

Asterfusion 100G QSFP28 PSM4 MPO12 SMF 2km Optical Transceiver

Features

- 4x25.78125Gb/s electrical interface
- Uncooled 4x25.78125Gb/s CWDM transmitter
- Maximum 2km on SMF
- Power consumption <3.5W
- BER < 5E-5@-10.5dBm (OMA)
- Hot Pluggable QSFP28 form factor
- MPO-12 connector receptacle
- DML transmitter
- PIN/TIA optical receiver
- Built-in CDR
- Built-in digital diagnostic functions
- Compliant with CMIS
- +3.3 V power supply
- Operating case temperature 0°C to +70°C
- RoHS 6 compliance

Overview

The 100G PSM4 QSFP28 transceiver. optical transceiver is intended for up to 2km reach service with four-lane 25.78125G data rate. It is based on 3.3V DC power supply and operates in the commercial temperature range. It is compliant with QSFP MSA, SFF-8436, SFF-8636 and PSM4 MSA. The transceiver incorporates a four-laser array which is usually DFB, four-PIN diode array, a high-performance CDR integrated four drivers and TIAs IC separately. The differential AC coupled Tx and Rx data interfaces are CML compatible. Digital diagnostic

functions are available via I2C interface. It fully complies with the Common Management Interface Specification (CMIS).

Product Applications

- AI Inference Fabric
- Data Center Fabric
- HPC Fabric
- Campus Spine-Leaf connection
- High-speed Servers
- High-speed WAN connection
- 5G xHaul
- Telecom WAN/MAN
- Ethernet Storage Fabric

Networking

The transceiver can connect to another transceiver with the same specifications.



Figure 1 Connect two 100G-port switches

Specifications

Electrical Specifications

Transmitter Electrical Characteristics						
Parameter	Symbol	Mi	Typ	Max	Unit s	Notes
Differential Data input Swing	VIN	180		900	mV	
Tx Differential Input Impedence	Zin	90	100	110	Ω	
Tx Differential Output Impedence	Zout	45	50	55	Ω	
ResetL Disable Voltage	V _r	2.0		V _{CC} +0.3	V	
ResetL Enable Voltage	V _{rEN}	0		0.8	V	
ModSelL Disable Voltage	V _m	2.0		V _{CC} +0.3	V	
ModSelL Enable Voltage	V _{mEN}	0		0.8	V	
Receiver Electrical Characteristics						
Parameter	Symbol	Min	Typ	Max	Unit s	Notes
Differential Data Output Swing	VOUT	180		900	mV	
Rx Differential Output Impedence	ZOUT	90	100	110	Ω	
IntL Assert Voltage	VInt	V _{CC} -0.5		V _{CC} +0.3	V	
IntL De-assert Voltage	VDInt	0		+0.4	V	

Optical Characteristics

Transmitter Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes
Signal Rate Each Lane			25.78125±100ppm		Gbps	
Lane Wavelength	L0	1295	1310	1325	nm	
	L1	1295	1310	1325	nm	
	L2	1295	1310	1325	nm	
	L3	1295	1310	1325	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	Ptol			8.5	dBm	
Average Launch Power Each Lane	Pavg	-6.5		2.5	dBm	
Optical Modulation Amplitude Each Lane	OMA			2.5	dBm	
Transmitter and dispersion penalty Each Lane	TDP			2.2	dB	
Eye Mask coordinates: X1, X2, X3, Y1, Y2, Y3		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				[1]
Average launch power of OFF transmitter Each Lane				-30	dBm	
Extinction Ratio	ER	3.5			dB	
Spectral Width _{20dB}				1	nm	
Transmitter Reflectance				-12	dB	
Optical return loss tolerance				20	dB	

Note:

1. Hit ratio of 5e-5, per IEEE.

Receiver Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes
Signal Speed Per Lane			25.78125±100ppm		Gbps	
Lane Wavelength	L0	1295	1310	1325	nm	
	L1	1295	1310	1325	nm	
	L2	1295	1310	1325	nm	
	L3	1295	1310	1325	nm	
Damage threshold Each Lane	THd			3.0	dBm	[1]
Average Receive Power Each Lane		-10.6		2.5	dBm	[2]
Sensitivity OMA Each Lane	Sen			-10.5	dBm	[2]
Receiver reflectance				-26	dB	
LOS Assert	LOSA	-24				
LOS Deassert	LOSD			-11.6		
LOS Hysteresis	LOSH	0.5		6		

Note:

1. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.
2. Measured with conformance test signal at receiver input for BER = 5e-5 BER.

