

The QSFP+ connector, cage and cable assemblies (copper and optical) and loopbacks are part of a highly-integrated system that combines effective use of space, power and port density for high-density applications; industry-leading Active Optical Cables (AOCs) from Molex achieve 40 Gbps data rates over long reaches up to 4km, using a fraction of the power of other brands

Molex's Quad Small Form-factor Pluggable Plus (QSFP+) solution is designed for high-density applications. QSFP has evolved to QSFP+ (meets 10 Gbps data rate) just as SFP went to SFP+ for 10 Gbps rate. The original QSFP MSA has been superseded by the SFF-8436 specification. Molex products comply with those defined in SFF-8436.

The SFF-8436 document specifies a transceiver mechanical form factor with latching mechanism, hostboard electrical-edge connector and cage. The hotpluggable transceiver integrates 4 transmit and 4 receive channels. Molex's QSFP+ transceiver (cable plug) can replace up to 4 standard SFP+ transceivers. The result is greater port density and overall system cost savings over traditional SFP+ products. Components of the QSFP+ system include the Electro Magnetic Interference (EMI) shielding cages (74750, 74768, 74769, 74783), 38-circuit iPass™ SMT host connectors (75586); stacked integrated connectors and cages (76870, 76871); 7 Gbps copper passive cable assemblies (74757), 10 Gbps copper passive cable assemblies (111040), copper active cable assemblies (74758), Active Optical Cables (AOCs) (Series 106410), optical pluggable cable assemblies (106283); copper loopback adapters (74763) and optical loopback adapters (106005).

Molex's QSFP+ cable assemblies are designed to accommodate stacked and ganged connector configurations in extremely high-density requirements. They will support 10G Ethernet, Fibre Channel, InfiniBand*, SAS and SONET/SDH standards with different data rate options.

Active Optical Cable (AOCs) extremely low power consumption of only 0.78W per cable end improves overall data center power consumption and thermal efficiency. AOCs reduced cable bulk compared to larger diameter copper cabling enable deployment of additional ports for increased number of AOCs per system, resulting in more connectivity options and total system cost savings. Four bi-directional optical data links per end each operate at data rates from 1.0 to 10.3125 Gbps and are compatible with multiple protocols including InfiniBand single data rates (SDR), dual data rates (DDR) and quad data rates (QDR), Ethernet systems (10 and 40 Gbps), Fibre Channel (8 and 10 Gbps), SAS (6 Gbps).

The optical QSFP+ MTP† pluggable cable assemblies and loopbacks meet the QSFP+ interface specification. QSFP+ cable assemblies provide improved fiber management in the chassis. Loopbacks feature a compact housing compatible with module spacing and loop optical transmit ports to receive ports for testing, burn-in and field troubleshooting.

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

- 75586
- 38-Circuit SMT iPass™ Host Connectors
- 74750, 74768, 74769, 74783
- EMI Cage Components
- 76870
- Stacked Integrated
- 76871
- Connectors and Cages
- 74757
- QSFP 7 Gbps Passive Copper Patch Cable Assemblies
- 111040
- QSFP+ 10 Gbps Passive Copper Patch Cable Assemblies
- 106410
- Active Optical Cables (AOC)
- 106283
- Optical MTP† Cable Assemblies
- 74763
- Copper Loopback Adapters
- 106005
- Optical MTP Loopback Adapters



Quad Small Form-factor Pluggable Plus (QSFP+) Solution



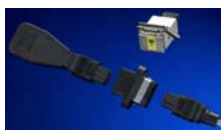
38-Circuit SMT iPass™ Host Connector (Series 75586)



2-by-1 Stacked Integrated Connector and Cage (Series 76871)



2-by-3 Stacked Integrated Connector and Cage (Series 76870)



QSFP+ Optical MTP Loopback Assembly (Series 106005)



Optical Cable Assembly (Series 106283)



Passive Copper Patch Cable Assembly (Series 74757, 111040)



QSFP+ EMI Cages (Left Cage shows EMI Gasket) (Series 74750, 74768, 74769, 74783)



Copper Loopback Adapter (Series 74763)



QSFP+ Active Optical Cable (Series 106410)

