

40Gb/S QSFP+ PSM4 2km Transceiver

P/N: TQSFPP-CJ1D13G



Product Features

- Compliant with QSFP+ MSA
- Transmitter with 4 channel 1310nm DFB laser
- Receiver with 4 channel PIN photo detector
- Low power consumption 2W (Max.)
- Up to 11.2 Gbps data rate per channel
- Single 3.3V power supply
- 0°C to 70°C case temperature operating range
- MPO optical connector (IEC61754-7-1)
- Up to 2km reach over standard single mode fiber
- I2C management interface
- RoHS-6 Compliant

Application

- 40G Ethernet
- InfiniBand SDR, DDR and QDR
- Datacenter and Enterprise networking
- High-performance Backplane
- Switch Router and HBA's

Absolute Maximum Rating

Parameter	Min	Max	Unit	Note
Storage Temperature	-40	85	°C	
Relative Humidity	0	85	%	
Supply Voltage	0	3.8	V	
TRx Power Consumption		2	W	
Supply Current		600	mA	

Recommended Operating Conditions

Parameter	Min	Typical	Max	Unit	Note
Case Operating Temperature	0		70	°C	
Power Supply Voltage	3.15	3.3	3.45	V	
Data Rate per Channel		10.3125		Gbps	
Power Supply Noise			50	mVpp	
Data Speed Tolerance	-100		+100	mV	
Supply Noise Rejection			100	mV	
Link Distance			2	km	

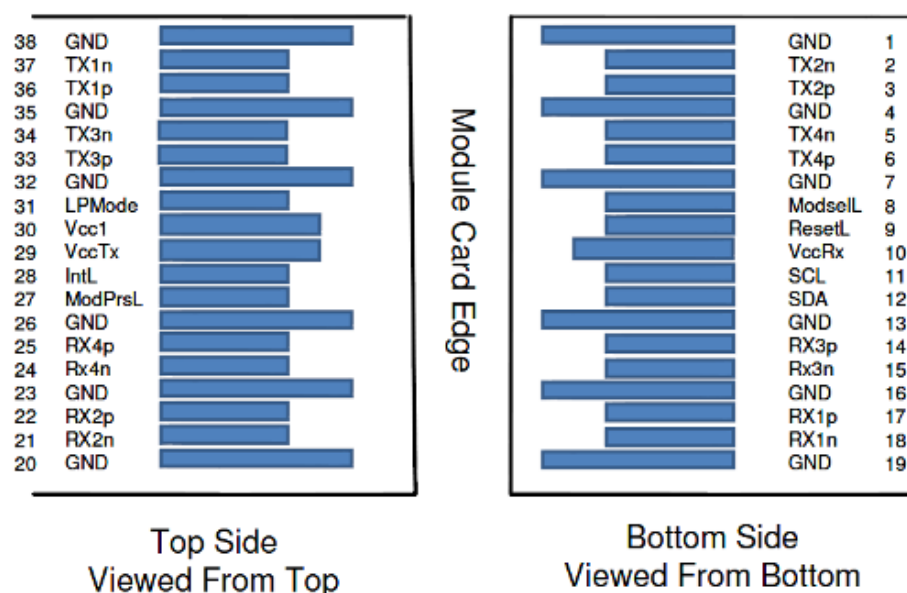
Electrical Characteristics

Parameter	Min	Typical	Max	Unit	Note
Transmitter					
Differential Input Impedance	90	100	110	Ω	
Differential Input Swing	200		800	mV	
TP1/TP1a Interface	Compliant to IEEE 802.3ba XLPPI				
Receiver					
Differential Output Impedance	90	100	110	Ω	
Differential Output Swing	400	600	850	mV	
TP4 Interface	Compliant to IEEE 802.3ba XLPPI				

Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Note
Transmitter						
Operating Wavelength, each lane	λ	1260		1360	nm	
RMS Spectral Width				1.5	nm	
Average Launch Optical Power, each lane	LOP	-8.2		+0.5	dBm	
Optical Modulation Amplitude, each lane	OMA	-5.2		+2.0	dBm	
Difference in Launch Power between any Two Lanes (OMA)	Ptx,diff			5	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TPD), each Lane		-9.7			dBm	
TDP, each lane	TDP			2.6	dB	
Average launch power of OFF transmitter, each lane	Poff			-30	dBm	
Extinction Ratio	ER	3.5			dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Optical Return Loss Tolerance	TOL			12	dB	
Transmitter Eye Mask Margin	EMM	5			%	
Receiver						
Center Wavelength	λ	1260		1360	nm	
Damage Threshold, each Lane	THd	+3			dBm	
Overload, each lane		0.5			dBm	
Receiver Sensitivity (OMA), each Lane	SEN			-12.6	dBm	
LOS Assert	LosA	-30			dBm	
LOS Deassert	LosD			-15	dBm	
LOS Hysteresis	LosH	0.5		6	dB	

QSFP+ Module Pad Assignments and Descriptions

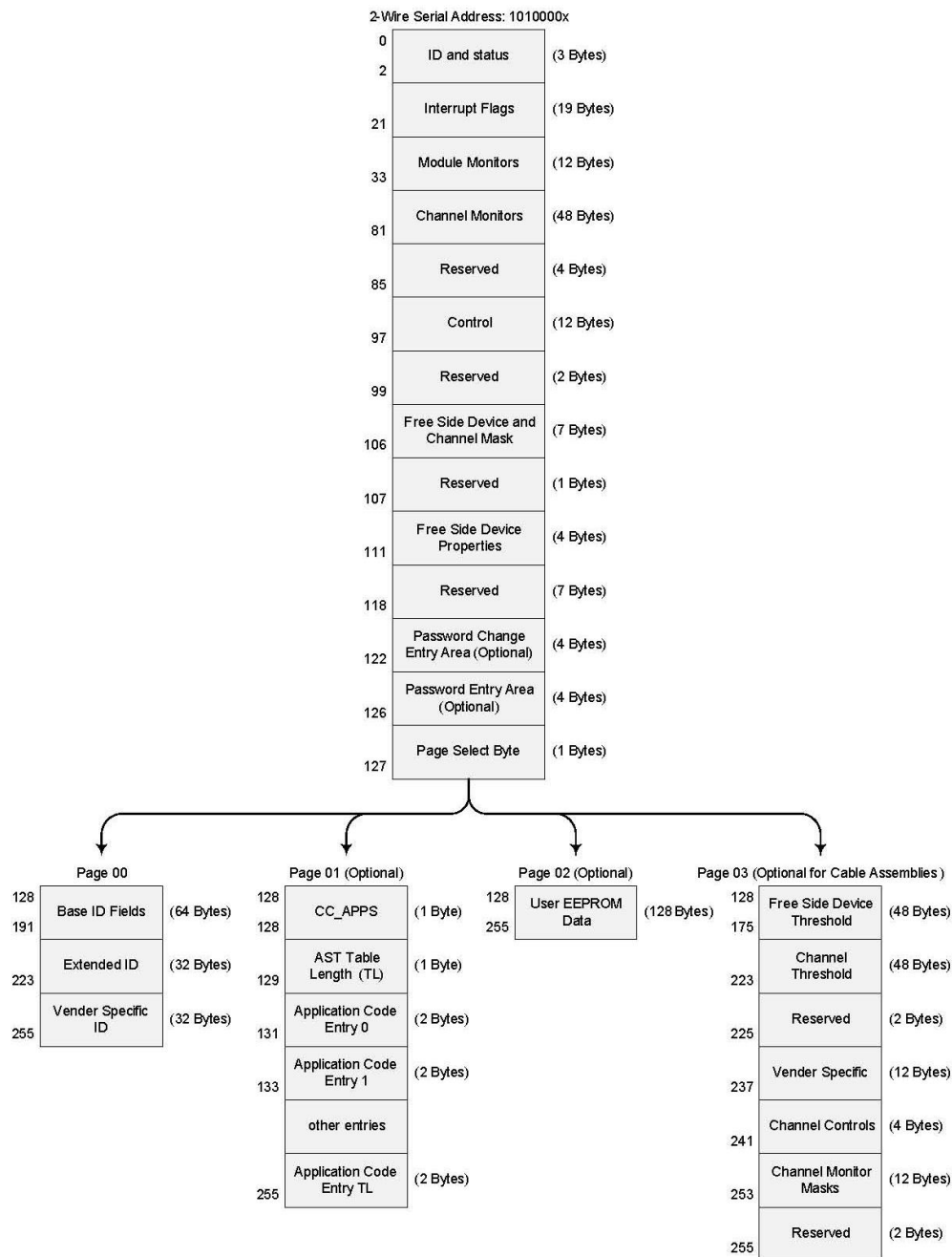


Pin	Logic	Symbol	Description	Plug Sequence
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	3
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	3
7		GND	Ground	1
8	LVTTL-I	ModSelL	Module Select	3
9	LVTTL-I	ResetL	Module Reset	3
10		Vcc Rx	+3.3V Power Supply Receiver	2
11	LVC MOS-I/O	SCL	2-wire serial interface clock	3
