

SHENZHEN TIBTRONIX TECHNOLOGY CO., LTD.

# T8PMT01D

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200Gb/s QSFP56 SR4 100m Transceiver Hot Pluggable, MPT/MPO-12 Connector, Multi Mode  
4x50Gb/s VCSEL 850nm transmitter

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## Features:

- ✧ 4 VCSEL 850nm parallel design
- ✧ MPT/MPO-12 connector
- ✧ Compliant to QSFP56 MSA V2.0
- ✧ IEEE 802.3cd 200GBASE-SR4 Specification compliant
- ✧ Compliant with CMIS 4.0 or SFF8636 Management interface specifications
- ✧ 4x106.25Gb/s electrical interface (200GAUI-4)
- ✧ Up to 100m transmission on multi mode fiber (MMF OM4) with FEC
- ✧ Maximum power consumption 4W
- ✧ Single +3.3V power supply operating
- ✧ Temperature range 0°C to 70°C
- ✧ RoHS Compliant Part

## Applications:

- ✧ Networks
- ✧ Data center and Cloud

## Description:

The T8PMTH01D is a 200Gb/s QSFP56 optical module designed for 100m optical communication applications. The module converts 4 channels of 50Gb/s (PAM4) electrical input data to 4 channels of parallel optical signals, each capable of 50Gb/s operation for an aggregate data rate of 200Gb/s.

On the receiver side, the module converts 4 channels of parallel optical signals of 50Gb/s each channel for an aggregate data rate of 200Gb/s into 4 channels of 50Gb/s (PAM4) electrical output data.

An optical fiber cable with an MTP/MPO-12 connector can be plugged into the QSFP56 SR4 module receptacle. Host FEC is required to support up to 100m fiber transmission.

## ● Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	$T_S$	-40		+85	°C
Supply Voltage	$V_{CC,T,R}$	-0.5		4	V
Relative Humidity	RH	10		95	%

## ● Recommended Operating Environment:

Parameter	Symbol	Min.	Typical	Max.	Unit
Case operating Temperature	$T_C$	0		+70	°C
Supply Voltage	$V_{CC,T,R}$	+3.13	3.3	+3.47	V
Supply Current	$I_{CC}$			1200	mA
Power Dissipation	PD			8	W
Pre-FEC Bit Error Ratio				$2.4 \times 10^{-4}$	
Link Distance over OM4				100	m

## ● Electrical Characteristics ( $T_{OP} = 0$ to $70$ °C, $V_{CC} = 3.13$ to $3.47$ Volts)

Parameter	Symbol	Min	Typ	Max	Unit	Note
Data Rate per Channel		-	26.5625		Gbps	
Differential termination mismatch				10	%	
<b>Transmitter</b>						
Single Ended Output Voltage Tolerance		0.3		4	V	
Transmit Input Diff Voltage	$V_I$	900			mV	
<b>Receiver</b>						
Single Ended Output Voltage Tolerance		0.3		4	V	
Rx Output Diff Voltage	$V_O$			900	mV	
Near-end ESMW(Eye symmetry mask width)			TBD		UI	
Rx Output Rise and Fall Voltage	$T_r/T_f$		TBD		ps	1

Note: 1. 20 ~ 80%

## ● Optical Parameters( $T_{OP} = 0$ to $70$ °C, $V_{CC} = 3.0$ to $3.6$ Volts)

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
<b>Transmitter</b>						
Modulation Format			PAM4			
Data Rate per Channel		-	26.5625		Gbps	
Lane Wavelength Range			850		nm	

Average Optical Power each lane	P <sub>o</sub>	-6.5		4	dBm	
RMS Spectral Width				0.6	nm	
Optical Modulation Amplitude (OMA), each lane		-6.5		4	dBm	
Outer Optical Modulation Amplitude (OMA <sub>outer</sub> ), each lane		-4.5		3	dBm	
Launch power in OMA <sub>outer</sub> minus TDECQ		-5.9			dBm	
Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane				4.5	dB	
Extinction Ratio	ER	3			dB	
Transmitter Transition Time, Each Lane				17	ps	
Average Launch Power OFF Transmitter, each Lane	P <sub>off</sub>			-30	dBm	
Relative Intensity Noise	R <sub>in</sub>			-131	dB/HZ	1
Optical Return Loss Tolerance		-	-	12	dB	
<b>Receiver</b>						
Modulation Format			PAM4			
Data Rate per Channel		-	26.5625		Gbps	
Lane Wavelength Range			850		nm	
Damage Threshold	TH <sub>d</sub>	5			dBm	1
Average Receive Power, each Lane	R	-6.5		4	dBm	
Outer Optical Modulation Amplitude (OMA <sub>outer</sub> ), each lane		-4.5		3	dBm	
Launch power in OMA <sub>outer</sub> minus TDECQ		-5.9			dBm	
Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane				4.5	dB	
RSSI Accuracy		-2.5		2.5	dB	
Receiver Reflectance	R <sub>rx</sub>			-12	dB	
LOS De-Assert	LOS <sub>D</sub>			-10	dBm	
LOS Assert	LOS <sub>A</sub>	-20			dBm	
LOS Hysteresis	LOS <sub>H</sub>	1.5			dB	