*InfiniBand is a registered trademark of the InfiniBand Trade Association

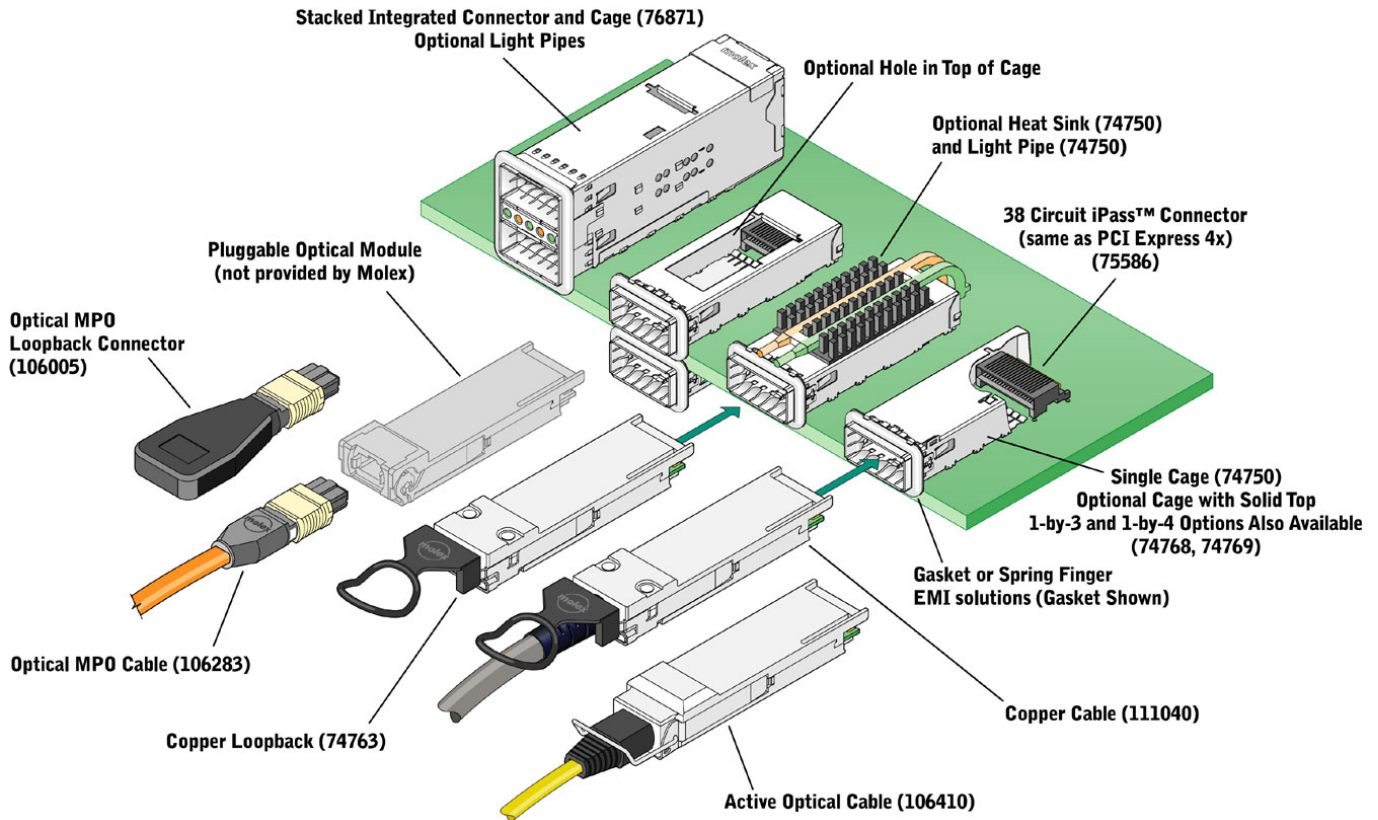
†MTP is a registered trademark of US Conec Ltd.

MARKETS AND APPLICATIONS

- Switches
- Routers
- Hubs
- SAN, NIC cards
- Host Bus Adapters (HBAs)

molex

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution



QSFP+ uses a standard 38-circuit iPass™ SMT host connector with a proven mating interface that enables high durability for high-density, high-bandwidth applications

The Molex 38-circuit iPass™ SMT host connector mounts on a PCB beneath a low-profile metal cage and is engineered to make connection to a variety of industry standard modules.

The proven iPass contact design, as seen in other architectures such as PCIe, SAS, SATA, Fibre Channel, Ethernet and InfiniBand*, provides a balanced differential channel featuring class-leading isolation, common-mode rejection and high bandwidth with a durability up to 250 cycles.

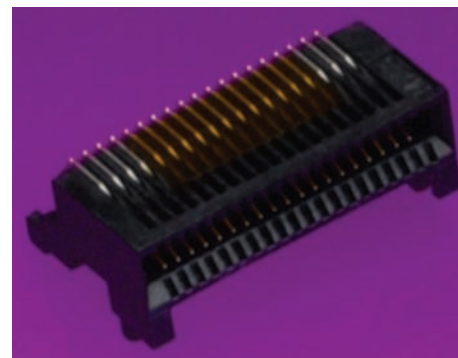
Molex's QSFP+ interface provides a high-density, high-bandwidth, cost-effective solution for a multitude of markets and applications including switches, routers, HBAs, enterprise data centers, high-performance computing (HPC) and storage.

FEATURES AND BENEFITS

- 0.80mm (.315") pitch host connector designed for placement beneath an EMI cage is ideal for pluggable applications
- Alignment posts provide stability for placement on the PCB
- High-temperature thermoplastic housing withstands lead-free processing
- SMT design allows for ease of routing and provides the option for placement on both sides of PCB
- Standoffs allow for easy PCB cleaning after soldering

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

75586 38-Circuit SMT iPass™ Host Connectors



38-Circuit SMT iPass™ Host Connector

SPECIFICATIONS

Reference Information

Packaging: Tape and Reel
 UL File No.: E29179
 CSA File No.: LR19980
 Mates With: 74757, 74763
 Use With: 74750
 Designed In: Millimeters

Electrical

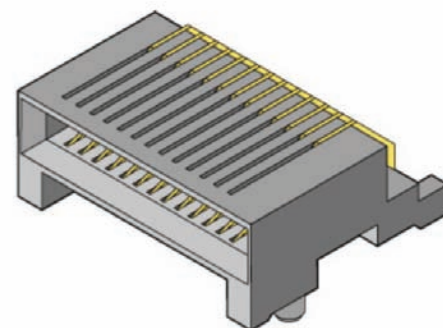
Voltage: 30V
 Current: 0.5A max.
 Contact Resistance: 30 milliohms max.
 Dielectric Withstanding Voltage: 500V AC
 Insulation Resistance:
 1000 Megohms min.