12	LVC MOS-I/O	SDA	2-wire serial interface data	3
13		GND	Ground	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3
15	CML-O	Rx3n	Receiver Inverted Data Output	3
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3
18	CML-O	Rx1n	Receiver Inverted Data Output	3

19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	3
28	LVTTL-O	IntL	Interrupt	3
29		Vcc Tx	+3.3V Power supply transmitter	2
30		Vcc1	+3.3V Power supply	2
31	LVTTL-I	LPMODE	Low Power Mode	3
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3
34	CML-I	Tx3n	Transmitter Inverted Data Input	3
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3
37	CML-I	Tx1n	Transmitter Inverted Data Input	3
38		GND	Ground	1

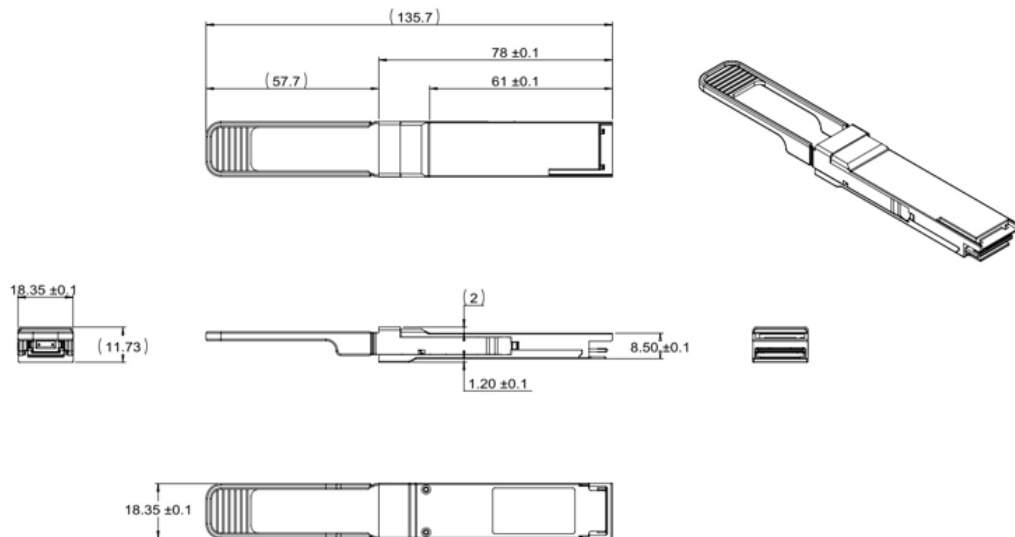
Memory Map

The memory map is structured as a single address and multiple page approaches, according to the QSFP+ SFF-8436 MSA specification as shown in the below. For more detailed description of this memory map or lower pages, please see our Memory Map document with flexible customization settings.



Mechanical Design Diagram

Unit: mm



ESD

This transceiver is specified as ESD threshold 1 kV for SFI pins and 2 kV for all others 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.

Laser Safety

This is a Class 1 Laser Product according to IEC 60825-1:1993+A1:1997+A2:2001. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007)