100G Fiber Optic Transceiver
Cable Ordering Guide: Cisco Nexus
Step 1:
Choose the correct Cisco transceiver for your application

Cisco 40/100G Optics: QSFP

<table>
<thead>
<tr>
<th>Cisco Part Number</th>
<th>Reach</th>
<th>Media</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>QSFP-100G-SR4-S</td>
<td>100m</td>
<td>Parallel MMF</td>
<td>MPO</td>
</tr>
<tr>
<td>QSFP-40/100G-SRBD</td>
<td>100m</td>
<td>Duplex MMF</td>
<td>LC (40G or 100G)</td>
</tr>
<tr>
<td>QSFP-40G-SR-BD</td>
<td>100m</td>
<td>Duplex MMF</td>
<td>LC (40G only)</td>
</tr>
<tr>
<td>QSFP-100G-PSM4-S</td>
<td>500m</td>
<td>Parallel SMF</td>
<td>MPO</td>
</tr>
<tr>
<td>QSFP-100G-SM-SR</td>
<td>2km</td>
<td>Duplex SMF</td>
<td>LC</td>
</tr>
<tr>
<td>QSFP-100G-CWDM4-S</td>
<td>2km</td>
<td>Duplex SMF</td>
<td>LC</td>
</tr>
<tr>
<td>QSFP-100G-FR-S</td>
<td>2km</td>
<td>Duplex SMF</td>
<td>LC</td>
</tr>
</tbody>
</table>

**Description**

The **QSFP28 SR4-S** module supports 100GBASE-SR4 Ethernet over link lengths of up to 100m over parallel multimode fiber. The maximum reach over OM4 is 100m and 70m over OM3 MMF (Multi-Mode Fiber). The SR4-S module accepts MPO12 connectors and can interoperate with 4 individual 25G SR-S modules via a fiber breakout cable. It is primarily used in data center and enterprise applications.

The **QSFP28 40/100G** dual-rate BiDi (Bi-Directional) transceiver is a pluggable optical transceiver with a duplex LC connector interface for short-reach data communication and interconnect applications using MMF. It offers customers a solution that enables reuse of their existing 10 Gb duplex MMF infrastructure for migration to either 40 or 100 Gigabit Ethernet connectivity.

In 40G mode, the Cisco QSFP 40/100G BiDi transceiver supports link lengths of 100m and 150m on OM3 and OM4 MMF, respectively. In 100G mode, it supports 70 and 100 meters on OM3 and OM4, respectively.

Each 40/100G BiDi transceiver consists of two transmit and receive channels in the 832-918 nm wavelength range, enabling an aggregated 40G or 100G link over a two-strand multimode fiber connection.

In 100G mode, the operating temperature range is +10 to +60°C and in 40G mode it is +10 to +70°C. the QSFP28 40/100G BiDi module is primarily used in data center and enterprise applications.

The **QSFP28 PSM4-S** module supports 100G link lengths of up to 500m over parallel G.652 SMF (Single-Mode Fiber). It accepts angle-polished MPO12 connectors and can interoperate with 4 individual 25G LR-S modules via a fiber breakout cable. PSM4-S complies with the PSM4 MSA and is primarily used in data center applications.

The **QSFP28 CWDM4-S** module supports 100G link lengths of up to 2km over duplex G.652 SMF. It accepts duplex LC connectors. The 100G Ethernet signal is carried over four wavelengths on the CWDM (Coarse Wavelength Division Multiplexing) grid. Multiplexing and demultiplexing of the four wavelengths are managed within the device. CWDM4-S complies with the CWDM4 MSA and is primarily used in data center and enterprise applications.

The **QSFP28 SM-SR** is for “Single-Mode Fiber Short Reach” applications and is also known as “CWDM4-Lite”. A variant of CWMD4-S, its operating temperature range is +10 to +60°C instead of the standard commercial temperature range of 0 to 70°C.