Mechanical

Contact Retention to Housing:
 4.45N (1 lbf)
 Mating Force: 1.25N (0.28 lbf) per circuit
 Unmating Force:
 0.25N (0.06 lbf) per circuit
 Durability: 250 cycles for 30µ" Gold (Au) plating

Physical

Housing: High-Temperature Thermoplastic Glass Filled, UL 94V-0, Black
 Contact: Copper (Cu) Alloy
 Plating:
 Contact Area — 15µ" (0.38µm) or 30µ" (0.76µm) Gold (Au)
 Solder Tail Area — Tin (Sn)
 Underplating — Nickel (Ni)
 RoHS Compliant: Yes
 Operating Temperature: -40 to +80°C



ORDERING INFORMATION

Order No.	Circuit Size	Gold (Au) Plating Option
75586-0010	38	15µ"
75586-0011		30µ"

* InfiniBand is a registered trademark of the InfiniBand Trade Association

Molex QSFP+ EMI cages improve EMI loss through effective gasketing and offer multi-port options, for high-density applications

Molex QSFP+ cages feature internal EMI spring fingers that effectively contain EMI between the cage and module. Unlike XFP, the QSFP+ cage-to-bezel gasket is included with the QSFP+ cage. Cages use press-fit pins and can be used in single-sided or belly-to-belly applications.

The QSFP+ cage has a standard blocking key that prevents mis-mating of a XFP module. Molex QSFP+ cages are supported by thermal heat sinks and light pipes for optimal system layout and unique customization.

Molex provides a total system solution with copper cables (74757), optical cables (106283), loopback adapters (74763), and connectors (75586) along with EMI cages. All QSFP+ cages accept copper cables or fiber optic modules.

FEATURES AND BENEFITS

- One-piece, press-fit cage results in low-cost manufacturing
- Spring-finger and elastomeric gasket options provide design flexibility and optimal EMI grounding
- 360° EMI cage shielding to bezel and transceiver prevents EMI interference
- Blocking keys prevent mis-mating by XFP module
- Multiport cages (1-by-3, 1-by-4) offer design options for high-density applications

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

74750 EMI Cage 1-by-1, Heat Sinks

74768 EMI Cage 1-by-3

74769 EMI Cage 1-by-4

74783 Heat Sink Clip



1-by-3 and 1-by-4 EMI Cages shown with Dual Light Pipes, Heat Sink and Elastomeric Gasket

SPECIFICATIONS

Reference Information

Packaging: Tray and Box
 Mates With: Cable Assemblies
 (Series 74757, 74763, 111040)
 Use With: Connector (Series 75586)
 Designed In: Millimeters

Mechanical

Cage Insertion Force to PCB:
 578N (130 lbf) max. (Series 74750)
 Durability: 1 cycle (to PCB)

Physical

Operating Temperature: -55 to +105°C
 EMI Cages:
 Housing: Copper (Cu) Alloy
 Plating: Nickel (Ni)
 Light Pipe Clip Assemblies:
 Light Pipe: Polycarbonate
 Heat Sink: Aluminum (Al)
 Heat Sinks:
 Heat Sink: Aluminum (Al)
 Heat Sink Finish: Black Anodized

