Supporting next-generation 100 Gbps Ethernet and 100 Gbps InfiniBand* Enhanced Data Rate (EDR) applications, Molex’s zQSFP+ Interconnect Solution transmits up to 25 Gbps per-serial-lane data rates with excellent signal integrity (SI), electromagnetic interference (EMI) protection and thermal cooling.

Molex’s zQuad Small Form-factor Pluggable Plus (zQSFP+) interconnect solution is designed for high-density interconnect applications and conforms to SFF-8665 QSFP28. Components of the system include SMT connectors (series 170432); stacked integrated 2-by-1, 2-by-2 and 2-by-3 connectors and cages (series 171565, 171722); EMI cages (Series 111118, 111186, 100014, 100017, 100086); Optical MPO/MTP* Cable Assemblies (Series 106283); Optical MPO/MTP Loopback Adapters (Series 106005). Products scheduled for upcoming release include: copper passive cable assemblies (Series 111114); active optical cables (Series 106412).

Molex’s zQSFP+ SMT connector supports new 100 Gbps Ethernet and 100 Gbps InfiniBand* (IB) Enhanced Data Rate (EDR) applications. EDR applications consist of four lanes of high-speed differential signals with individual data rates at 25 Gbps. The preferential coupling design uses a narrow-edge coupled, blanked- and formed-contact geometry and insert molding to optimize electrical performance. The zQSFP+ connector shares the same mating interface as the QSFP+ form factor, making it backward compatible with current cable assemblies.

zQSFP+ EMI cages are designed with an advanced heat-sink system to provide a high level of heat dissipation for next-generation system-power levels. Die-cast design features screw-down option to the PCB for maximum board retention. The spring-finger design provides optimal EMI grounding and allows for more space to route high-speed traces. Single-height, spring-finger cages feature a 3D press-pin design for superior board retention.

Future low-power, integrated active optical cable (AOC) solutions will provide less expensive, reliable transport for aggregated data rates up to 100 Gbps. The singlemode fiber technology will provide long reaches of up to 4km, enabling deployment in data centers and campus environments.

*InfiniBand is a registered trademark of the InfiniBand Trade Association
† MTP is a registered trademark of US Conec Ltd.
Specifications

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

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

Optical MPO/MTP* Cable Assemblies

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 Bandwidth
Reference Chart

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

EMI Cages

Reference Information
Packaging: Tray and Box
Mates With:
  QSFP+ Cable Assemblies
  (Series 74757, 111040)
  QSFP+ Loopback Adapter
  (Series 74763)
  zQSFP+ Cables
  (Series 11114)
Use With:
  Connector (Series 170432)
Designed In: Millimeters

Mechanical
Durability:
  Die-Cast Cages: Attachment to PCB via screw-mount, enabling extensive attachments
  Sheet-Metal Cages: 1 insertion to PCB
Sheet-Metal Cages:
  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 — Die-Cast Cages
Cage and Clip Material: Stainless Steel
Plating: Nickel (Ni)
RoHS Compliant: Yes – By Exemption
Operating Temperature: -40 to +80°C

Physical — Sheet-Metal Cages
Die-Cast Cage: Aluminum
Die-Cast Heat-Sink Frame: Aluminum
Plating: Nickel (Ni)
Sheet Metal: Stainless Steel
Heat Sink: Polycarbonate
Operating Temperature: -55 to +105°C

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>850nm</td>
<td>850nm</td>
<td>850nm</td>
<td>850nm</td>
</tr>
<tr>
<td>1300nm</td>
<td>1300nm</td>
<td>1300nm</td>
<td>1300nm</td>
</tr>
<tr>
<td>Standard Bandwidth</td>
<td>500</td>
<td>600</td>
<td>86</td>
</tr>
<tr>
<td>High Bandwidth</td>
<td>1500</td>
<td>900</td>
<td>300</td>
</tr>
</tbody>
</table>

*MTP is a registered trademark of US Conec Ltd.
## Features and Benefits

| SMT Connectors (Series 170432) and Stacked Integrated Connectors and Cages (Series 171565, 171722) |
|---|---|
| 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 a very high frequency, 14 GHz |
| Proven 25 Gbps data rate with potential up to 40 Gbps per lane | Meets or exceeds current 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. Scalable for next-generation applications |
| Stacked integrated connectors include an elastomeric EMI gasket (Series 171565) or a metal EMI gasket (Series 171722) | Provides superior EMI containment and suppression |
| Identical mating interface as the QSFP+ connector for backward compatibility | Protects end user’s current QSFP+ infrastructure investment |
| Surface Mount Technology (SMT) design (series 170432 version only) | Allows for ease of routing and 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 |
| Stacked integrated connectors and cages are available in three sizes (2-by-1, 2-by-2 and 2-by-3) | Offers design options for high-density applications |
| Drop-in replacement product from TE Connectivity | Second-source option available |

| Die-Cast EMI Cages (Series 111118 and 111186) |
|---|---|
| Advanced heat-sink system | Provides a high level of heat dissipation at next-generation system-power levels |
| Die-cast frame design with reduced holes and openings | Provides optimal EMI suppression and shielding effectiveness |
| Same mechanical mating size as QSFP+ EMI cages | Provides backward compatibility with QSFP+ and QSFP modules and cable assemblies for legacy system connections |
| Through-hole-mount style to PCB with screws | Provides reliable retention to the PCB for both single-side and belly-to-belly applications |

