

# CCSFP-M-SR-MPO-850-70M-DDM

## Multi-Mode 100GBASE-SR4 QSFP28 Transceiver

### Features

- 4 channels full-duplex transceiver modules
- Transmission data rate up to 25Gbps per channel
- Support 40GE and 56GE FDR data rate
- Internal CDR circuits on both receiver and transmitter channels
- Up to 70m on OM3 and 100m on OM4 MMF
- VCSEL array transmitter and PIN array receiver
- Single 3.3V Power Supply
- Operates at 25.78125Gbps per channel
- MPO optical connector
- Digital diagnostic capabilities
- Operating Temperature:  
Standard: 0°C ~+70°C
- RoHS Compliant

### Applications

- IEEE 802.3bm 100GBASE SR4 and 40GBASE SR4
- Infiniband FDR/EDR

### Part Number Ordering Information

Part NO.	Data Rate	Fiber	Distance <sup>*Note1</sup>	Interface	Temp.
CCSFP-M-SR-MPO-850-70M-DDM	100Gb/s	MMF	70m/100m	MPO	Standard

Note1: 70m with OM3 MMF, 100m with OM4 MMF.

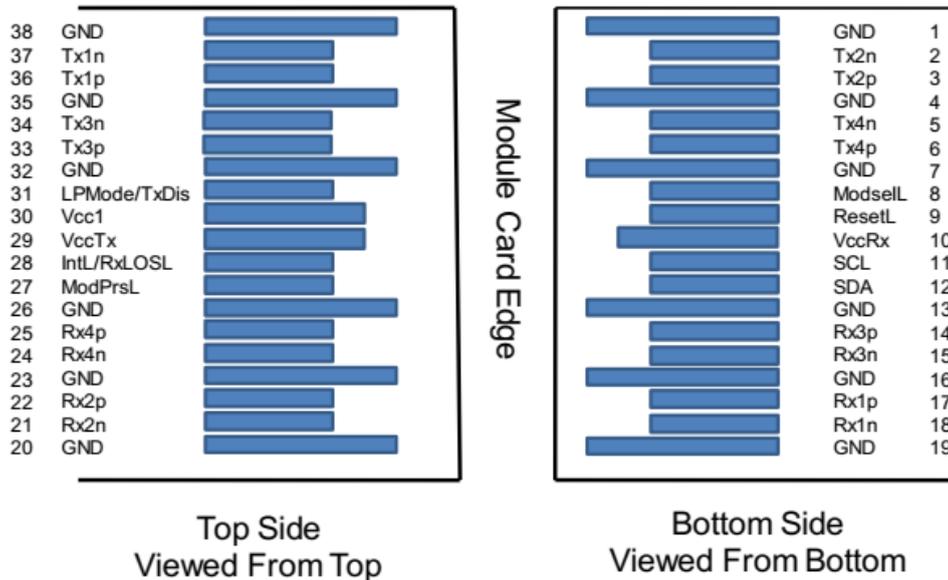
**General Description**

CCSFP-M-SR-MPO-850-70M-DDM is a parallel 100Gbps Quad Small Form-factor Pluggable (QSFP) optical module that provides increased port density and total system cost savings. The QSFP full-duplex optical module offers 4 independent transmit and receive channels, each capable of 25.78125Gbps operation for an aggregate bandwidth of 100Gbps 70m on OM3 Multimode Fiber (MMF) and 100m on OM4 MMF. CCSFP-M-SR-MPO-850-70M-DDM is designed with form factor, optical/electrical connection and digital diagnostic interface according to the QSFP Multi-Source Agreement (MSA). It has been designed to meet the harshest external operating conditions including temperature, humidity and EMI interference. The module offers very high functionality and feature integration, accessible via a two-wire serial interface.

**Electrical Connector**

The following figure shows the signal symbols and pad numbering for the module edge connector. The diagram shows the module PCB edge as a top and bottom view, where bottom is nearer the host PCB. There are 38 pads intended for high speed signals, low speed signals, power and ground connections. The module contains a printed circuit board that mates with the electrical connector. The pads are designed for a sequenced mating:

- Connected first, disconnected last: - ground contacts
- Connected second, disconnected second: - power contacts
- Connected third, disconnected first: - signal contacts



**Pin Description**

Pad	Logic	Symbol	Description	Plug Seq.	Note
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	3	
7		GND	Ground	1	1
8	LVTTL-I	ModSelL	Module Select	3	
9	LVTTL-I	ResetL	Module Reset	3	
10		VccRx	+3.3V Power Supply Receiver	2	2

11	LVCMOS-I/O	SCL	Two-wire interface clock	3	
12	LVCMOS-I/O	SDA	Two-wire interface data	3	
13		GND	Ground	1	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	1
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL	Interrupt	3	
29		VccTx	+3.3V Power supply transmitter	2	2
30		Vcc1	+3.3V Power supply	2	2
31	LVTTL-I	LPMODE	Low Power Mode	3	
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Input	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Input	3	
38		GND	Ground	1	1

Note 1: GND is the symbol for signal and supply (power) common for the module. All are common within the module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.

Note 2: VccRx, Vcc1 and VccTx are applied concurrently and may be internally connected within the module in any combination.