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

74750 EMI Cage Assembly 1-by-1
 74768 EMI Cage Assembly 1-by-3
 74769 EMI Cage Assembly 1-by-4

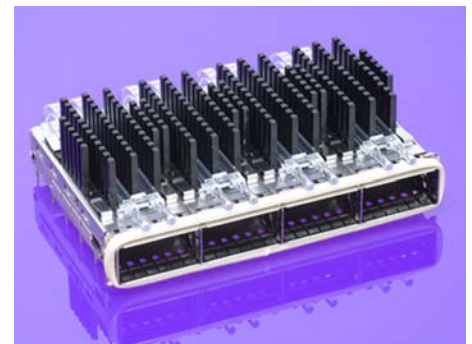


Concept: 1-by-4 Cage with Heat Sinks

ORDERING INFORMATION

Cage Assemblies with Heat Sinks

Order No.	Gasket Style or Light Pipe	Press-Fit Pins	Application	Port size
74750-0040	EMI Spring Finger	Two rear	SAN	1-by-1
74750-0041	Elastomeric	Two rear	SAN	1-by-1
74750-0042	EMI Spring Finger	No rear	SAN	1-by-1
74750-0043	Elastomeric	No rear	SAN	1-by-1
74750-0044	EMI Spring Finger	Two rear	PCI	1-by-1
74750-0045	Elastomeric	Two rear	PCI	1-by-1
74750-0046	EMI Spring Finger	Two rear	NET	1-by-1
74750-0047	Elastomeric	Two rear	NET	1-by-1
74750-0072	Dual Light Pipe	Two rear	SAN	1-by-1
74750-0086	Dual Light Pipe	No rear	SAN	1-by-1
74768-0501	Single Light Pipe	Two rear	SAN	1-by-3
74768-0503	Dual Light Pipe	Two rear	SAN	1-by-3
74768-0504	Dual Light Pipe	Two rear	NET	1-by-3
74768-0505	No Light Pipe	Two rear	PCI	1-by-3
74768-0506	No Light Pipe	Two rear	SAN	1-by-3
74769-0501	Single Light Pipe	Two rear	SAN	1-by-4
74769-0503	Dual Light Pipe	Two rear	SAN	1-by-4
74769-0504	Dual Light Pipe	Two rear	NET	1-by-4
74769-0505	No Light Pipe	Two rear	PCI	1-by-4
74769-0506	No Light Pipe	Two rear	SAN	1-by-4



1-by-4 Cage with Dual Light Pipes and Heat Sinks

SPECIFICATIONS



Reference Information

Packaging: Tray and Box
Mates With: Cable Assemblies
(Series 74757, 74763, 111040)
Use With: Connector (Series 75586)
Designed In: Millimeters

Mechanical

Insertion Force to PCB:
130 lbf max. (Series 74750)
Durability: 1 cycle (to PCB)

Physical

Housing: Copper (Cu) Alloy
Plating: Nickel (Ni)
Operating Temperature: -55 to +105°C

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

74750 EMI Cage 1-by-1,
Heat Sinks

74768 EMI Cage 1-by-3

74769 EMI Cage 1-by-4

ORDERING INFORMATION

Order No.	Gasket Style	Pins	Port size
74750-0021	EMI Spring Finger	Two rear press-fit pins	1-by-1
74750-0022	Elastomeric	Two rear press-fit pins	1-by-1
74750-0023	EMI Spring Finger	No rear pins	1-by-1
74750-0024	EMI Spring Finger	Two rear press-fit pins	1-by-1, Closed Top
74750-0025	Elastomeric	No rear pins	1-by-1
74750-0026	Elastomeric	Two rear press-fit pins	1-by-1, Closed Top
74750-1100	EMI Spring Finger	Two rear press-fit pins, tear-drop style	1-by-1
74750-1101	EMI Spring Finger	No rear pins, tear-drop style	1-by-1
74750-1102	EMI Spring Finger	Two rear press-fit pins, tear-drop style	1-by-1, Closed Top
74750-1103	EMI Spring Finger	No rear pins, tear-drop style	1-by-1, Closed Top
74750-1200	Elastomeric	Two rear press-fit pins, tear-drop style	1-by-1
74750-1201	Elastomeric	No rear pins, tear-drop style	1-by-1
74750-1202	Elastomeric	Two rear press-fit pins, tear-drop style	1-by-1, Closed Top
74750-1203	Elastomeric	No rear pins, tear-drop style	1-by-1, Closed Top
74768-0210	Elastomeric	No rear pins	1-by-3
74768-0212	Elastomeric	Two rear press-fit pins	1-by-3
74768-0223	Elastomeric	Two rear press-fit pins	1-by-3, Closed Top
74769-0212	Elastomeric	Two rear press-fit pins	1-by-4



Single Cage with Spring Fingers



1-by-4 Cage with Elastomeric Gasket



Cages Family

SPECIFICATIONS

Reference Information

Packaging: Tray and Box

Mates With:

Cages (Series 74750, 74768, 74769)

Designed In: Millimeters

Physical

Light Pipe: Polycarbonate

Heat Sink: Aluminum (Al)

Heat Sink Finish: Black Anodized

Operating Temperature: -55 to +105°C

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

74750 Light Pipe Clip Assembly
1-by-1

74768 Light Pipe Clip Assembly
1-by-3

74769 Light Pipe Clip Assembly
1-by-4

74783 Heat Sink Clip
with Light Pipe

ORDERING INFORMATION

Light Pipe Clip Assemblies

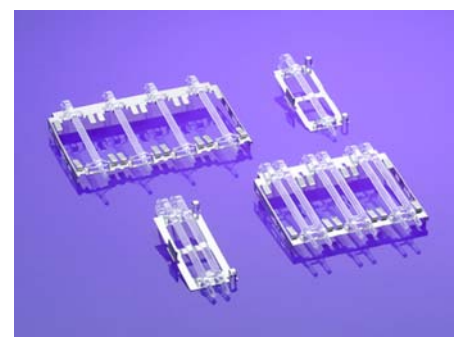
Order No.	Light Pipes	Port Size
74750-0030	Single	1-by-1
74750-0031	Dual	1-by-1
74768-0403	Single	1-by-3
74768-0404	Dual	1-by-3
74769-0403	Single	1-by-4
74769-0404	Dual	1-by-4

