zQuad Small Form-Factor Pluggable Plus (zQSFP+) Interconnect System

Supporting 100 Gbps Ethernet and InfiniBand Enhanced Data Rate (EDR) applications, Molex’s zQSFP+ Interconnect System transmits up to 28 Gbps per-serial-lane data rates and offers thermal protection and Temp-Flex Cable Assemblies to ensure excellent signal integrity (SI) and prevent electromagnetic interference (EMI).

Features and Benefits

28 Gbps Temp-Flex Cable Assemblies (Series 100297)

Temp-Flex cable technology
Boosts electrical performance. Provides excellent operational margin, short lead times and minimal end-user cost via manufacturing efficiencies.

32, 30 and 26 AWG cables
Fulfills all industry application needs at lengths up to 5m. Enhances cost structure and lead-time.

Fully integrated design
Incorporates all components (backshells, cable, populated PCBs) from Molex. Ensures high-quality components are compiled into a comprehensive solution with a superior cost structure.

Meets IEEE 802.3bj, InfiniBand EDR and SAS 3.0 specifications
Functions across a wide variety of next-generation technologies and applications.

Operating temperature of -20 to +85°C
Enables use in higher temperatures and low cooling-cost environments.

Identical mating interface as the QSFP+ connector for backward compatibility
Protects end user’s current QSFP+ infrastructure investment.

Stacked integrated connectors include an elastomeric EMI gasket (Series 171565) or a metal EMI gasket (Series 171722)
Provides superior EMI containment and suppression.

Preferential coupling design uses a narrow-edge coupled, blanked- and formed-contact geometry, and insert molding
Provides superior signal integrity (SI) performance, including extremely low insertion loss (IL) of <0.8dB at frequencies up through 14 GHz.

Air vents
Enhance cooling.

Surface Mount Technology (SMT) design (Series 170432 version only)
Provides the option for placement on both sides of the PCB.

0.80mm pitch host connector designed for placement beneath EMI cage
Supports pluggable applications.

Proven 28 Gbps data rate with potential up to 40 Gbps per lane
Meets or exceeds past requirements for 100 Gigabit Ethernet and InfiniBand 100 Gigabit (EDR) applications. Supports current 10 Gbps Ethernet, 14 Gbps (FDR) InfiniBand and 16 Gbps Fibre Channel applications.

SMT Connectors (Series 170432) and Stacked Integrated Connectors and Cages (Series 171565 and 171722)
zQuad Small Form-Factor Pluggable Plus (zQSFP+) Interconnect System

Features and Benefits

Sheet Metal (Stainless Steel) EMI Cages (Series 100014, 100015, 100016, 100017, 100019 and 100086)

- **Stainless steel cage construction**
  Offers increased robustness versus copper alloy material

- **3D-style press-fit pin design**
  Increased board retention versus typical press pins

- **MTP/MPO QSFP+ connector interface**
  Meets QSFP+ SFF-8665 interface specification

- **Low-profile round cable**
  Improved cable management and flexibility for routing

- **Stainless steel cage construction**
  Offers up to 4 light pipes per port
  Enables increased system functionality

- **Nickel-plated heat sink**
  Provides increased thermal transfer from module to heat sink

- **MTP/MPO break out to duplex LC available**
  Allows QSFP to SFP connectivity

- **Standard OM3 or OM4 fiber available**
  Optimized bandwidth for each application

- **RoHS compliant design**
  Meets EU environmental requirements for electronic equipment and accessories

Optical MPO/MTP Cable Assemblies (Series 106283)

- **Low-profile round cable**
  Improved cable management and flexibility for routing

- **MPO/MTP break out to duplex LC available**
  Allows QSFP to SFP connectivity

Optical MPO/MTP Cable Assemblies (Series 106283)

- **Compact housing**
  Compatible with module spacing

- **Loop optical transmit ports to receive ports**
  Allows loopback testing of modules, cables during burn in and field troubleshooting

