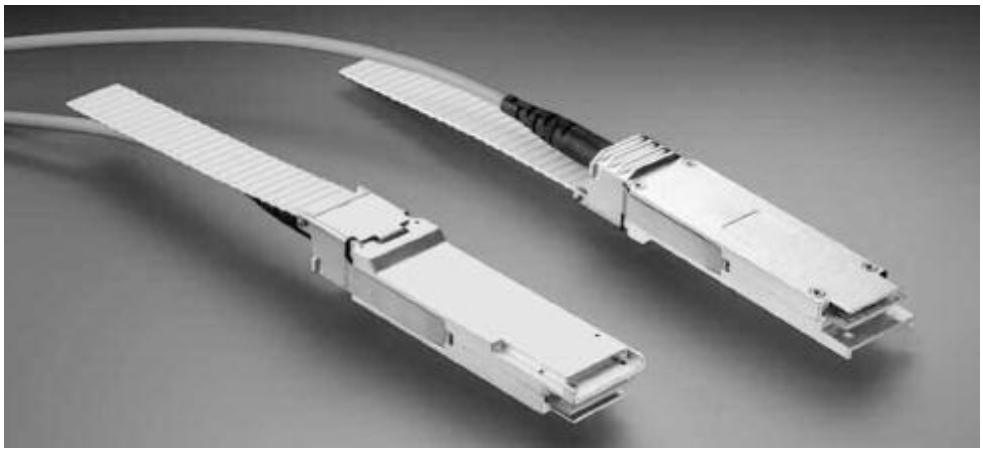
- 40 Gb/s bidirectional
- Compatible with SDR, DDR, and QDR InfiniBand applications
- Low power consumption — under 1 watt per end

Mechanical/Environmental

- Up to 100 meters
- 25 mm bend radius
- Operating temperature 0°C to 70°C
- Storage temperature -20°C to 85°C
- 4 channels each direction

Materials

- OFNP/CSA-FT-6 (plenum) cable
- OFN-LS (LSZH rated) cable available upon request



Length (Meters)	Cable Type	10 Gb/s QSFP-QSFP
1	OFNP*	1-2123287-2
2	OFNP*	2123287-1
3	OFNP*	2123287-2
5	OFNP*	2123287-3
7	OFNP*	1-2123287-3
10	OFNP*	2123287-4
15	OFNP*	2123287-5
20	OFNP*	2123287-6
25	OFNP*	2123287-7
30	OFNP*	2123287-8
40	OFNP*	2123287-9
50	OFNP*	1-2123287-0
100	OFNP*	1-2123287-1

*OFNP = Optical Fiber Nonconductive Plenum

Fibre Channel is a trademark of the Fibre Channel Industry Association.

INFINIBAND is a trademark of the InfiniBand Trade Association.

XAUI is a trademark of the 10Gigabit Ethernet Alliance XAUI Interoperability Group.

Note: All part numbers are RoHS compliant.

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56 Gb/s QSFP+ Active Optical Cable Assemblies

Applications

- High performance computing clusters
- Supercomputers
- High end servers
- Mass storage
- Metro network switch/cross connect
- High end carrier class routers
- SDR, DDR, QDR, and FDR InfiniBand applications
- Other 2.4–14.1 Gb/s Applications (e.g. 10 Gb Fibre Channel or 10 Gig Ethernet XAUI on ports providing InfiniBand pinout 3.3 V power)

Optical/Electrical

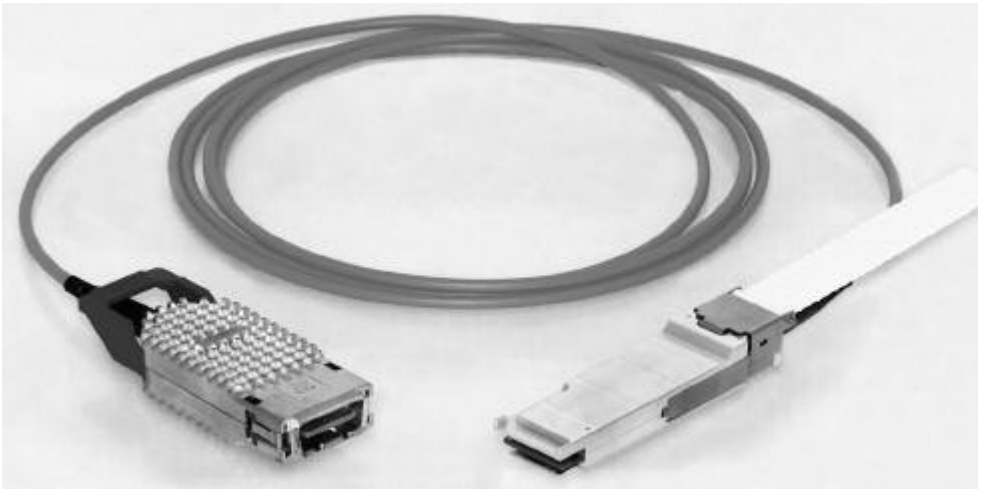
- 56 Gb/s bidirectional
- Compatible with SDR, DDR, QDR, and FDR InfiniBand applications
- Low power consumption — under 1 watt per end

