

Q400G-112-SR4

400G QSFP112 SR4 | 850 nm | 50 m OM4

1. Product overview

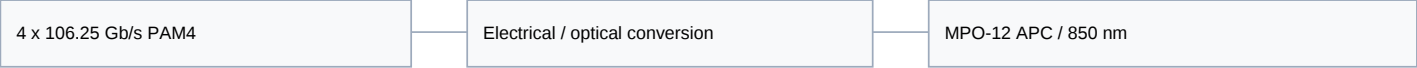
Hot-pluggable 400G QSFP112 optical module for multimode fiber (MMF). Four PAM4 lanes support 106.25 Gb/s per channel. 4 x 100G PAM4 VCSEL array; PIN receiver. Optical connectivity uses MPO-12 APC.

2. Key features

- 4-channel PAM4 architecture; MPO-12 APC optical interface
- Maximum power consumption 9 W; single +3.3 V supply
- Digital diagnostic monitoring; operating case temperature 0 to +70°C
- Reach: 50 m OM4 (see notes)

3. Applications

400GBASE-SR4 Ethernet; InfiniBand NDR; switch and router connections; data centers; other 400G interconnect requirements.



4. Technical data

Parameter	Specification
Form factor / aggregate rate	QSFP112 / 400G
Fiber / optical connector	multimode fiber (MMF) / MPO-12 APC
Power consumption	9 W max
Absolute maximum ratings	Storage -40 to +85°C; humidity 5-95%; supply -0.5 to +4.0 V.

Electrical characteristics (limits and units follow the source)

Parameter	Specification	Parameter	Specification
Supply voltage (electrical table)	3.14 to 3.47 V	TX / RX common-mode noise, RMS	17.5 mV max
Supply current / initialization	3000 mA max / 2000 ms max	TX / RX termination mismatch	10% max
TX single-ended input tolerance	-0.3 to +4.0 V	RX single-ended output voltage	0.45 V max
TX differential input swing	880 mVp-p max	RX differential output swing	900 mVp-p max

Mechanical data: Outline dimensions (mm): 16.42 ±0.08; 18.35 ±0.1; 29.6 ±0.1; 8.5 ±0.1; 1 ±0.1; 2.25 ±0.1; max 20; max 3.4; max 1.6.

Supply filter: 1 μH on each VccRx/VccTx/Vcc1 branch; 22 μF and 0.1 μF at the input and each branch. Inductor DC resistance <0.1 ohm. Host filter voltage drop counts toward DC set-point accuracy.

5. Recommended operating conditions

Parameter	Specification
Case temperature	0 to +70°C
Supply voltage (min / typ / max)	3.135 / 3.3 / 3.465 V
Transmission distance	50 m OM4 (see notes)

Apply VccRx, VccTx and Vcc1 concurrently. All GND pins are common and connect directly to the host ground plane. Connector rating: 1.5 A per pin; source note specifies 2.0 A for high module power of 15-20 W.

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6. Optical characteristics

Transmitter / common	Specification
TX / RX rate, each lane	53.125 ±100pm GBd (source notation); PAM4
Center wavelength, min/typ/max	844 / 850 / 860 nm
RMS spectral width	0.6 dB max (source unit)
Average launch power / lane	-4.6 to +4 dBm
OMA _{outer} / lane	-2.6 to +3.5 dBm
Transmitter excursion / lane	2.3 dB max
TDECQ / lane	4.4 dB max
Average TX-off power / lane	-30 dBm max
Transition time Tr, Tf	17 ps max
Extinction ratio	2.5 dB min
RIN _{12OMA}	-132 dB/Hz max
Optical return loss tolerance	12 dB max (source column)
Encircled flux	≥86% at 19 mm; ≤30% at 4.5 mm (source units)

Receiver / test conditions	Specification
Input operating wavelength	842 to 948 nm
Damage threshold / lane	5 dBm min
Average receive power / lane	-6.4 to +4 dBm
Receive OMA _{outer} / lane	3.5 dBm max
RX reflectance	-12 dB max
Sensitivity OMA _{outer} / lane	-4.6 dBm max
Stressed sensitivity OMA _{outer}	-2 dBm max
Stressed-sensitivity conditions	BER = 2.4E-4; TDECQ = 4.4

7. Digital diagnostics and management

DDM implemented. IIC fast-mode clock: 1 MHz max; clock stretching: 500 µs max; data hold time: 300 ns min. SCL pin 11 and SDA pin 12 provide the 2-wire interface.

Memory map: Page 00h lower memory: dynamic module information; bank select 7Eh, page select 7Fh. Upper memory 80h-FFh: 00h system ID/advertising; 01h revision codes/advertising; 02h module/lane thresholds; 03h user EEPROM; 04h-0Fh reserved; 20h-AFh coherent reserved; B0h-FFh custom. Bank-dependent pages 10h-1Fh: 10h channel control/masks; 11h channel state, flags and monitors; 12h diagnostics; 13h-15h WDM/FEC; 16h-17h coherent reserved; 18h-1Dh reserved; 1Eh-1Fh custom. Bank-independent NVR content applies to the whole module and does not change with bank selection.

Pin assignment: TX p/n lanes 1-4: 36/37, 3/2, 33/34, 6/5; RX p/n lanes 1-4: 17/18, 22/21, 14/15, 25/24. GND: 1,4,7,13,16,19,20,23,26,32,35,38. VccRx/Tx1: 10/29/30. Control: 8 ModSel; 9 Reset; 11 SCL; 12 SDA; 27 ModPrs; 28 IntL/RxLOS; 31 LPMode/TxDis. Additional source pins: 39/42/45/51 GND; 40/41 Tx6n/p; 43/44 Tx8n/p; 46 reserved; 47 VS1; 48 VccRx1 (+3.3 V); 49 VS2; 50 VS3.

8. Safety and regulatory

QSFP112 MSA; 400G Ethernet specifications; Class 1 laser; RoHS (ordering table).

9. Ordering information

GLOBALfiber part number	Product description
Q400G-112-SR4	QSFP112 400G-SR4 4x100Gbps PAM4, 850nm 1.8dB 50m MM MPO12/APC

10. General notes

The cover title, features and ordering table specify 50 m; repeated page headers specify 100 m. Both source values are retained. Supply range is 3.135-3.465 V in recommended conditions versus 3.14-3.47 V in the electrical table. The source uses dB for RMS spectral width, mm for encircled flux, and "±100pm" for optical signaling tolerance. The source pin table extends to pin 51 and contains inconsistent polarity/direction descriptions (including pins 33/34 and 36/37). Ordering sensitivity is < -4.6 dBm@OMA.