

ExpressPort™ QSFP+ / QSFP



U90-C101-3000

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 intended for external connections. High speed serial interconnect applications include clusters, servers, and storage devices.

The ExpressPort™ QSFP+ E-Series and H-Series connector families are rated to 28 Gbps and 40 Gbps respectively 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 improved SI performance.

Specification Highlights

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

Mechanical Characteristics

- Cage is Keyed According to QSFP MSA
 - QSFP+: SFF-8436
 - E-Series: SFF-8672
 - H-Series: TBD
- Durability: 250 Mating Cycles min
- Connector Insertion Force: 40 N max
- Connector Withdrawal Force: 30 N max

Electrical Characteristics

- Hot Swappable
- Operating Voltage: 30 V
- Operating Current: 0.5 A
- Differential Impedance: 100 Ω +/- 10 Ω
- DWV: 300 V AC
- Insulation Resistance: 1000 M Ω min
- Contact Resistance: 70 m Ω max

Packaging

- Tape and Reel Packaging: Connector or 1x1 Cage
- Tray Packaging: Cage of all Sizes
- Bulk Packaging: Dust Cover

Temperature Rating

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

Configurations (Rows x Ports per Row)

- 1x1 • 1x2 • 1x3 • 1x4 • 1x6

Options

- Dust Cover
- Light Pipe
 - Round 1.4 mm
 - Square 2.6x2.6 mm
- Heat Sink
- Cage Design
 - Through or Behind the Bezel

Materials

- Cage
 - Base Material: Copper Alloy
 - Plating: Nickel or Tin
 - 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

Signal Integrity Characteristics

QSFP, ExpressPort™ QSFP+

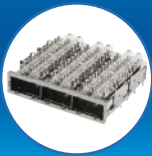
- Return Loss: -12 dB
- Near-End Isolation: -30 dB (frequencies up to 3 GHz)
- Insertion Loss: -1 dB max
- Rise Time for Impedance Measurement: 35 ps
- Within Pair Skew: 1 ps
- NEXT: $\leq$ 2%

ExpressPort™ QSFP+ E-Series Connector

- Return Loss: -12 dB max (frequencies up to 14 GHz)
- Insertion Loss: 1.4 dB max (frequencies up to 14 GHz)
- Common Mode Conversion: -24 dB max (up to 14 GHz)
- Integrated Crosstalk Noise: 3 mV rms
 - Assumes 3 Nearest-Neighbour (most detrimental) Aggressor Parameters and Receiver Parameters:
 - Near- and Far-End Aggressors' Peak Differential Amplitude: 600 mV
 - Near- & Far-End Aggressors' 20-80% Risetime: 9.6 ps
 - 3 dB Reference Receiver Bandwidth: 18.75 GHz
 - Range of Integration: 10 MHz to 40 GHz
 - MDNEXT: 1 mV rms; MDFEXT: 2.8 mV rms

ExpressPort™ QSFP+ H-Series Connector

- Return Loss: < -20 dB to 12GHz, -12 dB to 20GHz
- Near End Isolation: -40 to 20 GHz
- Insertion Loss: -1dB up to 20GHz
- Differential Impedance: 100 +/- 5 Ω at 35 ps
- Within pair skew: <1 ps



U90-G351-101A



FS1-R38-2000

Ordering Information

Connectors:

QSFP

ExpressPort™ QSFP+

ExpressPort™ QSFP+ E-Series

ExpressPort™ QSFP+ H-Series

FS1 SERIES DESIGNATION (RoHS)

X38 R38 - 38 Position Connector (QSFP 10G, ExpressPort™ QSFP+ 12G+ & 16G)
 E38 - 38 Position Connector (ExpressPort™ QSFP+ E-Series 28G)
 H38 - 38 Position Connector (ExpressPort™ QSFP+ H-Series 40G)

X PLATING

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

0 0 - Standard

FS1-X38-X0XX-XX

SPECIAL

QSFP+ (12 Gbps and Up)

00 - No Resonance Dampening, No Hold Down Tabs

01 - No Resonance Dampening, Hold Down Tabs

QSFP+ (16 Gbps)

10 - Resonance Dampening, No Hold Down Tabs

11 - Resonance Dampening, Hold Down Tabs

E-Series (28 Gbps) / H-Series (40 Gbps)

10 - Resonance Dampening, No Hold Down Tabs

OPTIONS

00 - QSFP Connector

0A - Connector with Hold Down Tabs

A2 - QSFP+ Connector

M0 - E-Series Connector

HX - H-Series Connector

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Cages:

QSFP

ExpressPort™ QSFP+

U90 SERIES DESIGNATION (RoHS)

X STYLE

A - One Row Cage 0°, Through the Bezel (No Light Pipe)
 C - One Row Cage 1°, Through the Bezel (1x1 Only, No Light Pipe)
 D - One Row Cage 0°, Hybrid with Elastomeric Gasket
 G - One Row Cage 0°, Behind the Bezel
 H - One Row Cage 0°, Through the Bezel with Optional Light Pipe
 K - One Row Cage 0°, Through the Bezel with No Heat Sink Opening
 L - One Row Cage 0°, No Pins on Back Wall
 P - One Row Cage 0°, Behind the Bezel with Low Profile Heat Sink and Clip
 R - One Row Cage 0°, Through the Bezel with Low Profile Heat Sink
 T - One Row Cage 0°, Through the Bezel with Low Profile Heat Sink and Clip and Optional Light Pipe

X NUMBER OF PORTS IN ROW

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

X HEAT SINK OPTION

1 - No Heat Sink or 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)
 N - Pin-Fin Style (Nickel Plated) Heat Sink and Clip (H = 6.5 mm)
 P - Pin-Fin Style (Nickel Plated) Heat Sink and Clip (H = 4.2 mm)
 R - Pin-Fin Style (Nickel Plated) Heat Sink and Clip (H = 13.5 mm)

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PACKAGING

1 - Tray Packaging

T - Tape and Reel Packaging (1x1 Only)

A - Tray Packaging Heat Sink and Clip or Light Pipe Shipped Assembled

LIGHT PIPE OPTION

0 - Without Light Pipe

1 - Round 1.4 mm Outlet Light Pipe, No EMI gasket

3 - Square 2.6x2.6 mm Outlet Light Pipe, No EMI gasket

DUST COVER OPTION

0 - Without Dust Cover

D - With Dust Cover (Shipped Loose)

PLATING

1 - Nickel

APPLICATION

1 - Press Fit Pins (2.5 mm Long)

X

X

X

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