Heat Sink Clips

Order No.	Port Size
74750-0305	1-by-1
74783-0363	1-by-3
74783-0462	1-by-4

EMI Plug

Order No.	Port Size
74750-0600	1-by-1



Light Pipe Clip Assemblies



Heat Sink and Light Pipes Family

SPECIFICATIONS

Reference Information

Packaging: Tray and Box

Use With:

Cages (Series 74750, 74768, 74769)

Designed In: Millimeters

Physical

Heat Sink : Aluminum (Al)

Heat Sink Finish: Black Anodized

Operating Temperature: -55 to +105°C

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

74750 Heat Sinks



ORDERING INFORMATION

Heat Sinks

Order No.	Application	Port Size	Light Pipe
74750-0300	SAN	1-by-1	-
74750-0303	PCI	1-by-1	-
74750-0304	NET	1-by-1	-
74750-0307	SAN	1-by-3, 1-by-4	Single
74750-0314	PCI	1-by-3, 1-by-4	Single
74750-0317	NET	1-by-3, 1-by-4	Single
74750-0308	SAN	1-by-3, 1-by-4	Dual
74750-0318	NET	1-by-3, 1-by-4	Dual

NOTE: For ganged cages, please order 3 or 4 individual heat sinks depending on the required port size.



*Heat Sinks Suitable for SAN, NET and
PCI Applications*

QSFP+ Stacked Connectors and Cages offer compact, integrated space savings and ease of processing for dense switching applications

QSFP+ Stacked Multi-Port Connectors are the latest additions to Molex’s extensive QSFP product line. These high-port-density connectors offer complete integration of the connector within a cage and include optional light pipes to provide port-status indication to the user. These 25.50mm (1.004”) height stacked connectors provide two rows of vertically stacked QSFP+ ports.

The Stacked QSFP+ product is a natural extension of the very successful Stacked SFP/SFP+ products currently offered by Molex for Fibre Channel and Ethernet. Stacked QSFP+ connectors and cages provide a balanced differential channel featuring class-leading isolation and bandwidth, with a durability up to 100 cycles.

Molex’s QSFP+ interface provides a high-density, high-bandwidth, cost-effective solution for a multitude of markets and applications including switches, routers, Host Bus Adapters (HBAs), enterprise data centers, high-performance computing (HPC) and storage.

FEATURES AND BENEFITS

- High-speed contact wafer design supports data transmission speeds up to 10 Gbps
- Optional integrated light pipes for use with SMT Light Emitting Diode’s (LEDs) provides port status and activity feedback to the user
- Press-fit termination to PCB eliminates soldering, lowering the applied cost and avoiding solder-related issues
- Elastomeric gasket provides superior EMI containment

SPECIFICATIONS

Reference Information

Packaging: Tray
 UL File No.: E29179
 Mates With: 74757, 74763
 Designed In: Millimeters

Electrical

Voltage: 30V
 Current: 0.5A max.
 Contact Resistance: 30 milliohms max.
 Dielectric Withstanding Voltage: 500V AC
 Insulation Resistance: 1000 Megohms min.

Mechanical

Mating Force:
 0.75N (.17 lbf) per circuit
 Unmating Force:
 0.25N (.06 lbf) per circuit
 Durability:
 100 cycles for 30µ” Gold (Au) plating

Physical

Housing: High-Temperature Thermoplastic Glass Filled, UL 94V-0, Black
 Contact: Copper (Cu) Alloy
 Plating:
 Contact Area — 30µ” (0.76µm) Gold (Au)
 Signal Tail Area — Tin / Lead (Sn/Pb)
 Underplating — Nickel (Ni)
 RoHS Compliant: Yes – By Exemption
 Operating Temperature: -40 to +80°C

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

76870 2-by-3 Stacked Integrated Connector and Cage

76871 2-by-1 Stacked Integrated Connector and Cage



2-by-3 Stacked Integrated Connector and Cage



2-by-1 Stacked Integrated Connector and Cage (Series 76871)

ORDERING INFORMATION

Order No.	Port Size	Light Pipes
76871-0001	2-by-1	No
76871-0002	2-by-1	Yes
76870-0001	2-by-3	No
76870-0002	2-by-3	Yes

Achieve up to 10 Gbps data rates, 360° EMI signal shielding and 30% PCB space savings over XFP modules with Molex's QSFP+ cable assemblies, ideal for high-density applications

The QSFP+ connector is the same height and width as an XFP module. In addition, it takes up only 30% more PCB space than SFP+ while providing three additional high-speed lanes. This translates into the best value per PCB square inch in the 10G marketplace.

Molex QSFP+ copper cables support serial ID function, providing the host with necessary information to make system setup as transparent as optical modules.

Molex copper cables are designed for optimal usage up to 15m (approximately 50 ft. lengths) while Molex optical cables are best for lengths greater than 15m. Molex QSFP+ copper cables are designed to support multiple common standards including InfiniBand* DDR and QDR, SAS 2.1, 10G Ethernet and Fibre Channel.

