

Product Specification

100Gb/s QSFP28 SR4 Optical Transceiver

MT-QSFP28-SR4

Features

- Four-channel full-duplex transceiver modules Transmission data rate up to 25.78125Gbit/s per channel Up to 70m on OM3 Multimode Fiber (MMF) and 100m on OM4 MMF
- Low power consumption <2.5W Operating case temperature 0°C
- to
- 70°C
- 3.3V power supply voltage RoHS 6 compliant
- Hot Pluggable QSFP28 form factor
- MPO connector receptacle
- Built-in digital diagnostic function

Applications

- Data IEEE 802.3bm 100GBASE SR4 Proprietary High Speed Interconnections
Data center

Product description

The 100Gb/s QSFP28 SR4 is a Four-Channel, Pluggable, Parallel, Fiber-Optic QSFP28 Transceiver for IEEE 802.3bm, 100GBASE SR4 Applications. The QSFP28 full- duplex optical module offers 4 independent transmit and receive channels, each capable of 25.78125Gbps operation for an aggregate data rate of 103.125Gbps 70m using OM3 fiber. These modules are designed to operate over multimode fiber systems using 850nm VCSEL laser array. An optical fiber ribbon cable with an MPO/MTPTM connector can be plugged into the QSFP28 module receptacle. QSFP28 SR4 is one kind of parallel transceiver which provides increased port density and total system cost savings.

Regulatory Compliance

Feature	Standard	Performance
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022:2010, Class B	Compatible with standards
Electromagnetic susceptibility (EMS)	EN 55024:2010	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2	Compatible with Class I laser product

1. Absolute Maximum Ratings

The operation in excess of any absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	TS	-40	85	degC	
Relative Humidity (non-condensation)	RH	0	85	%	
Operating Case Temperature	TOP	0	70	degC	
Supply Voltage	VC	-0.3	3.6	V	
Input Voltage	Vin	-0.3	Vcc+0.3	V	

2. Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	TOP	0		70	degC	Operating Case
Power Supply Voltage	VC	3.13	3.3	3.47	V	Power Supply Voltage
Power Consumption		-		2.5	W	Power Consumption
Data Rate	DR		25.78125		Gbps	Data Rate
Data Speed Tolerance	ΔDR	-100		+100	ppm	Data Speed Tolerance
Link Distance with G.652	D	0		70	m	Link Distance with OM3

3. Electrical Characteristics

Parameter	Test Point	Min	Typical	Max	Unit	Notes
Differential input impedance	Zin	90	100	110	ohm	
Differential Output impedance	Zout	90	100	110	ohm	
Differential input voltage amplitude	ΔVin	300		1100	mVp-p	
Differential output voltage amplitude	ΔVout	500		800	mVp-p	
Bit Error Rate	BR			E-		
Input Logic Level High	VIH	2.0		VC	V	
Input Logic Level Low	VIL	0		0.8	V	
Output Logic Level High	VOH	VCC-0.5		VC	V	
Output Logic Level Low	VOL	0		0.4	V	

4. Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Center Wavelength	λC	840	850	860	nm	1
RMS Spectral Width	λrms	-		0.65	nm	1

Average Launch Power, each lane	PAVG	-		+2.4	dBm	
Optical Modulation Amplitude (OMA)	POMA	-6.4		+3	dBm	1
Difference in Launch Power between any two lanes	Ptx,diff			4.0	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane	OMA- TDP			3.5	dBm	1
Extinction Ratio	ER	3.5			dB	
Transmitter Eye Mask Margin	EMM	10			%	2
Average Launch Power OFF Transmitter, each Lane	Poff			-30	dBm	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.3, 0.38, 0.45, 0.35, 0.41, 0.5}				
Receiver						
Center Wavelength	λ_C	840	850	860	nm	
Damage Threshold	THd	3			dBm	
Overload, each lane	OVL	2.4			dBm	
Receiver Sensitivity in OMA, each	SE			-5.2	dBm	
Signal Loss Assert Threshold	LOSA	-30			dBm	
Signal Loss Deassert Threshold	LOSD			-13	dBm	
LOS Hysteresis	LOSH	0.5		6	dB	
Optical Return Loss	ORL			-12	dB	

5. Digital Diagnostic Functions

Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	3	deg	Over operating temp
Supply voltage monitor absolute error	DMI_VCC	-0.1	0.1	v	Full operating range
Channel RX power monitor absolute	DMI_RX	-3	3	d	Per channel
Channel Bias current monitor	DMI_Ibias	-10%	10%	m	Per channel
Temperature monitor absolute error	DMI_Temp	-3	3	deg	Over operating

6. Power Supply Filtering

The host board should use the power supply filtering shown in Figure1.

