

# HIGH-SPEED OPTICAL TRANSCEIVERS

## 400G PAM4 QSFP112 SR4 and DR4

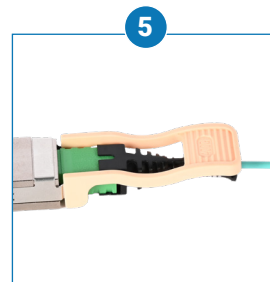
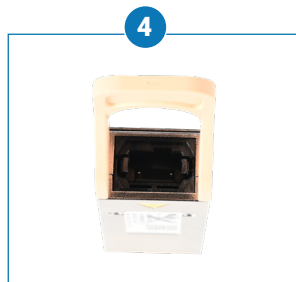
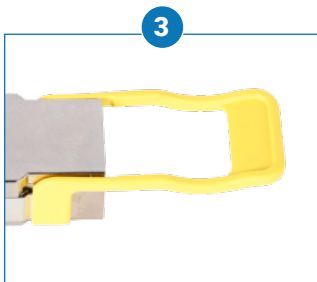
Regional Availability – Global



Siemon's 400G PAM4 DSP<sup>1</sup> transceivers are designed to meet and exceed industry performance standards. Each transceiver supports 100G per lane and is offered in a QSFP112 form factor. Our DSP-based design is optimized for a significantly lower pre-FEC<sup>2</sup> BER<sup>3</sup>, achieving error-free post-FEC performance. These transceivers support either Ethernet or InfiniBand™ protocols and data center reaches of SR4 (Multimode) or DR4 (Singlemode).

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: FEC – Forward Error Correction  
3: BER – Bit Error Ratio



### 1. Error-Free Post-FEC Performance

### 2. MSA Compliant Connectors

### 3. Robust Pull-Tab Color-coded by Reach

### 4. Base-8 MPO-12 APC

### 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 400GbE
  - 400GAUI-4
  - 200GAUI-2
  - 100GAUI-1
- InfiniBand NDR

#### Standards Compliance

- IEEE 802.3ck
- SFF-8661
- SFF-8679
- 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

# QSFP112 Transceiver Product Information

## ABSOLUTE RATINGS

REACH TYPE	SYMBOL	SR4	DR4
STORAGE TEMPERATURE	T <sub>c</sub>	-40 to 85°C (-40 to 185°F)	-40 to 85°C (-40 to 185°F)
RELATIVE HUMIDITY	RH	5 to 85%	5 to 85%
SUPPLY VOLTAGE (MAX)	V <sub>CC</sub>	3.6 V	3.6 V

## OPERATIONAL SPECIFICATIONS

REACH TYPE	SYMBOL	SR4	DR4
OPERATING CASE TEMPERATURE	T <sub>OPR</sub>	0 to 70°C (32 to 158°F)	0 to 70°C (32 to 158°F)
SUPPLY VOLTAGE (TYP)	V <sub>CC</sub>	3.3 V	3.3 V
POWER CONSUMPTION (MAX)	P <sub>MAX</sub>	8.5 W (4Lanes) 6.5 W (2 Lanes)	9.0 W (4 Lanes) 7.0 W (2 Lanes)
DATA RATE PER ELECTRICAL LANE	-	100G	100G
SIGNALING RATE PER ELECTRICAL LANE	SRL <sub>EL</sub>	53.125 GBd	53.125 GBd
DATA RATE PER OPTICAL LANE	-	100G	100G
SIGNALING RATE PER OPTICAL LANE	SRL <sub>OP</sub>	53.125 GBd	53.125 GBd
WAVELENGTH	λ <sub>c</sub>	850 nm	1311 nm
POWER BUDGET <sup>1</sup> (MIN)	PB	1.8 dB	3.1dB
TRANSMIT OUTER OPTICAL MODULATION AMPLITUDE (OMA <sub>OUTER</sub> ) PER LANE	T <sub>OMA</sub>	-2.6 to 3.5 dBm	-2.6 to 4.0 dBm
RECEIVER SENSITIVITY (OMA <sub>OUTER</sub> ) PER LANE (MAX)	S <sub>OMA</sub>	-4.4 dBm	-4.4 dBm
TRANSMITTER AND DISPERSION EYE CLOSURE (TDECQ) PER LANE (MAX)	TDECQ	4.4 dB	3.4 dB
DAMAGE THRESHOLD / RECEIVER OVERLOAD (MIN)	DT	5.0 dBm	5.0 dBm
EXTINCTION RATIO (MIN)	ER	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
OPERATING DISTANCE (MAX)	L <sub>MAX</sub>	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	QSFP112
INSERTION FORCE (MAX)	60N
EXTRACTION FORCE (MAX)	30N
RETENTION FORCE (MAX)	90N
DURABILITY (MIN)	250 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
XCRQ400SR4-3A1G	QSFP112	SR4	30m (OM3) 50m (OM4)	MPO-12/APC BASE-8

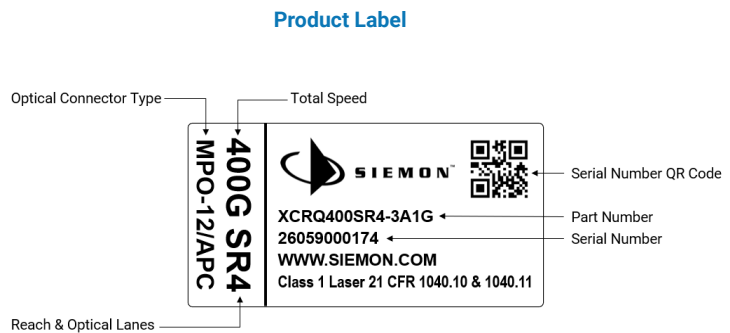
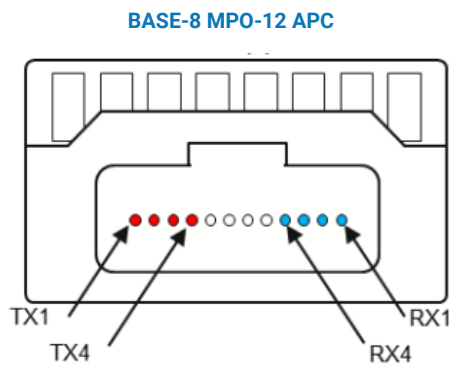
Singlemode Part Numbers	Connector Type	Reach Type	Max Length	Optical Interface
XCRQ400DR4-3S1G	QSFP112	DR4	500m (OS2)	MPO-12/APC BASE-8

## 400G InfiniBand NDR

Multimode Part Numbers	Connector Type	Reach Type	Max Length	Optical Interface
XCRQ400SR4M3A1G	QSFP112	SR4	30m (OM3) 50m (OM4)	MPO-12/APC BASE-8

Singlemode Part Numbers	Connector Type	Reach Type	Max Length	Optical Interface
XCRQ400DR4M3S1G	QSFP112	DR4	500m (OS2)	MPO-12/APC BASE-8

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



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SPEC SHEET

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

**North America**  
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**Mexico**  
P: (521) 556 387 7708/09/10

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P: (571) 657 1950/51/52

**Europe**  
P: (44) 0 1932 571771

**Asia Pacific**  
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**Siemon OEM Technologies**  
P: (1) 860 945 4213  
www.siemon.com/OEM

**China**  
P: (86) 215385 0303

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