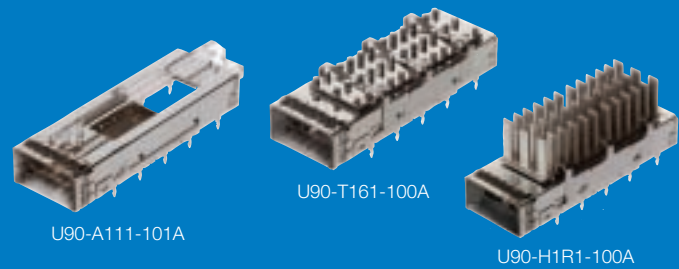


ExpressPort™ QSFP+ QSFP



The ExpressPort™ QSFP+/QSFP Interconnect system is comprised of a 38-position 0.8 mm pitch SMT connector and a press-fit cage designed to comply with the Quad Small Form-factor Pluggable (QSFP) Transceiver Specifications. The connector system is capable of data rates beyond 10 Gbps per channel (4 channels) and is intended for external connections (38-position connector). High speed serial interconnect applications include clusters, servers and storage devices.

The ExpressPort™ QSFP+ E-series connector family is rated at 28 Gbps per channel (4x28), featuring a stamped and formed contact design providing improved mechanical durability. This connector features an integrated grounding structure and resonance dampening features for superior crosstalk performance. The contact design is optimized for a smooth impedance profile resulting in low losses. The ExpressPort™ QSFP+ E-series connector is designed for IBTA [EDR] applications (25.78 Gbps) and is fully compatible with industry standard SFF-8436 QSFP+ modules. The QSFP+ E-series connector is fully compatible with existing QSFP and QSFP+ cages.

Specification Highlights

The QSFP interconnect system is comprised of a press-fit cage assembly which is used with 38-position, 0.8 mm pitch connectors complying with QSFP Transceiver Specifications.

Mechanical Characteristics

- Cage is keyed according to QSFP MSA
- Durability: 250 mating cycles minimum
- Connector insertion force: 40 N max
- Connector withdrawal force: 30 N max

Electrical Characteristics

- Operating voltage: 30 V
- Insulation resistance: 1000 M Ω min
- Contact resistance: 70 m Ω max
- Differential impedance: 100 Ω +/- 10 Ω
- Operating current: 0.5 A
- DWV: 300 V AC
- Hot swappable

Signal Integrity Characteristics

- QSFP, ExpressPort™ QSFP+
- Return Loss: 10 dB
 - Near end isolation: -40 dB (frequencies up to 3 GHz)
 - Insertion loss: 0.13dB max (frequencies up to 1.25 GHz)
0.25 dB max (frequencies 1.25 - 2.50 GHz)
0.25 dB max (frequencies 2.50 - 5.00 GHz)
 - Rise time for impedance measurement: 25 ps
 - Within pair skew: 1 ps
 - NEXT: \leq 2%

ExpressPort™ QSFP+ E-series Connector

- Return loss: -12dB max (frequencies up to 14GHz)
- Insertion loss: 1.4dB max (frequencies up to 14GHz)
- Common mode conversion: -24dB max (up to 14 GHz)
- Integrated Crosstalk Noise: 3mV rms
- assumes 3 nearest-neighbor (most-detrimental) aggressor parameters and receiver parameters:
 - Near- & far-end aggressors' peak differential amplitude: 600mv
 - Near- & far-end aggressors' 20%-80% risetime: 9.6ps
 - 3dB reference receiver bandwidth: 18.75 GHz
 - Range of integration: 10MHz to 28 GHz
 - MDNEXT: 1mVrms MDNEXT: 2.8mVrms

Packaging

- Tape and reel packaging: connector or 1x1 cage
- Tray packaging: cage of all sizes
- Bulk packaging: dust cover

Materials

- Cage
 - Base material: copper alloy
 - Plating: nickel
 - Light pipe: optical grade polycarbonate
 - Heat sink: aluminum alloy
 - Heat sink clip: stainless steel
 - Dust cover: thermoplastic
- Connector
 - Contact base material: copper alloy
 - Contact plating: gold on mating area; matte tin on terminations and grounding tabs
 - Housings: glass reinforced, lead-free solder reflow process compatible thermoplastic, UL94V-0 rated

Temperature Rating

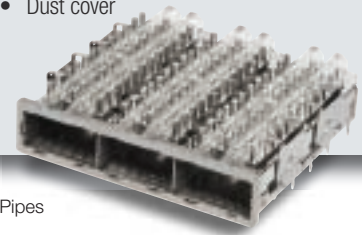
- Operating temperature: -40 °C to +85 °C
- Storage temperature: -40 °C to +85 °C

Configurations (Rows x Ports per row)