Note: 1. 12dB Reflection

## ● Pin Assignment

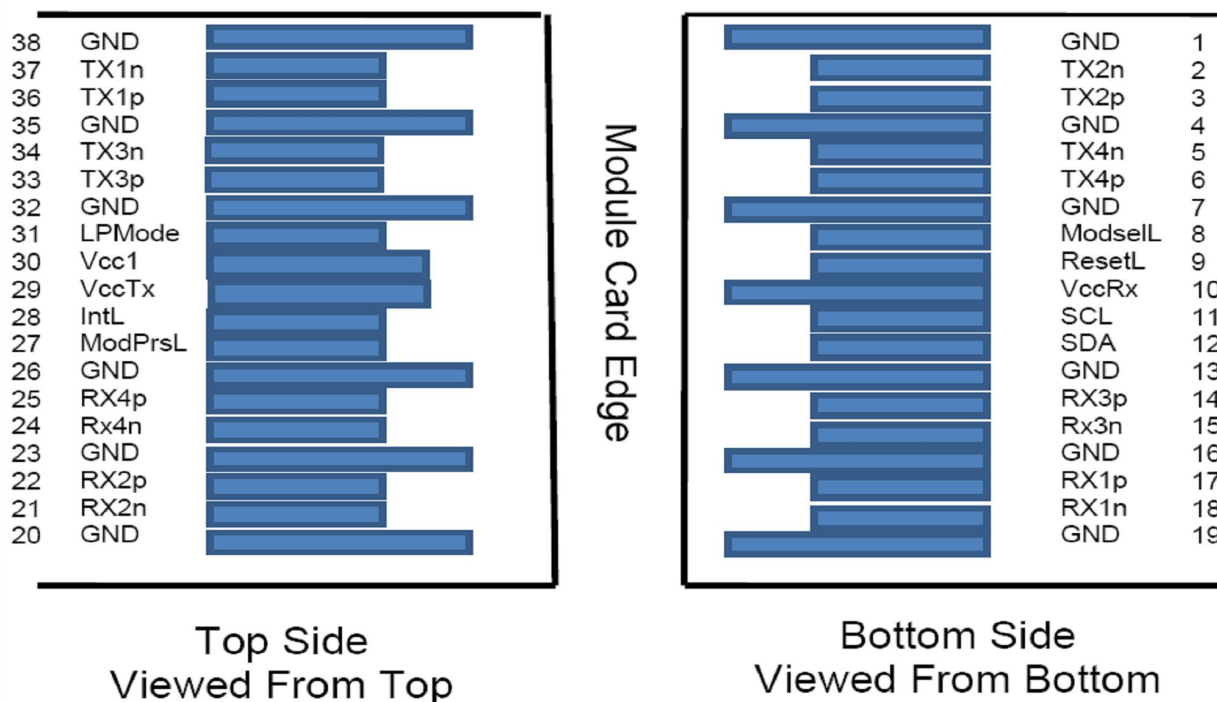


Diagram of Host Board Connector Block Pin Numbers and Name

## ● Pin Description

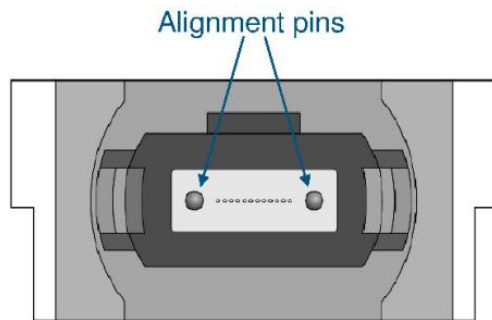
Pin	Logic	Symbol	Name/Description	Ref.
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Output	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Output	
7		GND	Ground	1
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	1
14	CML-O	Rx3p	Receiver Inverted Data Output	
15	CML-O	Rx3n	Receiver Non-Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Inverted Data Output	

18	CML-O	Rx1n	Receiver Non-Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3V Power Supply Transmitter	2
30		Vcc1	+3.3V Power Supply	2
31	LVTTL-I	LPMODE	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Inverted Data Output	
34	CML-I	Tx3n	Transmitter Non-Inverted Data Output	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Inverted Data Output	
37	CML-I	Tx1n	Transmitter Non-Inverted Data Output	
38		GND	Ground	1

**Notes:**

1. GND is the symbol for single and supply(power) common for QSFP28 modules, All are common within the QSFP28 module and all module voltages are referenced to this potential otherwise noted. Connect these directly to the host board signal common ground plane. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
2. VccRx, Vcc1 and VccTx are the receiver and transmitter power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown below. VccRx, Vcc1 and VccTx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for maximum current of 500mA.

## ● Optical interface

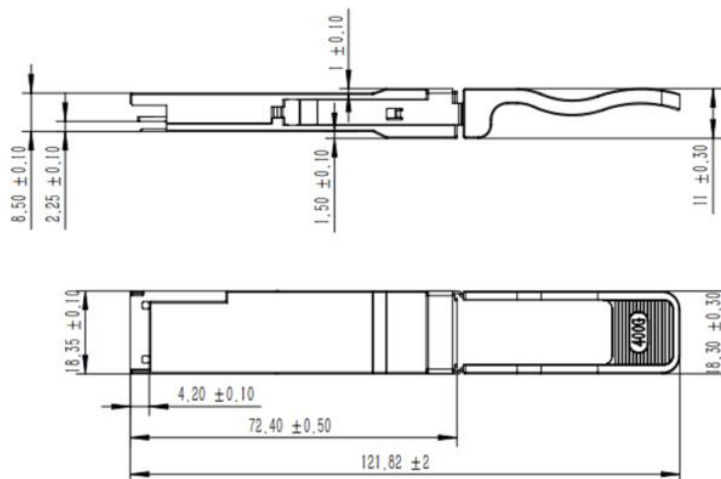


Transmit Channels: 1 2 3 4  
 Unused positions: x x x x  
 Receive Channels: 4 3 2 1

## ● Mechanical Dimensions

Unit : mm

Pull tab color : Beige



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