Applications

- **Telecommunication / Networking Equipment**
  - Hubs
  - Servers
  - Storage
  - Routers
  - Switches
  - Central Office
  - Cellular Infrastructure
  - Multi-Platform Service Systems

- **Enclosed fibers**
  No snagging or breakage of fiber/cable during installation and handling

Thermally Enhanced Connectors and Cages (Series 171722) and Accessories (Series 170328)

- **Drop-in replacement to standard cages**
  Enables quick and easy implementation without extensive redesign

- **Three thermal options available for the 2-by-1, 2-by-2 and 2-by-3 cages**
  Provides design flexibility to meet specific thermal management needs:
  - Through-flow cage
  - Internal riding heat sink (IRHS)
  - Top-riding heat sink
zQuad Small Form-Factor Pluggable Plus (zQSFP+) Interconnect System

Specifications

28 Gbps Temp-Flex Cable Assemblies

**REFERENCE INFORMATION**
Packaging: EMI bag

**ELECTRICAL**
Frequency Range: 10 MHz to 25 GHz
Number of Points: 3999
IF Bandwidth: 1 kHz
Supply Voltage: 3.3V DC +/- 5%
Supply Current (max.): 0.03A at 3.135V
Power Consumption (max.): 0.125W

**MECHANICAL**
Durability:
- PL1 – Performance Level 1 – 0.38µm Au – 50 cycles, 5-year life (no FMG)
- PL2 – Performance Level 2 – 0.76µm AU – 250 cycles, 10-year life (14-day FMG)

**PHYSICAL**
Backshells – Zinc Diecast
Pull – Nylon
De-Latch – Stainless Steel
Cable – 8pr, 100 Ohms differential, CL2
RoHS Compliant: Yes
Operating Temperature: -20 to +85°C
Non-Operating Temperature: -40 to +85°C

SMT Connectors

**REFERENCE INFORMATION**
Packaging: Tape and Reel
UL File No.: E29179
CSA File No.: LR19980
Mates with: Copper Cable Assemblies (Series 74757, 111040)
Designed in: Millimeters

**ELECTRICAL**
Voltage: 30V
Current (max.): 0.5A; Power Contacts 1.0A
Contact Resistance (max.): 30 milliohms
Dielectric Withstanding Voltage: 500V AC
Insulation Resistance (min.): 1000 Megohms

**MECHANICAL**
Contact Retention to Housing: 4.45N
Mating Force: 1.25N per circuit
Unmating Force: 0.25N 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

Stacked Integrated Connectors and Cages

**REFERENCE INFORMATION**
Packaging: Tray
UL File No.: E29179
Mates with: Copper Cable Assemblies (Series 74757, 111040)
Designed in: Millimeters

**ELECTRICAL**
Voltage: 30V
Current (max.): 0.5A; power contacts 1.0A
Contact Resistance (max.): 30 milliohms
Dielectric Withstanding Voltage: 500V AC
Insulation Resistance (min.): 1000 Megohms

**MECHANICAL**
Mating Force: 0.75N per circuit
Unmating Force: 0.25N 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

EMI Sheet-Metal Cages

**REFERENCE INFORMATION**
Packaging: Tray and Box
Mates with: QSFP+ Cable Assemblies (Series 74757, 111040)
QSFP+ Loopback Adapter (Series 74763)
zQSFP+ Cables (Series 111114)
Use with: Connector (Series 170432)
Designed in: Millimeters

**MECHANICAL**
Durability:
- 1 insertion to PCB
- 1-by-1 Mating Force (max.): 544N in immersion gold
- 1-by-1 Unmating Force (max.): 88N in immersion gold
- 1-by-6 Mating Force (max.): 1427N in immersion gold
- 1-by-6 Unmating Force (max.): 226N in immersion gold

**PHYSICAL**
Plating:
- Contact Area — 30µ" (0.76µm) Gold (Au)
- Signal Tail Area — Tin (Sn)
- Underplating — Nickel (Ni)
RoHS Compliant: Yes
Operating Temperature: -55 to +105°C
## Ordering Information