**Absolute Maximum Ratings**

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	T <sub>s</sub>	-40		+85	°C
Supply Voltage	V <sub>CC</sub>	-0.5		3.6	V
Relative Humidity	RH	5		85	%

**Recommended Operating Environment**

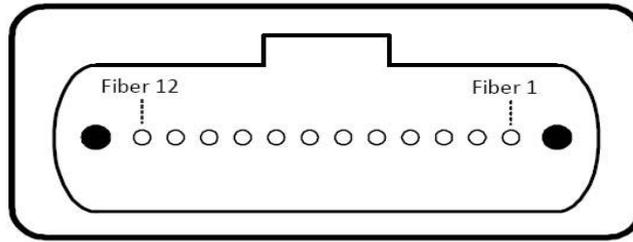
Parameter	Symbol	Min.	Typical	Max.	Unit
Case operating Temperature	T <sub>c</sub>	0		+70	°C
Supply Voltage	V <sub>CC</sub>	3.135	3.3	3.465	V
Power Dissipation	PMQPM-V4FG-M3			1.5	W

**Optical and Electrical Characteristics**

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Bit Rate Per Lane	BR		25.78125		Gbps	
Optical Wavelength	λ	840		860	nm	
<b>Transmitter</b>						
RMS Spectral Width				0.65	nm	
Average Optical Power per Channel	P <sub>avg</sub>	-8.4		2.4	dBm	
Transmit OMA, per Lane	TX_OMA	-6.4		3	dBm	
Laser Off Power Per Channel	P <sub>off</sub>			-30	dBm	
Optical Extinction Ratio	ER	3			dB	
Transmitter and dispersion penalty, each lane	TDP			3.5	dB	
Optical Return Loss Tolerance	ORL			12	dB	
Output Optical Eye	IEEE 802.3ba-2010 Compliant					
<b>Receiver</b>						
Average Receiver Power per Lane	R <sub>xp</sub>	-9.5		+2.4	dBm	
Receiver overload	Sat	+2.4				
Damage Threshold		+3.4			dBm	
Receiver Reflectance	R <sub>r</sub>			-12	dB	
LOS De-Assert	LOS <sub>D</sub>			-7.5	dBm	
LOS Assert	LOS <sub>A</sub>	-30			dBm	
LOS Hysteresis	Hy	0.5			dB	

### Optical Interface Lanes and Assignment

Below figure shows the orientation of the multi-mode fiber facets of the optical connector

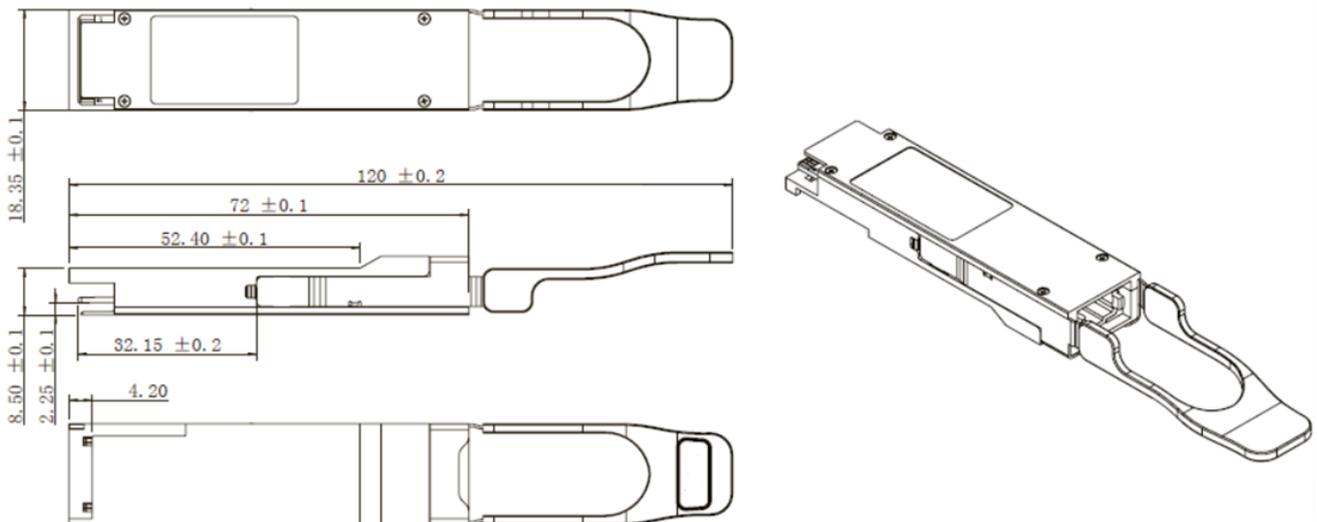


Outside View of the QSFP Module MPO

Fiber No.	Lane Assignment
1	RX0
2	RX1
3	RX2
4	RX3
5	Not Used
6	Not Used
7	Not Used
8	Not Used
9	TX3
10	TX2
11	TX1
12	TX0

Lane Assignment Table

### Mechanical Specifications



\*This 2D drawing only for reference, please check with pacific before ordering.