- 1x1
- 1x3
- 1x4
- 1x6

Options

- Cage design
 - Through the bezel
 - Behind the bezel
- Heat sinks
- Light pipe
 - Round 1.4 mm
 - Square 2.6x2.6 mm
- Dust cover



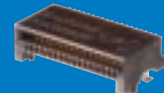
1x3 QSFP Cage
with Heat Sink and Round Light Pipes
U90-G351-101A



FS1-E38-20M0-10
28 Gbps



FS1-R38-20A2-10
16 Gbps



FS1-R38-20A2-01
12 Gbps

HIGH SPEED I/O PRODUCTS

Ordering Information

Contact Amphenol for additional options

Connectors:

- QSFP
- ExpressPort™ QSFP+
- ExpressPort™ QSFP+ E-series

FS1 - R38 - X0 XX - XX

FS1 SERIES DESIGNATION

R38 R38 - 38 Position Connector (QSFP, ExpressPort™ QSFP+)
E38 - 38 Position connector (ExpressPort™ QSFP+ E-series)

X PLATING

- 2 - 30µ" Gold Plating on Mating Area
Matte Tin Plating on Termination
- 3 - 15µ" Gold Plating on Mating Area
Matte Tin Plating on Termination

0 0 - Standard

SPECIAL

XX	Features		Bandwidth per Channel	
	Resonance Dampening	Hold down tabs	FS1-R38 QSFP+	FS1-E38 E-series
00	NO	NO	12 Gbps	Contact Amphenol
10	YES	NO	16 Gbps	28 Gbps
01	NO	YES	12 Gbps	N/A
11	YES	YES	16 Gbps	N/A

OPTIONS

- 00 - QSFP Connector
- 0A - Connector with Hold Down Tabs
- A2 - QSFP+ Connector
- M0 - E-series Connector

Ordering Information

Contact Amphenol for additional options

Cages:

- QSFP
- ExpressPort™ QSFP+

U90 - XXX1 - 1XXX

U90 SERIES DESIGNATION (RoHS)

X STYLE

- A - One Row Cage 0°
- G - One row Cage - 0° Behind Bezel
- H - One row Cage - 0° Thru the Bezel w/optional Light Pipe
- L - One row Cage - 0° No Pins on Back Wall
- R - Thru the Bezel with Low Profile, Low Force Heat Sink Clip and Low Profile Heat Sink

X NUMBER OF PORT IN ROW

- 1 - 1x1 ports
- 3 - 1x3 ports
- 4 - 1x4 ports
- 6 - 1x6 ports

X HEAT SINK OPTION

- 1 - No Heat Sink and No Clip Shipped
- 2 - Fin Style (Black Oxide) Heat Sink and Clip (H=6.5 mm)
- 3 - Fin Style (Black Oxide) Heat Sink and Clip (H=4.2 mm)
- 4 - Fin Style (Black oxide) Heat Sink and Clip (H=13.5 mm)
- 5 - Pin Style (Nickel Plated) Heat Sink and Clip (H=6.5 mm)
- 6 - Pin Style (Nickel Plated) Heat Sink and Clip (H=4.2 mm)
- 7 - Pin Style (Nickel Plated) Heat Sink and Clip (H=13.5 mm)
- D - Pin-Fin Style (Black Oxide) Heat Sink and Clip (H=6.5 mm)
- E - Pin-Fin Style (Black Oxide) Heat Sink and Clip (H=4.2 mm)
- F - Pin-Fin Style (Black Oxide) Heat Sink and Clip (H=13.5 mm)
- R - Pin-Fin Style (Nickel Plated) Heat Sink and Clip (H=13.5 mm)

PACKAGING

- 1 - Tray Packaging
- T - Tape and Reel Packaging
- A - Tray Packaging with Heat Sink and Clip or Light Pipe Shipped Assembled

LIGHT PIPES OPTION

- 0 - Standard
- 1 - With Light Pipes (Round 1.4 mm Outlet)
No EMI gasket
- 3 - With Light Pipes (Square 2.6 x 2.6 mm Outlet)
No EMI Gasket

OPTIONAL DUST COVER

- 0 - Without Dust Cover
- D - With Dust Cover (Ship Loose)

PLATING

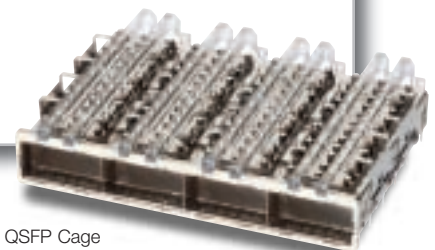
- 1 - Nickel

APPLICATION

- 1 - Press Fit Pins - 2.5 mm Long



1x1 QSFP Cage
with Heat Sink and Dust Cover
U90-A131-1D01



1x4 QSFP Cage
with Heat Sink and Square Light Pipes
U90-G461-103A