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*InfiniBand is a registered trademark of the InfiniBand Trade Association*
### Features and Benefits

#### Sheet-Metal (Stainless Steel) EMI Cages (Series 100014, 100017 and 100086)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel cage construction</td>
<td>Offers increased robustness versus copper alloy material. Lowers material cost</td>
</tr>
<tr>
<td>3D-style press-fit pin design</td>
<td>Increased board retention versus standard press pins</td>
</tr>
<tr>
<td>Nickel-plated heat sink</td>
<td>Provides increased thermal transfer from module to heat sink</td>
</tr>
<tr>
<td>Offers up to four light pipes per port</td>
<td>Enables increased system functionality</td>
</tr>
</tbody>
</table>

#### Optical MPO/MTP* Cable Assemblies (Series 106283)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTP/MPO QSFP+ connector interface</td>
<td>Meets QSFP+ SFF-8665 interface specification</td>
</tr>
<tr>
<td>Low-profile round cable</td>
<td>Improved cable management and flexibility for routing</td>
</tr>
<tr>
<td>Standard OM3 or OM4 fiber available</td>
<td>Optimized bandwidth for each application</td>
</tr>
<tr>
<td>MPO/MTP breakout to duplex LC available</td>
<td>Allows QSFP to SFP connectivity equipment and accessories</td>
</tr>
<tr>
<td>RoHS compliant design</td>
<td>Meets EU environmental requirements for electronic equipment and accessories</td>
</tr>
</tbody>
</table>

#### Optical MPO/MTP Loopback Adapters (Series 106005)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact housing</td>
<td>Compatible with module spacing</td>
</tr>
<tr>
<td>Enclosed fibers</td>
<td>No snagging or breakage of fiber/cable during installation and handling</td>
</tr>
<tr>
<td>Loop optical transmit ports to receive ports</td>
<td>Allows loopback testing of modules, cables during burn in and field troubleshooting</td>
</tr>
</tbody>
</table>

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*MTP is a registered trademark of US Conec Ltd.*
zQuad Small Form-factor Pluggable Plus (zQSFP+) Interconnect System

zQSFP+ Stacked Integrated Connector and Cage (171565, 171722)
Optional Light Pipes

Passive Copper Cable (111114)
(available soon, contact Molex)

Active Optical Cable (106412)
(available soon, contact Molex)

zQSFP+ 1-by-4 EMI Cage (Series 111117)

zQSFP+ 1-by-4 EMI Cage (Series 111118)

zQSFP+ SMT Connector (170432)

Optical MPO/MTP* Cable (106283)

Optical MPO/MTP Loopback Adapter (106005)

Pluggable Optical Module (not provided by Molex)

† MTP is a registered trademark of US Conec Ltd.
## Applications

Telecommunication Equipment
- Hubs
- Servers
- Routers
- Switches
- Central office
- Cellular infrastructure and multi-platform service systems

Data Networking Equipment
- Servers
- Storage

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## Ordering Information

### 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>38</td>
<td>0.381μm Gold</td>
</tr>
<tr>
<td>170432-0002</td>
<td></td>
<td>0.762μm Gold</td>
</tr>
<tr>
<td>170432-0003</td>
<td></td>
<td>Gold Flash</td>
</tr>
</tbody>
</table>

### Stacked Integrated Connectors and Cages

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Port Size</th>
<th>Circuits</th>
<th>EMI Gasket</th>
<th>Light Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>171565-1002</td>
<td>2-by-1</td>
<td>38 circuits per port (76 circuits total)</td>
<td>Elastomeric</td>
<td>Arrow Up and Down</td>
</tr>
<tr>
<td>171565-0002</td>
<td>2-by-2</td>
<td>38 circuits per port (152 circuits total)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>171565-3002</td>
<td>2-by-3</td>
<td>38 circuits per port (230 circuits total)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>171722-1002</td>
<td>2-by-1</td>
<td>38 circuits per port (76 circuits total)</td>
<td>Spring-Finger</td>
<td></td>
</tr>
<tr>
<td>171722-2002</td>
<td>2-by-2</td>
<td>38 circuits per port (152 circuits total)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>171722-3002</td>
<td>2-by-3</td>
<td>38 circuits per port (230 circuits total)</td>
<td></td>
<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>Pins</th>
<th>Light Pipes</th>
<th>Heat Sinks</th>
</tr>
</thead>
<tbody>
<tr>
<td>111118</td>
<td>1-by-4</td>
<td>Die Cast</td>
<td>Elastomeric</td>
<td>Screw</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>111186</td>
<td>1-by-6</td>
<td>Sheet Metal (Stainless Steel)</td>
<td>Spring Finger</td>
<td>3D Press-Fit Pin</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td>100014</td>
<td>1-by-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100017</td>
<td>1-by-4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100086</td>
<td>1-by-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Optical MPO/MTP* Cable Assemblies and Loopback Adapters

<table>
<thead>
<tr>
<th>Series No.</th>
<th>Component</th>
<th>Length (m)</th>
<th>GBandwidth</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>106005</td>
<td>Loopback Adapter</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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www.molex.com/link/zqsfp+.html