Mechanical/Environmental

- Up to 100 meters
- 25 mm bend radius
- Operating temperature 0°C to 70°C
- Storage temperature -20°C to 85°C
- 4 channels each direction

Materials

- OFNP/CSA-FT-6 (plenum) cable
- OFN-LS (LSZH rated) cable available upon request



Length (Meters)	Cable Type	14 Gb/s QSFP-QSFP
3	OFNP*	2123541-2
5	OFNP*	2123541-3
7	OFNP*	1-2123541-3
10	OFNP*	2123541-4
15	OFNP*	2123541-5
20	OFNP*	2123541-6
25	OFNP*	2123541-7
30	OFNP*	2123541-8
40	OFNP*	2123541-9
50	OFNP*	1-2123541-0
100	OFNP*	1-2123541-1

*OFNP = Optical Fiber Nonconductive Plenum

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XAUI is a trademark of the 10Gigabit Ethernet Alliance XAUI Interoperability Group.

Note: All part numbers are RoHS compliant.

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40 Gb/s QSFP+ Optical Transceiver

Applications

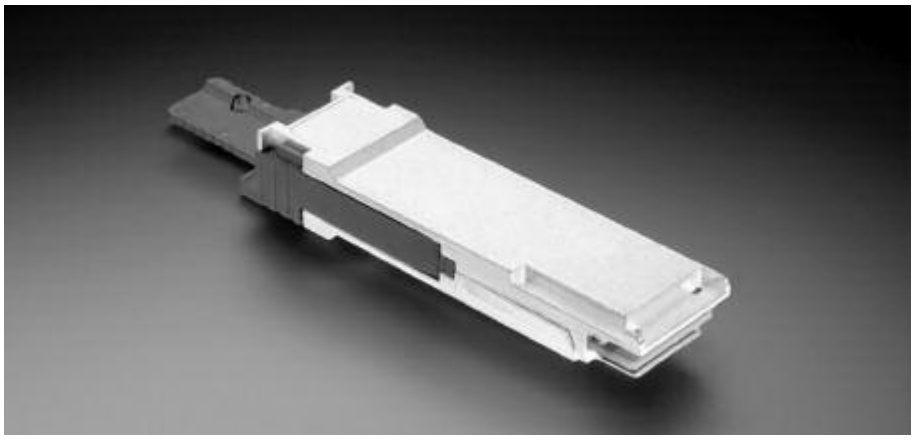
- High-speed interconnects within and between switches, routers and transport equipment
- Server-Server Clusters, Super-computing interconnections
- Proprietary backplanes
- Interconnects rack-to-rack, shelf-to-shelf, board-to-board, board-to-optical backplane
- 10GBASE-SR applications
- 40GBASE-SR4 applications
- InfiniBand SDR, DDR and QDR applications

Optical/Electrical

- 40 Gb/s bidirectional
- Compatible with SDR, DDR, QDR, and FDR InfiniBand applications and Ethernet 10GBASE-SR and 40GBASE-SR4
- Low power consumption — typical power under 1 watt

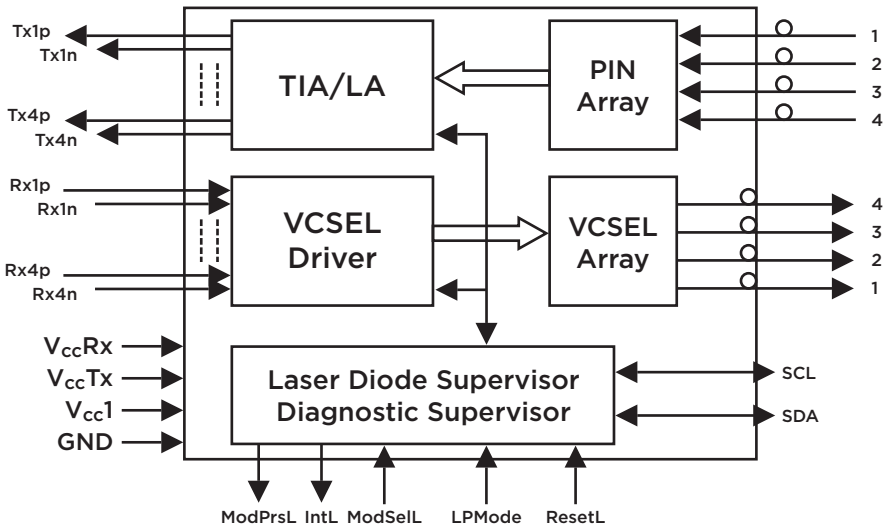
Mechanical/Environmental

- Operating temperature 0°C to 70°C
- Storage temperature -20°C to 85°C
- 4 channels each direction



Part Number	Description
2156043-1	40 Gb/s QSFP+ Transceiver (4 channels x 10.3125 Gbps)

Block Diagram



INFINIBAND is a trademark of the InfiniBand Trade Association.

Note: All part numbers are RoHS compliant.

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