Like CWDM4-S, SM-SR supports 100G link lengths of up to 2km over duplex G.651 SMF and accepts duplex LC connectors. However, its optical link loss budget is 4.2 dB instead of 5.0 dB as specified by the CWDM4 MSA. At 4.2 dB, the link budget offers the ability to support the optical loss from patch panels in a data center environment. SM-SR is interoperable with CWDM4-S.

The **QSFP28 FR-S** module supports 100G link lengths of up to 2km over duplex G.652 SMF. It accepts duplex LC connectors. FR-S is a single-lambda 100G optic and contains an internal processor chip that performs PAM4 (Pulse Amplitude Modulation), KP4 FEC (Forward Error Correction), and a gearbox to convert the 4x25G electrical signals from the host port to a single channel 100G optical signal.

FR-S interoperates with 400G optical interfaces such as IEEE 400GBASE-DR4, and Cisco’s 4x100G FR QSFP-DD module via fiber breakout cable. FR-S complies with the 100G-FR specification issued by the 100G Lambda MSA. It is primarily used in data center, enterprise, and service provider applications.

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**Did you know?**

- As you increase data rates, reach decreases
- Only 10% of data centers exceed 100m
- Every connection introduces dB loss which further reduces the distance

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Step 2:
Identify the enclosure system(s) that meet your application needs. Universal wired fiber cassettes provide optimal interoperability across fiber cabling systems.

For more information about universal wired fiber cassettes, see our video.

HD Flex™ Fiber Enclosures
The HD Flex™ Fiber Cabling System is the highest density solution designed to set you free by removing the barriers of architecture, deployment, scalability and maintenance challenges.

- Provides up to 144 fibers (72 duplex ports) per RU of density
- Enclosures and panels are adaptable between 4, 6 and 12-port configurations
- Split tray feature allows each half of the tray to be pulled out independently

For more information about the HD Flex™ Fiber Cabling System, reference the system brochure (FBCB46) or visit panduit.com/hdflex.

QuickNet™ Patch Panels
Panduit QuickNet™ Patch Panels provide the flexibility to deployment both copper and fiber connectivity in the same RU.

- High-density patch panels conserve valuable rack space with 96 fibers (48 duplex ports) per RU
- Available in flat or angled patch panels to facilitate proper bend radius control and minimize the need for horizontal cable managers

For more information about the QuickNet™ Fiber Cabling System, reference the QuickNet™ Data Center Application Guide (FBAG01).

Opticom™ Fiber Enclosures
Opticom™ Fiber Enclosures accept pre-terminated, splice-on, and field terminated fiber connectivity.

- Slide-out, tilt-down drawer provides up to 96 LC fibers per RU
- Integral bend radius control and cable management for fiber optic patch cords

For more information about the Opticom™ Fiber Enclosures, reference the spec sheet (RKSP39).

PanMPO™ Fiber Connector
The PanMPO™ Fiber Connector is a unique, patented MPO design that specifically addresses today’s needs for fast and efficient Ethernet and Fibre Channel migration to help maximize return on cabling infrastructure investment and minimize downtime. Protect your investments today; minimizing installed cost of high-speed data center engineered links securing your position as a next-generation data center prepared to face future demands.

- Easy migration from serial duplex (SR/SR/BiDi) to parallel (SR4.x) while maintaining compliance with cabling standards (TIA and ISO/IEC)
- Connector cleaning – the pin retraction feature allows for complete cleaning of the MPO surface
- Link certification – the gender changing ability of PanMPO™ on test leads allows for multiple test scenarios without the need for multiple test lead styles (which increase test variability)
- Mistake proofing – PanMPO™ Patch Cords can be reconfigured for gender and polarity in the field

For more information on the PanMPO™ Fiber Connector, visit panduit.com/panmpo.

Signature Core™ Fiber Optic Cabling System
Signature Core™ OM4+ and OM5+ Fiber Optic Cabling Systems extend the reach of standards-based Ethernet, BIDI, and Shortwave Wavelength Division Multiplexing (SWDM). Both are fully compliant and interoperable with standards based OM3, OM4 and OM5 solutions.

