Product Guide
Transceivers, Transponders, and Active Optical Cables
### SFP (copper and optical; longwave, shortwave and WDM)

**DATACOM** applications using Fast Ethernet, Gigabit Ethernet, 1x/2x/4x Fibre Channel

**TELECOM** applications using OC-3/STM-1, OC-12/STM-4, OC-48/STM-16, EPON/GPON and Wireless/CPRI across all reaches

**Features**
- 3.3 V operating voltage
- Distances from very short links up to 100+ km
- Wide operating temperature range
- Metal enclosure for lower EMI
- Digital diagnostics
- Wireless CPRI compliant

### QSFP+/QSFP28 (optical; longwave and shortwave)

**DATACOM** applications using 40G and 100G Ethernet and high-density 1G and 25G Ethernet

**TELECOM** applications using OTU3 and OTU4

**Features**
- Four-channel full duplex transceiver module
- Single-channel full duplex transceiver module (QSFP28 only)
- Hot-pluggable, MSA-compliant QSFP+ and QSFP28 form factors
- Maximum link length of 300m on OM3 MMF, 400m on OM4 MMF, and 40km on SMF (QSFP+ only)
- 3.3 V operating voltage
- Digital diagnostics
- Wireless CPRI compliant (LW and SW)
- I-Temp variants available

### SFP+/SFP28 (optical; longwave, shortwave, DWDM and tunable)

**DATACOM** applications using 10G and 25G Ethernet and 2x/4x/8x/10x/16x/32x Fibre Channel (LW and SW)

**TELECOM** applications using either OC-192/STM-64, 10G Ethernet, or Wireless/CPRI

**Features**
- 3.3 V operating voltage
- Supports bit rates up to 28.05 Gb/s (LW, SW, and DWDM) and 11.3 Gb/s (Tunable)
- Distances from short links up to 80 km metro (LW, SW, and DWDM) and 80km (Tunable)
- Wide operating temperature range
- Digital diagnostics
- Wireless CPRI compliant (LW and SW)
- Bi-directional SFP+ transceiver available

### QSFP-DD (optical; longwave and shortwave)

**DATACOM** applications using 400G Ethernet and high-density 50G and 100G Ethernet

**Features**
- Four- or eight-channel full duplex transceiver module
- Hot-pluggable, MSA-compliant QSFP-DD form factor
- Maximum link length of 70m on OM3 MMF, 100m on OM4 MMF, and 10 km on SMF
- 3.3 V operating voltage
- Digital diagnostics

### CFP/CFP2/CFP4/CFP8 (optical; longwave and shortwave)

**DATACOM** applications using 100G and 400G Ethernet

**TELECOM** applications using OTU4

**Features**
- Hot-pluggable, MSA-compliant CFP, CFP2, CFP4 and CFP8 form factors
- Supports 103.1 Gb/s to 425 Gb/s aggregate bit rates
- Maximum link length of 100m on OM3 MMF, 150m on OM4 MMF, 10km on SMF
- 3.3 V operating voltage

### CXP (optical; shortwave)

**DATACOM** applications using 100G Ethernet and chassis interconnections

**Features**
- Twelve-channel full duplex transceiver module
- Hot Pluggable CXP form factor
- Maximum link length of 300m on OM3 MMF and 400m on OM4 MMF
- Multirate capability: supports 1.06 Gb/s to 12.5 Gb/s per channel
### Active Optical Cables

**SFP+**
- Optical Cable for 10G and 25G Ethernet. Also available with Connectivity Diagnostics.

**Quadwire**
- 40 Gb/s to 100 Gb/s Parallel Active Optical Cable for 40GbE and 100GbE, InfiniBand 4xQDR, InfiniBand 4xFDR, InfiniBand 4xEDR, and Intel® Omni-Path Architecture. Also available with Connectivity Diagnostics.

