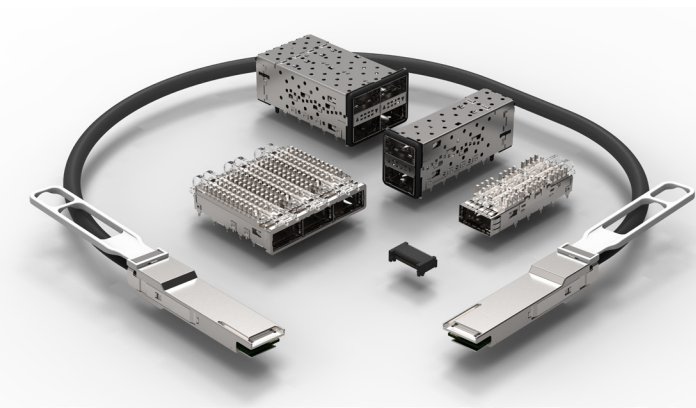# QSFP+ CONNECTORS AND CAGES

Quick Reference Guide

TE
connectivity

Introducing QSFP+ Family

QSFP (or quad SFP) connectors provide four channels of data in one pluggable interface. Each channel is capable of transferring data up to 14 Gbps, supporting a total of 56 Gbps. These interconnects have 3x the density of SFP+ interconnects. The QSFP product family includes cages in single and ganged configurations with various heat sink and lightpipe options. The connector is a 38-position, high-speed SMT connector. EMI plugs are offered for empty ports.

TE Connectivity offers PARALIGHT active optical QSFP+ cable assemblies, which eliminate the need for a separate transceiver and optical interface. The QSFP+ direct attach copper cable assemblies are a high-speed and cost-effective alternative to fiber optics in short-reach 10Gb Ethernet and 14Gb Infini-Band FDR applications. These assemblies enable hardware OEMs and data center operators to achieve higher port density and configurability at a low cost while reducing the power requirement.

Features and Benefits

Interconnect

- 4-channels in one interface, providing 3 to 4x
  density of, SFP+ and XFP
- Meets QSFP+ 10 Gbps Ethernet and 14 Gbps InfiniBand requirements
  (total 40- and 56-Gbps interface)
- Uses 38-position SMT connector
- Cages offered in single port and ganged configurations
- 2x1 and 2x2 stacked assemblies also available
- Cages accommodate belly-to-belly mounting
- Heat sinks and lightpipes available

Cable Assemblies

- Direct attach copper and PARALIGHT optical cable assemblies offered
- MSA compliant
- Supports data rates up to 10 and 14 Gbps per channel (40 Gbps aggregate)
- Low power consumption
- Enhanced EMI suppression
- Pull-to-release slide latch design
- Passive and active assemblies

Applications

Product Applications

- Storage
- Servers
- Networking
- Switches, routers and hubs
- Network Interface Cards (NICs)
- Telecommunication equipment

Applications by Protocol

- 10 Gigabit and 40G Ethernet
- InfiniBand:
- SDR (2.5 Gbps)
- DDR (5 Gbps)
- QDR (10 Gbps)
- FDR (14 Gbps)
- Serial attached SCSI (SAS)

38 Position SMT Connector

Part Number	Description
1761987-9	Standard QSFP Connector
2110819-1	Enhanced QSFP+ Connector

Behind Bezel Gaskets

Part Number	Description
2132186-1	1x1
2132187-1	1x3
2132188-1	1x4

Lightpipes

Part Number	Description
1888634-1	Single Round LP for thru bezel cages
2170022-1	Single Square LP for behind bezel cages
2007309-1	Dual Round lightpipe for Thru Bezel Cages
2007477-X	Dual Round lightpipe for Behind Bezel Cages
2057121-1	Dual Square lightpipe for Behind Bezel Cages