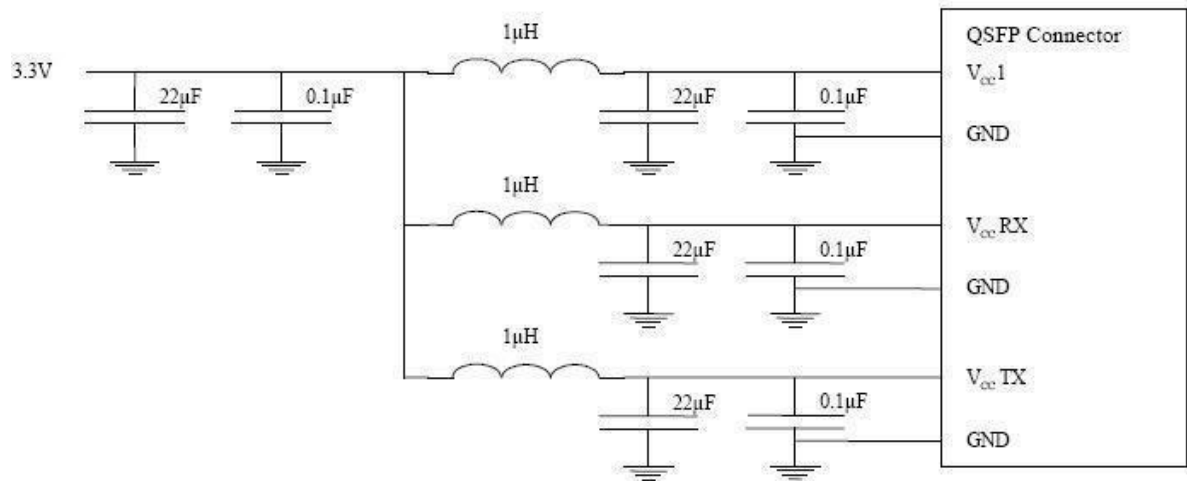
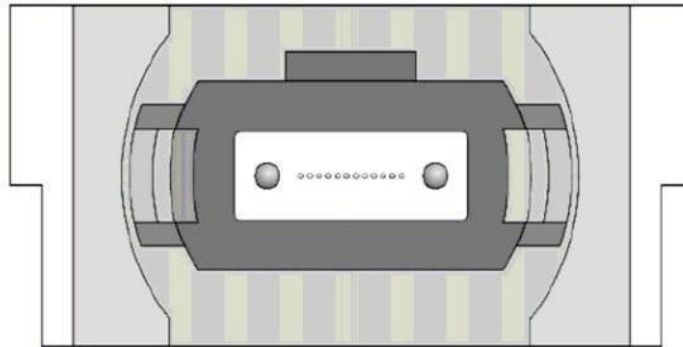


Figure1. Host Board Power Supply Filtering

7. Optical Interface Lanes and Assignment

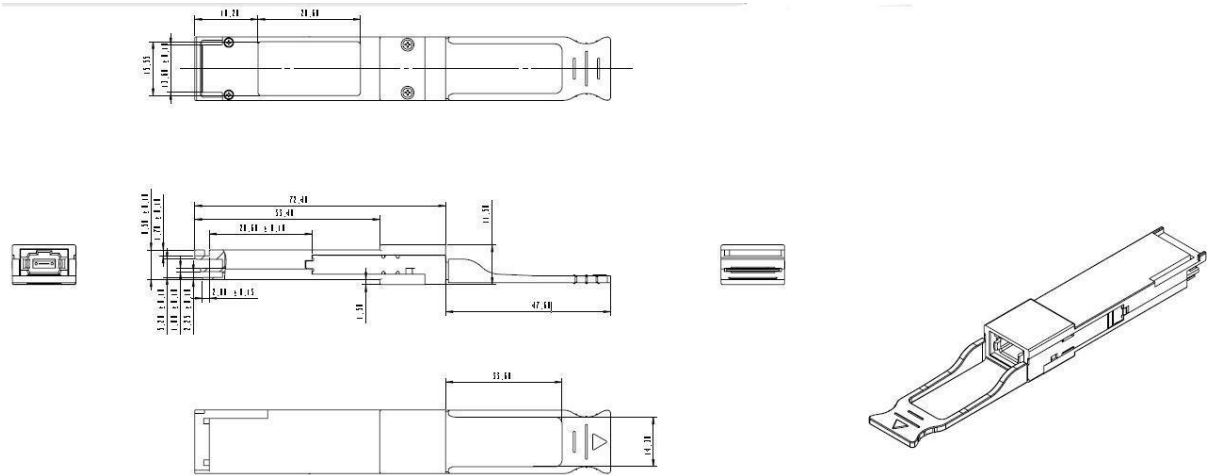
The optical interface port is a male MPO connector. The four fiber positions on the left as shown in Figure 2, with the key up, are used for the optical transmit signals (Channel 1 through 4). The fiber positions on the right are used for the optical receive signals (Channel 4 through 1). The central four fibers are physically present.



Transmit Channels: 1 2 3 4
 Unused positions: x x x x
 Receive Channels: 4 3 2 1

Figure 2. Optical Receptacle and Channel Orientation

8. Mechanical Dimensions



9. ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

10. Laser Safety

This is a Class 1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

11. Pin Assignment and Description

The diagram illustrates the pin configuration for the top and bottom views of the card edge connector. The top view shows pins 38 to 20, and the bottom view shows pins 1 to 19. The card edge is labeled 'Card Edge'.

Pin Number	Signal Name
38	GND
37	TX1n
36	TX1p
35	GND
34	TX3n
33	TX3p
32	GND
31	LPMODE
30	VCC1
29	VCCTX
28	INTL
27	MODPRSL
26	GND
25	RX4p
24	RX4n
23	GND
22	RX2p
21	RX2n
20	GND

Pin Number	Signal Name
1	GND
2	TX2n
3	TX2p
4	GND
5	TX4n
6	TX4p
7	GND
8	MODSEL
9	RESETL
10	VCCRX
11	SCL
12	SDA
13	GND
14	RX3p
15	RX3n
16	GND
17	RX1p
18	RX1n
19	GND

12. Pin Assignment

PIN #	Logic	Symbol	Description	Notes
1		GND	Ground	
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	
8	LVTLL-I	ModSelL	Module Select	
9	LVTLL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	
20		GND	Ground	
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	
30		Vcc1	+3.3 V Power Supply	
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	

13. Ordering information

Part Number	Product Description
MT-QSFP28-SR4	100Gb/s QSFP28 SR4 Optical Transceiver

4. Revision History

Revision	Date	Description
Rev A0	02/07/2017	initial release

5. For More Information

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