FEATURES AND BENEFITS

- Zinc die-cast back shells on cable plug provide 360° EMI signal shielding
- Compliant with QSFP+ SFF-8436 specification meets industry standard
- Data rate up to 10 Gbps per lane for QSFP+ assemblies (Series 111040) and 7 Gbps for QSFP assemblies (Series 74757) providing higher overall bandwidth than standard SFP+
- Hot-pluggable transceiver allows insertion and removal of plug without powering down the system
- Pull-to-release de-latching design enables cables in belly-to-belly and stacked-cage implementations and ensures highest possible port density

SPECIFICATIONS

Reference Information

Packaging: Box
 Mates With: 75586
 Use With: 74750, 74768, 74769
 Designed In: Millimeters

Electrical

Voltage: 3.3V
 Current: 30.0A max.

Mechanical

Insertion Force: 40N (9.0 lbf) max.
 Retention Force: 90N (20.2 lbf) min.
 Durability: 250 cycles

Physical

Housing: Zinc (Zn) die cast
 Plating: Nickel (Ni)
 PCB contact: Gold (Au)
 Operating Temperature: -55 to +105°C

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

74757 QSFP 7 Gbps Passive Copper Patch Cable Assemblies

111040 QSFP+ 10 Gbps Passive Copper Patch Cable Assemblies



Passive Copper Patch Cable Assembly (Series 74757, 111040)

ORDERING INFORMATION

QSFP 7 Gbps Passive Copper Patch Cable Assemblies

Order No.	Length	Cable Gauge (AWG)
74757-1101	1.00m (3.281')	30
74757-1301	3.00m (9.843')	
74757-1501	5.00m (16.404')	
74757-9001	10.00m (32.808')	
74757-2101	1.00m (3.281')	28
74757-2301	3.00m (9.843')	
74757-2501	5.00m (16.404')	
74757-9005	10.00m (32.808')	
74757-3101	1.00m (3.281')	26
74757-3301	3.00m (9.843')	
74757-3501	5.00m (16.404')	
74757-9003	10.00m (32.808')	
74757-4101	1.00m (3.281')	24
74757-4301	3.00m (9.843')	
74757-4501	5.00m (16.404')	
74757-9004	10.00m (32.808')	

QSFP+ 10 Gbps Passive Copper Patch Cable Assemblies

Order No.	Length	Cable Gauge (AWG)
111040-1104	1.00m (3.281')	30
111040-1304	3.00m (9.843')	
111040-1504	5.00m (16.404')	
111040-9010	10.00m (32.808')	
111040-2104	1.00m (3.281')	28
111040-2304	3.00m (9.843')	
111040-2504	5.00m (16.404')	
111040-9011	10.00m (32.808')	
111040-3104	1.00m (3.281')	26
111040-3304	3.00m (9.843')	
111040-3504	5.00m (16.404')	
111040-9012	10.00m (32.808')	
111040-4104	1.00m (3.281')	24
111040-4304	3.00m (9.843')	
111040-4504	5.00m (16.404')	
111040-9013	10.00m (32.808')	

* InfiniBand is a registered trademark of the InfiniBand Trade Association

Molex QSFP+ copper loopback adapters provide standard and custom high-speed data transmission test options for test engineers

Molex loopbacks are used to test host I/O system external ports. They help manufacturers ensure that gigabit links are operational before a system ships. Molex QSFP+ loopbacks have additional port-testing capabilities.

In addition to testing high-speed signals, users can test low-speed functions such as loss of signal, Tx disable, and ModPresL. Optical loopbacks also can be used to load power lines.

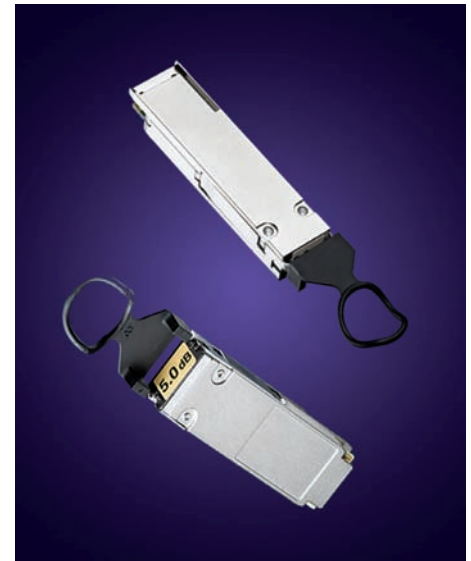
Molex loopbacks are designed for high-speed data rates from 2.5 to 12 Gbps. They support applications such as Fibre Chanel, InfiniBand*, SAS and 10G Ethernet. The hot-pluggable feature allows changing to and from another compatible module without having to remove system power. QSFP+ modules provide complete serial ID compliance.