Cages

Base Number	Ports	Cage Applications	EMI Supresson	Lightpipes Applied Per Port			Heatsinks Applied		
				Single	Dual	Quad	Networking	PCI	SAN
1888781	1x1	Behind Bezel	C	No	No	No	No	No	No
1888968	1x1	Behind Bezel	C	No	No	No	Yes	Yes	Yes
2170112	1x1	Behind Bezel	C	No	Yes	No	Yes	Yes	Yes
2170539	1x1	Through Bezel	EMI Gasket	No	No	Yes	Yes	Yes	Yes
1888617	1x1	Through Bezel	EMI Springs	No	No	No	No	No	No
2110487	1x1	Through Bezel	EMI Springs	No	No	No	Closed Top	Closed Top	Closed Top
1888674	1x1	Through Bezel	EMI Springs	C	C	C	No	No	No
1888631	1x1	Through Bezel	EMI Springs	No	No	No	Yes	Yes	Yes
1888971	1x1	Through Bezel	EMI Springs	No	Yes	No	Yes	Yes	Yes
1888972	1x1	Through Bezel	EMI Springs	Yes	No	No	Yes	Yes	Yes
*2170519	1x1	Through Bezel	EMI Springs	No	No	No	No	No	No
*2170536	1x1	Through Bezel	EMI Springs	No	No	No	Yes	Yes	Yes
**2170322	1x1	Through Bezel	EMI Springs	No	No	No	Closed Top	Closed Top	Closed Top
2007456	1x3	Behind Bezel	C	No	No	No	Yes	Yes	Yes
2007473	1x3	Behind Bezel	C	C	C	C	No	No	No
2057042	1x3	Behind Bezel	C	No	Yes	No	Yes	Yes	Yes
2110412	1x3	Behind Bezel	C	No	Yes	No	Yes	Yes	Yes
2170037	1x3	Behind Bezel	C	Yes	No	No	Yes	Yes	Yes
2174769	1x3	Behind Bezel	EMI Gasket	No	No	No	Yes	Yes	Yes
2170507	1x3	Through Bezel	EMI Gasket	No	No	Yes	Yes	Yes	Yes
2007667	1x4	Behind Bezel	C	No	No	No	No	No	No
2007668	1x4	Behind Bezel	C	C	C	C	No	No	No
2007625	1x4	Behind Bezel	C	No	No	No	Yes	Yes	Yes
2007626	1x4	Behind Bezel	C	No	Yes	No	Yes	Yes	Yes
2170567	1x4	Behind Bezel	C	No	Yes	No	Yes	Yes	Yes
2174754	1x4	Behind Bezel	EMI Gasket	No	No	No	Yes	Yes	Yes
2170288	1x4	Through Bezel	EMI Gasket	No	No	No	No	No	No
2170287	1x4	Through Bezel	EMI Gasket	No	No	No	Yes	Yes	Yes
2170525	1x4	Through Bezel	EMI Springs	No	No	No	No	No	No

C stands for Customer Applied Gasket

1xN cages: require a SMT connector to complete the assembly

2xN cages: connectors and cages come as one integrated assembly

Heatsink Max Height off of PCB: Networking (23mm), SAN (16mm), PCI (13.7mm)

All cages use EMI Plug 1888810-2

*Rear tails removed

**Enhanced EMI Protection + solder tail

Cages

Base Number	Ports	Cage Applications	EMI Supresson	Lightpipes Applied Per Port			Heatsinks Applied		
				Single	**Dual**	**Quad**	**Networking**	**PCI**	**SAN**
2170024	1x4	Through Bezel	EMI Springs	No	No	No	Closed Top	Closed Top	Closed Top
2170377	1x4	Through Bezel	EMI Springs	No	No	No	No	Yes	Yes
2170378	1x14	Through Bezel	EMI Springs	No	Yes	No	Yes	No	No
2143329	1x6	Behind Bezel	C	No	No	No	No	No	No
2143330	1x6	Behind Bezel	C	No	No	No	Yes	Yes	Yes
2143307	1x6	Behind Bezel	C	No	Yes	No	Yes	Yes	Yes
2143331	1x6	Behind Bezel	C	No	Square	No	Yes	Yes	Yes
2170023	1x6	Behind Bezel	C	Yes	No	No	Yes	Yes	Yes
2170207	1x6	Through Bezel	EMI Gasket	No	No	No	Yes	Yes	Yes
2085945	2x1	Through Bezel	EMI Gasket	Yes	Yes	No	No	No	No
2214574	2x2	Through Bezel	EMI Gasket	Yes	Yes	No	No	No	No

C stands for Customer Applied Gasket

1xN cages: require a SMT connector to complete the assembly

2xN cages: connectors and cages come as one integrated assembly

Heatsink Max Height off of PCB: Networking (23mm), SAN (16mm), PCI (13.7mm)

