

HIGH-SPEED OPTICAL TRANSCEIVERS

400G PAM4 QSFP-DD SR8, SR4 and DR4

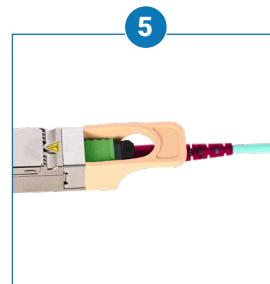
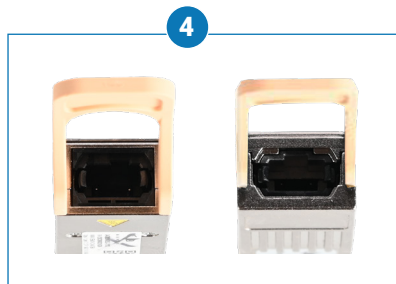
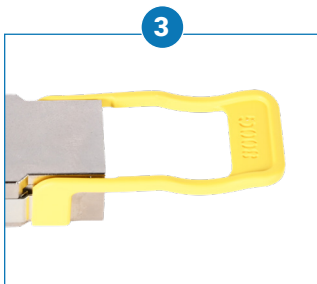
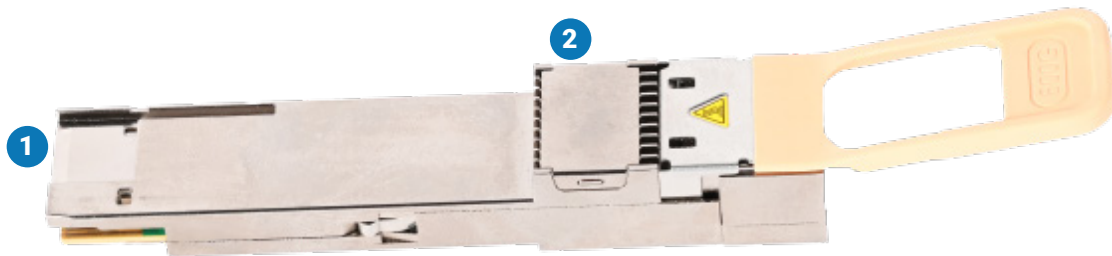
Regional Availability – Global



Siemon's 400G PAM4 DSP¹ transceivers are designed to meet and exceed industry performance standards. Each transceiver supports 50G per lane electrically (host-side) and is offered in a QSFP-DD (Double Density) form factor. These transceivers can either optically (fiber-side) support 100G per lane when utilizing a gearbox² or 50G per lane without a gearbox. Our DSP-based design is optimized for a significantly lower pre-FEC³ BER⁴, achieving error-free post-FEC performance. These transceivers support Ethernet applications and data center reaches of SR8 (Multimode), SR4 (Multimode/Gearbox), and DR4 (Singlemode/Gearbox).

Siemon PAM4 transceivers complement Siemon's portfolio of high-speed fiber and copper connectivity solutions in addition to our End-to-End fiber solutions. Our transceivers are supported by expert technical resources, ensuring reliable connectivity for today's most demanding networks.

- 1: DSP – Digital Signal Processor
- 2: Gearbox – A data-rate/lane converter for electrical and optical interfaces of a transceiver (e.g. converts 50G/L SR8 -> 100G/L SR4)
- 3: FEC – Forward Error Correction
- 4: BER – Bit Error Rate



- 1. Error-Free Post-FEC Performance
- 2. MSA Compliant Connectors
- 3. Robust Pull-Tab Color-coded by Reach
- 4. Base-8 MPO-12 APC and Base-16 MPO-16 APC Versions
- 5. Singlemode and Multimode Fiber Options

Network Equipment

- Network Interface Card (NIC)
- Accelerator Cards
- Switches
- Servers
- Storage
- Routers

Applications

- Top-of-Rack
- Rack-to-Rack
- Switch-to-Switch
- Switch-to-Server
- AI/ML Clusters

Protocol Support

- Ethernet 800GbE
 - 800GAUI-8
 - 400GAUI-4
 - 200GAUI-2
 - 100GAUI-1

Standards Compliance

- IEEE 802.3ck
- QSFP-DD MSA Rev 7.1
- CMIS 4.0*
- IEC 60825-1
- Class 1 Laser 21 CFR 1040.10 & 1040.11
- RoHS / REACH

*Compliant to CMIS 4.0. Compatible with CMIS 4.0 and above

QSFP-DD Transceiver Product Information

ABSOLUTE RATINGS

| REACH TYPE | SYMBOL | SR8 | SR4 | DR4 |
|----------------------|-----------------|----------------------------|----------------------------|----------------------------|
| STORAGE TEMPERATURE | T _c | -40 to 85°C (-40 to 185°F) | -40 to 85°C (-40 to 185°F) | -40 to 85°C (-40 to 185°F) |
| RELATIVE HUMIDITY | RH | 5 to 85% | 5 to 95% | 5 to 95% |
| SUPPLY VOLTAGE (MAX) | V _{CC} | 3.6 V | 3.6 V | 3.6 V |