FEATURES AND BENEFITS

- Loops Tx to Rx data paths on all lanes up to 10 Gbps enable manufacturing test engineers to verify highspeed data transmission for all ports
- Serial ID allows serial identification to and from host
- Hot pluggable design enables transceiver to be removed or installed without powering off the system
- Unique pull latch enables cables in belly-to-belly and stacked cage implementations
- DC blocking caps in each Tx and Rx path enable loopback to appear like a cable in test operation
- Standard and custom attenuation provides DC attenuation of different cable lengths
- Universal option available
 - Tests LOS, Tx Disable, SCL and SDA, OSO and OS1 Rate Select, Tx_Fault and Mod_Abs (SFP+)
 - Tests LOS, Tx Disable, ModPresL, IntL, ModseIL, LPMODE_Reset, SCL and SDA (QSFP+)
 - Load power lines with worst-case load per SFF-8436 specification
 - Tests that both VCCT and VCCR supplies are active
 - Able to isolate VCCTx and VCCRx

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

74763 Copper Loopback Adapters



Copper Loopback Adapter

SPECIFICATIONS

Reference Information

Packaging: Tray and Box
 Mates With: 75586
 Use With: 75750
 Designed In: Millimeters

Electrical

Voltage: 3.3V
 Current: 30.0A max.

Mechanical

Insertion Force: 40N (9.0 lbf) max.
 Retention Force: 90N (20.2 lbf) min.
 Durability: 250 cycles

Physical

Housing: Zinc (Zn) die cast
 Plating: Nickel (Ni)
 PCB contact: Gold (Au)
 Operating Temperature: -40 to +85°C

ORDERING INFORMATION

Order No.	Attenuation
74763-0010	0db
74763-0025	5db

* InfiniBand is a registered trademark of the InfiniBand Trade Association

QSFP+ Active Optical Cables from Molex achieve 40 Gbps data rates over long reaches up to 4km with best-in-class power consumption and low 10e-18 BER

Molex’s low-power AOC integrated cable solution provides less expensive, reliable transport for aggregated data rates up to 40 Gbps. The AOCs offer customers the flexibility of traditional optical modules by interfacing to systems via a standard QSFP+ MSA connector. The cable is electrically compliant with the QSFP+ interface InfiniBand* SDR/DDR/QDR, Ethernet (10 and 40 Gbps), Fibre Channel (8 and 10 Gbps), SAS (6 Gbps) and other protocol applications.

FEATURES AND BENEFITS

- Extremely low power consumption of only 0.78W per cable end, 30% less than competition, improves overall data-center power consumption and thermal efficiency and enables deployment of additional ports for increased number of AOCs per system, resulting in more connectivity options and total system cost savings
- Four bi-directional optical data links per end, each operating at data rates from 1.0 to 10.3125 Gbps is compatible with multiple protocols including InfiniBand single data rates (SDR), dual data rates (DDR) and quad data rates (QDR), Ethernet systems (10 and 40 Gbps), Fibre Channel (8 and 10 Gbps) and SAS (6 Gbps)
- Low Bit Error Rate (BER) of 10e-18 errors per link provides increased data reliability and robustness of link versus standard transceivers with 10e-12 errors per link
- Optical transceivers are permanently attached to the fiber, with no air gaps so the interface provides protection from environmental contaminants and user disturbances during installation
- High-density QSFP+ interface meets compliant connection meeting QSFP+ Multi-Source Agreement (MSA) requirements
- Hot-pluggable transceiver allows insertion and removal of devices without powering down the system
- CMOS photonics-technology-based optical transceiver integrated on a single CMOS chip resulting in low-cost cable delivering high performance and long-term reliability

QSFP+ Active Optical Cables

106410 QSFP+ Active Optical Cables



QSFP+ Active Optical Cable (Series 106410)

- Single-mode fiber technology has longer reach than copper and multi-mode fiber solutions, enabling deployment in data center and campus environments
- Cable available in standard lengths up to 300m and custom lengths up to 4km (2.49 miles) for design flexibility

*InfiniBand is a trademark of the InfiniBand Trade Association

SPECIFICATIONS

Reference Information

Packaging:
 Box for 21.00m (68.90’) and above
 Bag for 20.00m (65.62’) and below

Mates With:
 iPass™ 38-circuit connector (Series 75586)
 EMI Cages (Series 74750, 74767, 74768, 74769)
 EMI Cages and Heat Sinks (Series 74750)

Use With:
 Passive Cables (Series 111040)
 Active Cables (Series 111108)
 Designed In: Millimeters

RoHS: Yes
 Halogen Free: Yes

Electrical

Voltage: 3.47V max.
 Current: 310mA max.
 Power Consumption:
 0.78W min., 0.97W max.
 Data Rate: 1.0 to 10.325 Gbps

Mechanical

Cable Pull Force: 222.41N (50 lbf) min.
 Fiber Bend Radius: 25.00mm (.984”) min.
 Fiber Type: Single-mode
 Cable Type: Plenum

Physical

Interface: QSFP+ to QSFP+
 Operating Temperature: 0 to +70°C

ORDERING INFORMATION

Order No.	Cable Length
106410-1001	1.00m (3.28’)
106410-1003	3.00m (9.84’)
106410-1005	5.00m (16.40’)
106410-1007	7.00m (22.97’)
106410-1010	10.00m (32.81’)
106410-1015	15.00m (49.21’)
106410-1020	20.00m (65.62’)
106410-1030	30.00m (98.43’)
106410-1050	50.00m (164.04’)
106410-1100	100.00m (328.08’)
106410-1150	150.00m (492.13’)
106410-1200	200.00m (656.17’)
106410-1300	300.00m (984.25’)

QSFP+ optical cable assemblies use low-profile round cables for improved cable management in high-density applications

Molex Quad Small Form Pluggable (QSFP+) passive optical cable assemblies meet the QSFP+ interface specification. Multiple cable designs provide improved fiber management options depending on the application and distance requirements. MTP* QSFP+ cables are constructed with 12 fiber 3.1mm round cable for short-run interconnect cable assemblies. A robust 4.5mm round cable with 3.1mm sub-units provides exceptional cable flexibility while ensuring cable integrity and improved cable routing for installations that require chassis to be spread out more than 30 meters.