### 28 Gbps TempFlex Cable Assemblies

<table>
<thead>
<tr>
<th>Series No.</th>
<th>Data Rate</th>
<th>Wire Gauge</th>
<th>Lengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>100297</td>
<td>28 Gbps</td>
<td>26 AWG</td>
<td>3.0m, 3.5m, 4.0m, 5.0m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 AWG</td>
<td>0.5m, 1.0m, 1.5m, 2.0m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 AWG</td>
<td>0.5m, 1.0m, 1.5m, 2.0m, 2.5m, 3.0m</td>
</tr>
</tbody>
</table>

### SMT Connectors

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Circuits</th>
<th>Contact Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>170432-0001</td>
<td></td>
<td>0.381µm Gold</td>
</tr>
<tr>
<td>170432-0002</td>
<td>38</td>
<td>0.762µm Gold</td>
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<tr>
<td>170432-0003</td>
<td></td>
<td>Gold Flash</td>
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</tbody>
</table>

### Stacked Integrated Connectors and Cages

<table>
<thead>
<tr>
<th>Series No.</th>
<th>Port Size</th>
<th>Circuits</th>
<th>EMI Gasket</th>
<th>Light Pipe</th>
<th>Thermally Enhanced?</th>
</tr>
</thead>
<tbody>
<tr>
<td>171565</td>
<td>2-by-1</td>
<td>38 circuits per port (76 total)</td>
<td>Elastomeric</td>
<td>Arrow Up and Down</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>2-by-2</td>
<td>38 circuits per port (152 total)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-by-3</td>
<td>38 circuits per port (230 total)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>171722</td>
<td>2-by-1</td>
<td>38 circuits per port (76 total)</td>
<td>Spring-Finger</td>
<td>Arrow Up and Down</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>2-by-2</td>
<td>38 circuits per port (152 total)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-by-3</td>
<td>38 circuits per port (230 total)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>2-by-1</td>
<td>38 circuits per port (76 total)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>2-by-2</td>
<td>38 circuits per port (152 total)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### EMI Cages

<table>
<thead>
<tr>
<th>Series No.</th>
<th>Port Size</th>
<th>Cage Construction</th>
<th>Gasket Style</th>
<th>PCB Interface/Retention</th>
<th>Light Pipes</th>
<th>Heat Sink</th>
</tr>
</thead>
<tbody>
<tr>
<td>100014</td>
<td>1-by-1</td>
<td>Sheet Metal (Stainless Steel)</td>
<td>Spring Finger</td>
<td>3D Press-Fit Pin</td>
<td>Optional</td>
<td>Optional</td>
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<tr>
<td>100015</td>
<td>1-by-2</td>
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<tr>
<td>100016</td>
<td>1-by-3</td>
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<tr>
<td>100017</td>
<td>1-by-4</td>
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<tr>
<td>100019</td>
<td>1-by-5</td>
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<tr>
<td>100096</td>
<td>1-by-6</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
# Ordering Information

Optical MPO/MTP Cable Assemblies and Loopback Adapters

<table>
<thead>
<tr>
<th>Series No.</th>
<th>Component</th>
<th>Length (m)</th>
<th>Bandwidth (See Bandwidth Reference Chart Below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>106283</td>
<td>Cable Assembly</td>
<td>1.00 or 5.00m</td>
<td>Standard or High</td>
</tr>
<tr>
<td>106905</td>
<td>Loopback Adapter</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

## BANDWIDTH REFERENCE CHART

<table>
<thead>
<tr>
<th>Fiber Type</th>
<th>Overfilled Launch Bandwidth, Min (MHz-km)</th>
<th>1 Gigabit Ethernet Link Distance, Min (m)</th>
<th>10 Gigabit Ethernet Link Distance, Min (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>850nm</td>
<td>1300nm</td>
<td>850nm</td>
</tr>
<tr>
<td>Standard Bandwidth</td>
<td>500</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td>High Bandwidth</td>
<td>1500</td>
<td>500</td>
<td>900</td>
</tr>
</tbody>
</table>