OPERATIONAL SPECIFICATIONS

| REACH TYPE | SYMBOL | SR8 | SR4 | DR4 |
|--|-------------------|--|--|--|
| OPERATING CASE TEMPERATURE | T _{OPR} | 0 to 70°C (32 to 158°F) | 0 to 70°C (32 to 158°F) | 0 to 70°C (32 to 158°F) |
| SUPPLY VOLTAGE (TYP) | V _{CC} | 3.3 V | 3.3 V | 3.3 V |
| POWER CONSUMPTION (MAX) | P _{MAX} | 8.0 W | 7.0 W | 10.0 W |
| DATA RATE PER ELECTRICAL LANE | - | 50G | 50G | 50G |
| SIGNALING RATE PER ELECTRICAL LANE | SRL _{EL} | 26.5625 GBd | 26.5625 GBd | 26.5625 GBd |
| DATA RATE PER OPTICAL LANE | - | 50G | 100G | 100G |
| SIGNALING RATE PER OPTICAL LANE | SRL _{OP} | 26.5625 GBd | 53.125 GBd | 53.125 GBd |
| WAVELENGTH | λ _c | 850 nm | 850 nm | 1311 nm |
| POWER BUDGET ¹ (MIN) | PB | 2.0 dB | 1.8 dB | 3.1 dB |
| TRANSMIT OUTER OPTICAL MODULATION AMPLITUDE (OMA _{OUTER}) PER LANE | T _{OMA} | -4.5 to 3.0 dBm | -2.6 to 3.5 dBm | -0.8 to 4.2 dBm |
| RECEIVER SENSITIVITY (OMA _{OUTER}) PER LANE (MAX) | S _{OMA} | -6.5 dBm | -4.4 dBm | -4.4 dBm |
| TRANSMITTER AND DISPERSION EYE CLOSURE (TDECQ) PER LANE (MAX) | TDECQ | 4.5 dB | 4.4 dB | 3.4 dB |
| DAMAGE THRESHOLD / RECEIVER OVERLOAD (MIN) | DT | 5.0 dBm | 5.0 dBm | 5.0 dBm |
| EXTINCTION RATIO (MIN) | ER | 3.0 dB | 2.5 dB | 3.5 dB |
| BIT ERROR RATIO (BER) | BER | Pre-FEC BER = 1E-8 Post-FEC BER = 1E-15 | Pre-FEC BER = 1E-8 Post-FEC BER = 1E-15 | Pre-FEC BER = 1E-8 Post-FEC BER = 1E-15 |
| OPERATING DISTANCE (MAX) | L _{MAX} | 70m (OM3) 100m (OM4) | 30m (OM3) 50m (OM4) | 500m (OS2) |

1. Power Budget (MIN) is calculated using the minimum value from the following equation for each end of a given channel. Optical Channel Loss should not exceed this value.

$$\text{Minimum Power Budget} = \left(\text{Minimum Transmit } OMA_{OUTER} \text{ per Lane} \right) - \left(\text{Maximum Receiver Sensitivity } OMA_{OUTER} \text{ per Lane} \right)$$

MECHANICAL PROPERTIES

| CONNECTOR TYPE | QSFP-DD |
|------------------------|-----------|
| INSERTION FORCE (MAX) | 90N |
| EXTRACTION FORCE (MAX) | 50N |
| RETENTION FORCE (MAX) | 90N |
| DURABILITY (MIN) | 50 Cycles |

Additional information available upon request. Please contact our Technical Sales Group if you require further information.

Ordering Information

400G PAM4 Ethernet

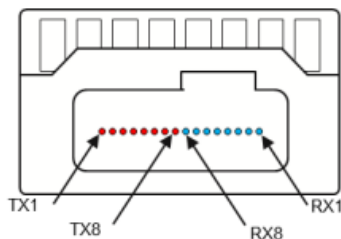
| Multimode Part Numbers | Connector Type | Reach Type | Max Length | Optical Interface |
|------------------------|----------------|------------|----------------------|--------------------|
| XCRD400SR8-3A1S | QSFP-DD | SR8 | 70m (OM3) 100m (OM4) | MPO-16/APC BASE-16 |
| XCRD400SR4-3A1G | QSFP-DD* | SR4 | 30m (OM3) 50m (OM4) | MPO-12/APC BASE-8 |

| Singlemode Part Numbers | Connector Type | Reach Type | Max Length | Optical Interface |
|-------------------------|----------------|------------|------------|-------------------|
| XCRD400DR4-3S1G | QSFP-DD* | DR4 | 500m (OS2) | MPO-12/APC BASE-8 |

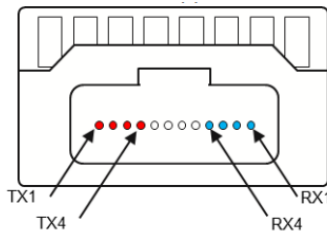
* Gearbox

Please contact our Technical Sales Group if you require connectivity or cable configurations that are not listed above. All transceivers have pinned optical connectors and require unpinned mating fiber connectors unless otherwise specified

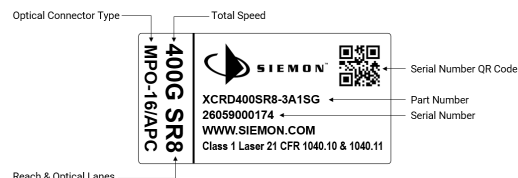
BASE-16 MPO-16 APC Versions



BASE-8 MPO-12 APC



Product Label



SCAN TO DOWNLOAD SPEC SHEET

Because we continuously improve our products, Siemon reserves the right to change specifications and availability without prior notice.

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