In addition to the standard MTP QSFP+ jumper assemblies, break-out cables and loopback assemblies provide a complete QSFP+ optical solution. The MTP QSFP+ breakouts from QSFP+ modules to LC's are available for SFP+ or patch-panel installations. MTP QSFP+ loopbacks feature a compact housing compatible with module spacing and loop optical transmit ports to receive ports for testing, burn-in and field troubleshooting.

FEATURES AND BENEFITS

- MTP/MPO QSFP+ connector interface meets QSFP+ SFF-8436 interface specification
- Low-profile round cable provides improved cable management
- Standard or 10 Gbps bandwidth available featuring optimized bandwidth for each application
- Compact design for testing, burn-in or field troubleshooting
- RoHS compliant design meets EU environmental requirements for electronic equipment and accessories

SPECIFICATIONS

Reference Information

Packaging: Individual pack in a bag
Mates With: QSFP+ Modules

Optical

Fiber Specifications:
Multi Mode: 50/125µm
Insertion Loss at Test:
Multi Mode: 0.15dB; Typ.; ≤0.5dB max.
Bandwidth: See table, page 12

Mechanical

Minimum Bend Radius:
31.75mm (1.25") long-term

Physical

Fire Rating: OFNP (Plenum)
Operating Temp: 0 to +70°C
Storage Temp: -40 to +70°C
Jacket Dimensions:
1 to 30 Meters:
3.1mm Interconnect Cables
31 to 300 Meters:
4.5mm Distribution Cables

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

106283 Optical MTP* Cable Assemblies

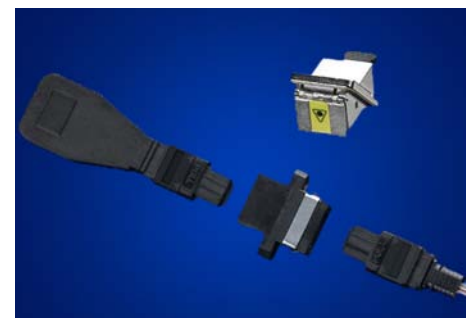
106005 Optical MTP Loopback Assembly



Optical MTP Jumper



Optical MTP to LC Breakout



Optical MTP Loopback Assembly

ORDERING INFORMATION

Order No.	Length	Bandwidth (See table 1)	QSFP+ Optical Cable Assembly Description
106283-0001	1.00m (3.285')	Standard	QSFP+ MTP to QSFP+ MTP, 3.1mm, 8 fiber, OFNP
106283-0005	5.00m (16.404')		
106283-0010	10.00m (32.808')		
106283-0015	15.00m (49.213')		
106283-0020	20.00m (65.617')		
106283-0025	25.00m (82.021')		
106283-0030	30.00m (98.425')		
106283-1001	1.00m (3.285')	High	QSFP+ MTP to QSFP+ MTP, 3.1mm, 8 fiber OFNP
106283-1005	5.00m (16.404')		
106283-1010	10.00m (32.808')		
106283-1015	15.00m (49.213')		
106283-1020	20.00m (65.617')		
106283-1025	25.00m (82.021')		
106283-1030	30.00m (98.425')		
106283-5001	1.00m (3.285')	Standard	QSFP+ MTP to 4 Duplex LC, 3.1mm, 8 fiber, OFNP
106283-5003	5.00m (16.404')		
106283-5101	1.00m (3.285')	High	QSFP+ MTP to 4 Duplex LC, 3.1mm, 8 fiber
106283-5103	5.00m (16.404')		
106283-5201	1.00m (3.285')	Standard	QSFP+ MTP to 8 Simplex LC, 3.1mm, 8 fiber, OFNP
106283-5203	5.00m (16.404')		
106283-5301	1.00m (3.285')	High	QSFP+ MTP to 8 Simplex LC, 3.1mm, 8 fiber OFNP
106283-5303	5.00m (16.404')		
106005-1100	N/A	N/A	QSFP+ MTP Loopback

Note: Additional lengths are available.

Quad Small Form-factor Pluggable Plus (QSFP+) Interconnect Solution

106283 Optical MTP*
Cable Assemblies

106005 Optical MTP
Loopback Assembly

Table 1 - Bandwidth Reference Chart

Fiber Type	Overfilled Launch Bandwidth, Min. (MHz-km)		1 Gigabit Ethernet Link Distance, Min. (m)		10 Gigabit Ethernet Link Distance, Min. (m)	
	850nm	1300nm	850nm	1300nm	850nm	1300nm
Standard Bandwidth	500	500	600	600	86	-
High Bandwidth	1500		900	550	300	

*MTP is a registered trademark of US Conec Ltd.