**SFF**
- Parallel Active Optical Cable for 100GbE and InfiniBand 12xQDR.

### Optical Engines (optical; shortwave)

**DATACOM** applications for inter-chassis connections

**Features**
- Twelve-channel full-duplex transceiver modules
- Maximum link length
  - 100m at 10 Gb/s on OM3 MMF
  - 70m at 25 Gb/s on OM4 MMF
- Multirate capability: supports 1 Gb/s up to 28.1 Gb/s per channel

### Endurance Compact Transceivers (optical; longwave and shortwave)

**Features**
- Compact form-factor for high-density solutions
- Data rate flexibility including 1G and 10G Ethernet, Fast Ethernet, and 1x/2x/4x/8x/16x Fibre Channel
- Board-mounted for an edge optical interface or internal mounting
- Designed for rugged applications

### Optical Engines (optical; shortwave)

**DATACOM** applications for inter-chassis connections

**Features**
- Twelve-channel full-duplex transceiver modules
- Maximum link length
  - 100m at 10 Gb/s on OM3 MMF
  - 70m at 25 Gb/s on OM4 MMF
- Multirate capability: supports 1 Gb/s up to 28.1 Gb/s per channel

### Coherent Transceivers (optical; longwave)

**TELECOM** 100 Gb/s and 200 Gb/s applications

**Features**
- Pluggable CFP2-ACO and CFP4-ACO analog coherent optics modules
  - Highest density coherent interface
  - Enables “pay-as-you-grow” deployment of coherent optics
  - Analog interface is compatible with any external DSP
  - Modulation format independent, supports data rates > 200 Gb/s

### XFP (optical; longwave, shortwave, DWDM, and tunable)

**DATACOM** applications using 10G Ethernet and 10x Fibre Channel

**TELECOM** applications using OC-192/STM-64 and OC-48/STM-16 across all reaches

**Features**
- Supports bit rates up to 11.3 Gb/s
- Distances up to 200 km (LW, SW, and DWDM) and 80 km (Tunable)
- Digital diagnostics
- Wide operating temperature range versions available

### Finisar’s Digital Diagnostics

Finisar’s transceivers feature a microprocessor and diagnostics interface that provide performance information on the data link. Users can remotely monitor—in real-time—received optical power, transmitted optical power, laser bias current, transceiver input voltage and transceiver temperature of any transceiver in the network. These patented digital diagnostic functions provide network managers with a highly accurate, cost-effective tool for implementing reliable performance monitoring.

### Finisar’s Connectivity Diagnostics®

Several of Finisar’s products feature the Connectivity Diagnostics® suite of tools, which helps data center technicians quickly and intuitively find specific modules in a sea of sockets using a visual indicator. LynkFind® allows an operator to light up the pull-tab of the module at the far-end of a link by pressing the pull-tab of the near-end module. LynkGuardian® lights up the modules at both ends of a link when either module experiences a fault. LynkCommander® allows a network operations center to light up a module for easy identification on the data center floor. Together, these patented tools bring the intelligence normally available through data center monitoring software to a simple and intuitive visual indicator. The benefits to the data center operator enable faster installation and maintenance, easier troubleshooting, and simplified operations.
Technology Innovator.
Broad Product Portfolio.
Trusted Partner.
### Optical Engines

- **SFP+**
- **SFP28**
- **SFF**
- **XFP**
- **CFP/CFP2/CFP4/CFP8**
- **Active Optical Cables**
- **Coherent**
- **Endurance**
- **QSFP+/QSFP28**
- **SFP**