- Signature Core™ OM4+ Cabling extends reach on average by 20% compared to standard OM4
- Signature Core™ OM5+ Cabling outperforms the standard OM5 fiber for any SWDM applications, providing on average 15% extended reach while maintaining Bit Error Rate performance
- Signature Core™ Fiber Media solutions allow for design flexibility (more connectors in the channel)

For more information on the Signature Core™ Fiber Optic Cabling System, visit panduit.com/signaturecore.
Step 3:
Select the components to build out your end-to-end fiber connectivity channel.

### 100G Multimode Fiber Options for Multimode: QSFP-40/100-SRBD

<table>
<thead>
<tr>
<th>Patch Cords</th>
<th>Cassettes</th>
<th>Enclosures</th>
<th>Trunk Cable</th>
<th>Enclosures</th>
<th>Cassettes</th>
<th>Patch Cords</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC</td>
<td>HD Flex</td>
<td></td>
<td>MPO12 OM4</td>
<td>HD Flex</td>
<td></td>
<td>LC</td>
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<td>Method B (Female to Female)</td>
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<tr>
<td>QSFP-40/100G-SRBD</td>
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<td></td>
<td>FHCZO-12-10U</td>
<td>FLEX1U06</td>
<td>FHCZO-12-10U</td>
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<tr>
<td>OR</td>
<td>QuickNet</td>
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<td>FHCZO-12-10U</td>
<td>FLEX1U06</td>
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<td>FHCZO-12-10U</td>
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</table>

*Patch cords and trunk cables are available in a variety of lengths, feet or meters; select the part numbers for additional information.

### 100G Multimode Fiber Options for Multimode: QSFP-100G-SR4-S

<table>
<thead>
<tr>
<th>Interconnect</th>
<th>Fiber Adapter Panels</th>
<th>Enclosures</th>
<th>Trunk Cable</th>
<th>Enclosures</th>
<th>Fiber Adapter Panels</th>
<th>Interconnect</th>
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<tbody>
<tr>
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<td></td>
<td></td>
<td>Method B (Male to Male)</td>
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</tr>
<tr>
<td>QSFP-100G-SR4-S</td>
<td>FHMP-6-BCG</td>
<td>FLEX1U06</td>
<td>FHCZO-12-10U</td>
<td>FLEX1U06</td>
<td>FHMP-6-BCG</td>
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</tr>
<tr>
<td>QSFP-100G-SR4-S</td>
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<td>QAPP24BL</td>
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<td>FQMAP66CG</td>
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<td>QAPP24BL</td>
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</table>

*Interconnects and trunk cables are available in a variety of lengths, feet or meters; select the part numbers for additional information.

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*Patch cords are available in R = ONFR (Riser) or L = LSZH.

*^Trunk cables are available in P = OFNP (Plenum), L = LSZH or B = Euroclass B2ca.

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Step 3: Continued
Select the components to build out your end-to-end fiber connectivity channel.

### 100G Single Mode Options for: QSFP-100G-PSM4-S

<table>
<thead>
<tr>
<th>Interconnect</th>
<th>Fiber Adapter Panels</th>
<th>Enclosures</th>
<th>Trunk Cable</th>
<th>Enclosures</th>
<th>Fiber Adapter Panels</th>
<th>Interconnect</th>
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<tbody>
<tr>
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<td>FAP6128LMPO</td>
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</tbody>
</table>

*Opticom Option*  
**FastNet Option**

*Interconnects and trunk cables are available in a variety of lengths, feet or meters; select the part numbers for additional information.*

**Methods:**  
- **A:** Opticom  
- **B:** FastNet

**Interconnects are available in P = OFNP (Plenum), L = LSZH or C = Euroclass Cca.**

**Trunk cables are available in P = OFNP (Plenum), L = LSZH or B = Euroclass B2ca.**

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### 100G Single Mode Options for: QSFP-100G-SM-SR, QSFP-100G-CWDM4-S, and QSFP-100G-FR-S

<table>
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For more information on the complete Panduit Fiber Solution, reference the Fiber Solutions Quick Reference Guide (FBCB40).
For other Panduit, Cisco related resources, visit www.panduit.com/panduitciscoalliance.