Optical Interface Lanes and Assignment

The optical interface port is an MPO-12 receptacle. The transmit and receive optical lanes shall occupy the positions depicted in Figure 2.

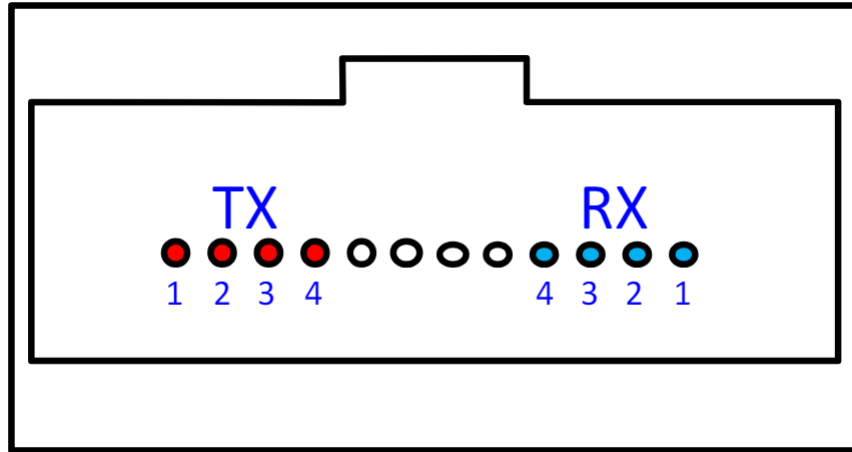


Figure 2 Optical Receptacle and Channel Orientation

Mechanical Dimensions

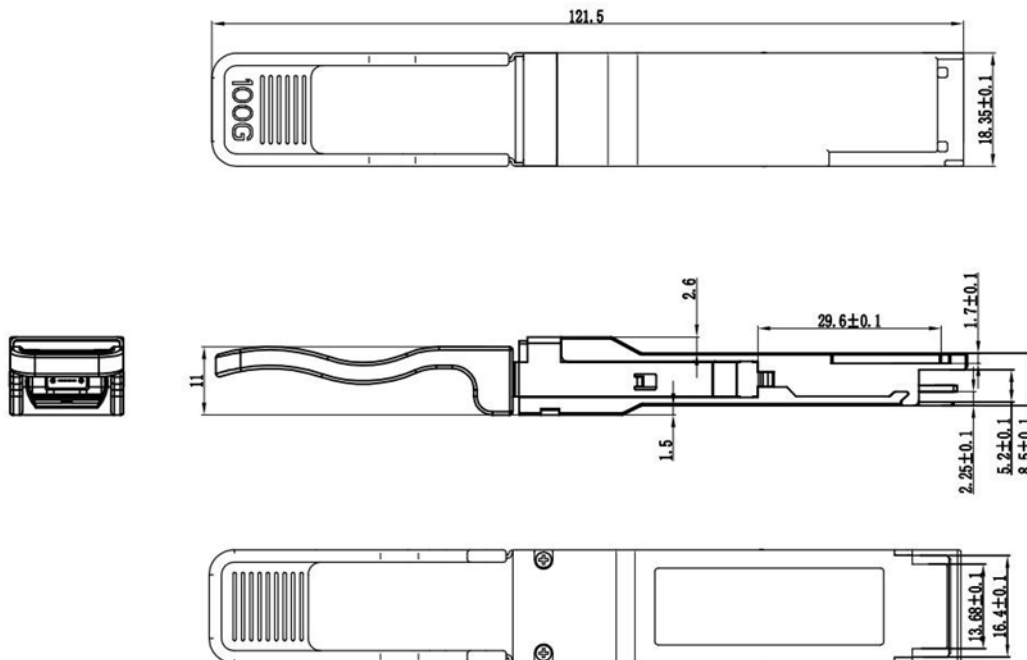


Figure 3 Mechanical Specifications (mm)