All cages use EMI Plug 1888810-2

*Rear tails removed

**Enhanced EMI Protection + solder tail

Related Cable Assemblies

Direct Attach Copper Cable Assemblies

P/N	Description	AWG	Dash to Length (meters)					
			0.5	1	2	3	4	5
2074739	DDR (5Gbps) Passive	26~30	-1	-2	-3	-4	-5	-6
2015234	QDR (10Gbps) Passive	26~30	-9	-1	-2	-3	-4	-5
2053638	QDR (10Gbps) Unequalized Passive	26~30	-16	-1	-2	-3	-4	-5
2074119	DDR QSFP to Hybrid Cable	26~30	-1	-2	-3	-4	-5	-7

Cable Assembly Features and Benefits

- Pull tab unlatching allows compact belly-to-belly application

- 360 degree cable braid crimp supresses EMI

- Uses MADISON CABLE brand TurboTwin copper cable

- Hybrid and breakout cables available : ie, QSFP to 4xIB, QSFP to SFP+

QSFP/QSFP+ PARALIGHT Active Optical Cable Assemblies

Base Part Number	Description	Cable Type	Meters (x represents base number shown on the left)									
			3	5	7	10	15	20	30	40	50	100
2123603	InfiniBand FDR 56 Gb/s	OFNP*	x-2	x-3	1- x -3	x-4	x-5	x-6	x-8	x-8	1- x -0	1- x -1
2123909	Ethernet 40 GBASE-SR4	OFNP*	x-2	x-3	1 - x -3	x-4	x-5	x-6	x-8	x-9	1- x -0	1- x -1

X represents base number. For specific part numbers add an extension number (-2 or -6) to the base number. For example, for 3 meter InfiniBand FDR 56 Gb/s cable, part number is 2123603-2. For 50 meter Ethernet 40 GBASE-SR4 the number is 1-2123909-0.

*OFNP = Optical Fiber Nonconductive Plenum (Also known as CX4 and SFF-8470)   **Note : Longer lengths available upon request.**

25mm bend radius

Passive Fiber Cable Assemblies

P/N	Description	Cable Type
2148448		OM4
1938323	MPO (no pins) QSFP	OM3
1938208		OM2

Frequently asked Questions

What data rate does QSFP+ support?

QSFP+ supports up to 10 Gbps per channel Ethernet (40G total) and 14 Gbps per channel InfiniBand (56 Gbps total).

Is TE's footprint compatible with other suppliers?

The single port cages are designed to industry standards. The ganged versions are not compatible with all sources.

Are heat sinks available?

Yes, TE offers a generous portfolio of heatsink heights and styles, as well as custom heatsinks upon request.

Is application tooling required?

Single port cage assemblies require only flat-rock tooling, while ganged assemblies require specific application tooling.

Does the application follow the performance requirements of SFF-8436?

TE's QSFP+ copper passive and active cable assemblies meet signal integrity requirements defined by industry standard SFF-8436. A fundamental requirement is the data rate as these cables are engineered for DDR and/or QDR data rates.

We can also custom engineer cable assemblies to meet a specific system requirements.

Are passive or active cable assemblies required?

Passive cables have no signal amplification in the assembly and rely on host system Electronic Dispersion Compensation (EDC) for signal amplification/equalization. Active cable assemblies have signal amplification and equalization built into the assembly and typically used in host systems that do not employ EDC.

If passive cables are needed, is equalization required?

Equalization is the process of reducing distortion over a transmission path by using compensating devices (resistors, capacitors, etc). These equalizers are added to the cable plug PCB and act as filters to improve the cable assembly's frequency response. These filters reduce jitter and open the cable's eye pattern.

What cable lengths are required?

Cable length and wire gauge are related to the performance characteristics of the cable assembly. Longer cable lengths require heavier wire gauge, while shorter lengths can use a smaller gauge cable. Smaller gauge cable assemblies provide many benefits to the data center operator, such as ease of routing, less weight and increased airflow. TE offers QSFP/QSFP+ cable assemblies in wire gauges #26 through #33 to support customers' specific cable routing requirements.

Are there other special customer requirements?

Examples of special requirements include custom cable lengths, EEPROM programming, labeling and packaging. We can custom engineer cables to specific customer system architecture.

For More Information

TE Technical Support Center

USA:	1.800.522.6752
Canada:	1 .905.475.6222
Mexico:	52.0.55.1106.0800
Latin/S. America:	54.0.11.4733.2200
Germany:	49.0.6251.133.1999
UK:	44.0.800.267666
France:	33.0.1.3420.8686
Netherlands:	31.0.73.6246.999
China:	86.0.400.820.6015

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TE
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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.