### Optical Engines

#### QSFP+/QSFP28

<table>
<thead>
<tr>
<th>Description</th>
<th>Connector</th>
<th>Bandwidth</th>
<th>Bit Rate</th>
<th>Power</th>
<th>Temperature</th>
<th>Package</th>
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<tbody>
<tr>
<td>FTFL1421P1xCL Duplex SMF 1310nm Band DFB Laser PIN 2.67 Gb/s 15 km</td>
<td>LC 2x2</td>
<td>13.5 Gb/s</td>
<td>2.67 Gb/s</td>
<td>-10 to 70</td>
<td>3.3</td>
<td>SFP+</td>
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<tr>
<td>FWLF15197Dxx</td>
<td>LC 2x10</td>
<td>15.3 Gb/s</td>
<td>500 Gb/s</td>
<td>-40 to 85</td>
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<td>CFP/CFP2/CFP4/CFP8</td>
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<td>3.7 Gb/s</td>
<td>-40 to 85</td>
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<td>SFP+</td>
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<tr>
<td>FTLX1413M3BCL Duplex SMF 1310nm Band DFB Laser PIN 11.3 Gb/s 10 km 0 to 70</td>
<td>LC 2x2</td>
<td>13.5 Gb/s</td>
<td>11.3 Gb/s</td>
<td>0 to 70</td>
<td>1.5</td>
<td>SFP+</td>
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<tr>
<td>FTLX1413D3BTL Duplex SMF 1310nm Band DFB Laser PIN 11.3 Gb/s 10 km - 40 to 85</td>
<td>LC 2x10</td>
<td>15.3 Gb/s</td>
<td>11.3 Gb/s</td>
<td>-40 to 85</td>
<td>3.3</td>
<td>CFP/CFP2/CFP4/CFP8</td>
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<tr>
<td>FTLX1413D3BCL Duplex SMF 1310nm Band DFB Laser PIN 10.5 Gb/s 10 km 0 to 70</td>
<td>LC 2x2</td>
<td>13.5 Gb/s</td>
<td>10.5 Gb/s</td>
<td>0 to 70</td>
<td>1.5</td>
<td>SFP+</td>
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<td>6.144 Gb/s</td>
<td>-40 to 85</td>
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#### QSFP-DD

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<tr>
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<th>Bit Rate</th>
<th>Power</th>
<th>Temperature</th>
<th>Package</th>
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<tbody>
<tr>
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<td>LC 2x2</td>
<td>13.5 Gb/s</td>
<td>103.1 Gb/s</td>
<td>0 to 70</td>
<td>3.3</td>
<td>SFP+</td>
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<tr>
<td>FTLC1141SDNL (CFP2) Duplex SMF 1310nm Band 4x LWDM DFB Laser PIN 112 Gb/s 10 km 0 to 70</td>
<td>LC 2x2</td>
<td>13.5 Gb/s</td>
<td>112 Gb/s</td>
<td>0 to 70</td>
<td>3.3</td>
<td>CFP</td>
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<tr>
<td>FTLC1183RDNx (CFP) Duplex SMF 1310nm Band 4x CWDM DFB Laser PIN 41.2 Gb/s 160 m 0 to 70</td>
<td>LC 2x2</td>
<td>13.5 Gb/s</td>
<td>41.2 Gb/s</td>
<td>0 to 70</td>
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<td>CFP</td>
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<tr>
<td>FTLC1183RDNx (CFP) Duplex SMF 1310nm Band 4x LWDM DFB Laser PIN 41.2 Gb/s 160 m 0 to 70</td>
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<td>41.2 Gb/s</td>
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<td>CFP</td>
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<tr>
<td>FTLC1155RGPLA (QSFP28) Duplex SMF 1310nm Band 4x CWDM DFB Laser PIN 103.1 Gb/s 10 km 0 to 70</td>
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<td>103.1 Gb/s</td>
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<td>112 Gb/s</td>
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<tr>
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<td>12 x 25 Gb/s</td>
<td>0 to 70</td>
<td>3.3</td>
<td>SFP+</td>
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<tr>
<td>FTLC4351RJPL (QSFP28) Duplex SMF 1310nm Band 1x EML PIN 103.1 Gb/s 2 km 0 to 70</td>
<td>LC 2x2</td>
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<td>103.1 Gb/s</td>
<td>0 to 70</td>
<td>3.3</td>
<td>SFP+</td>
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<tr>
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<td>SFP+</td>
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<td>FTLF8519F2xCL Duplex MMF 850nm Band VCSEL PIN 2.125 Gb/s 550 m 0 to 70</td>
<td>LC 2x2</td>
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<td>2.125 Gb/s</td>
<td>0 to 70</td>
<td>3.3</td>
<td>SFP+</td>
</tr>
</tbody>
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### Additional Information
- **Extended case temperature ranges and reaches are available upon request.**