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-40	+95	°C	Exceeding the absolute maximum ratings may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous absolute maximum ratings, which may cause irreversible damage to the device.
Case Operating Temperature (Commercial)	TO	0	+70	°C	
Relative Humidity - Storage	RHS	0	95	%	
Relative Humidity - Operating	RHO	0	85	%	
Supply Voltage	VCC	-0.3	3.6	V	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units	Notes
Case Operating Temperature	Tcase	0		+70	°C	
DC Supply Voltage	VCC	3.135		3.465	V	
Module Supply Current	IIN			1060	mA	

PIN Description

It complies with the 100G CWDM4 MSA Specification, see <https://cwdm4-msa.org> .

QSFP28 Pin Description

PIN	Logic	Symbol	Name/Description	Note
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	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		VccRx	+ 3.3V Power Supply Receiver	
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	
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	

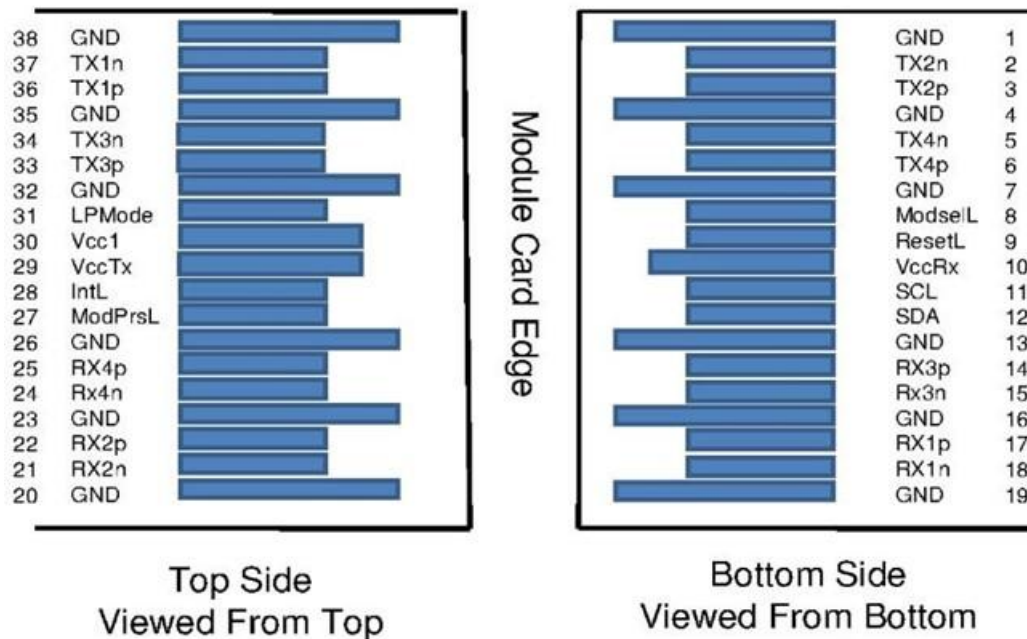


Figure 4 Electrical Pin-out Details

Digital Diagnostic Specification

Parameter	Accuracy	Unit
Internally measured transceiver temperature	+/-3	deg.C
Internally measured transceiver supply voltage	+/-3	%
Measured Tx bias current	+/-10	%
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB

Order Information

Part Number	Description
OT-100G-QSFP-PSM4	100G, QSFP28, PSM4, MPO-12, SMF 1310nm, 2km

Warranty and Service Support

Asterfusion optical transceivers come with 2-year Basic H/W service and warranty.

To acquire more info about company, products, and solutions: www.cloudswit.ch
Sales: bd@cloudswit.ch
Business Hotline: +86-0512-62982976

