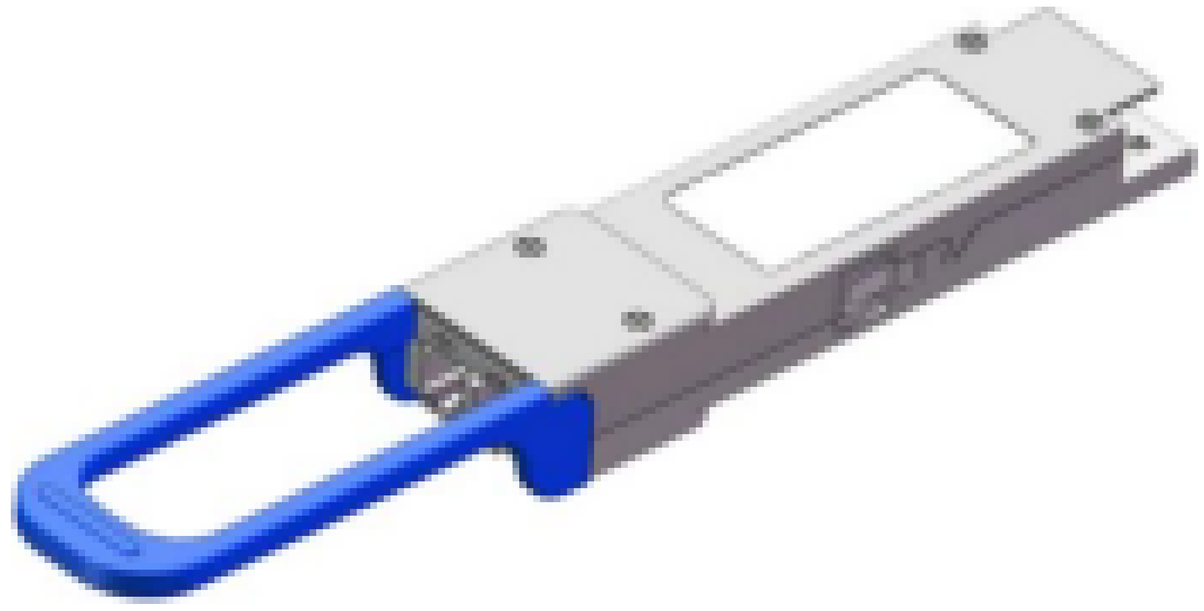
QSFP28-LR1-10-100

100G QSFP28 LR1 10km Transceivers

allmon
Telecomunicações e TI



FEATURES:

- Supports 100GBASE-LR1;
- Lane bit rate 103.125~106.25 Gb/s with PAM4;
- Up to 10km transmission on SMF;
- 1310nm EML laser and PIN receiver;
- 4x25.78Gb/s with NRZ electrical interface (CAUI-4);
- I2C interface with integrated Digital Diagnostic monitoring;
- QSFP28 MSA package with LC duplex connector;
- Single +3.3V power supply;
- Maximum power consumption 4.5 W;
- Operating case temperature: 0 to +70 °C;
- Compliant to 802.3cu, SFF-8636&SFF-8679 standard;
- Complies with EU Directive 2015/863/EU;

APPLICATIONS:

- 100GBASE-LR1;
- Data center / Cloud application;
- Other applicatio

Order Information

Part Number	From Factor	Data Rate	Media	Distance (km)	Wavelength (nm)	Temperature (℃)	DDMI
QSFP28-LR1-10	QSFP28	103.125~106.25 Gbps	SMF	10 KM	1310nm	0~70	Y

Absolute Maximum Rating

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	Ts	-40	-	+85	°C	
Supply Voltage	Vcc	0	-	+3.6	V	
Operating Relative Humidity	RH	5	-	+85	%	

Recommended Operating Condiitions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T_C	0	-	+70	°C	
Power Supply Voltage	V_{CC}	3.13	3.3	3.47	V	
Power Supply Current	I_{CC}	-	-	1.36	A	
Maximum Power Dissipation	P_D	-	-	4.5	W	
Lane Bit Rate	BR_{LANE}	-	103.125	106.25	Gb/s	With PAM4
Transmission Distance	TD	-	-	10	km	Over SMF

Optical Characteristics

Transmitter						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Center Wavelength	λ	1304.5	1311	1317.5	nm	
Average Launch Power	P_{TX_LANE}	-1.4	-	4.5	dBm	1
OMA_{outer}	OMA	0.7	-	4.7	dBm	2
Launch power in OMA_{outer} minus TDECQ	OMA - TDECQ	-0.7	-	-	dB	ER≧4.5 dB
		-0.6	-	-	dB	ER<4.5dB
Transmitter and dispersion eye closure for PAM4 (TDECQ)	TDECQ	-	-	3.4	dB	
Average Output Power (Laser Turn off)	$P_{OUT-OFF}$	-	-	-15	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	3.5	-	-	dB	
Receiver						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Center Wavelength	λ	1304.5	1311	1317.5	nm	
Damage threshold	Pdamage	5.5	-	-		
Average Rx Power	P_{RX_LANE}	-7.7	-	4.5	dBm	3
Receiver power (OMA_{outer})	P_{OMA_LANE}	-	-	4.7	dBm	
Receiver sensitivity (OMA_{outer})	SEN_{OMA}	-	-	-6.1	dBm	4

Notes:
1. The optical power is launched into SMF.
2. Even if the TDECQ<1.4dB for an extinction ratio of >=4.5dB or TDECQ<1.3dB for an extinction ration of <4.5dB, the OMAouter (min) must exceed this value.
3. Average receive power, each lane (min) is informative and not the principal indicator of signal strength.
4. Receiver sensitivity (OMAouter),each lane (max) is informative and is defined for a transmitter with SECQ up to 3.4 dB

Electrical Characteristics High-Speed Signal:

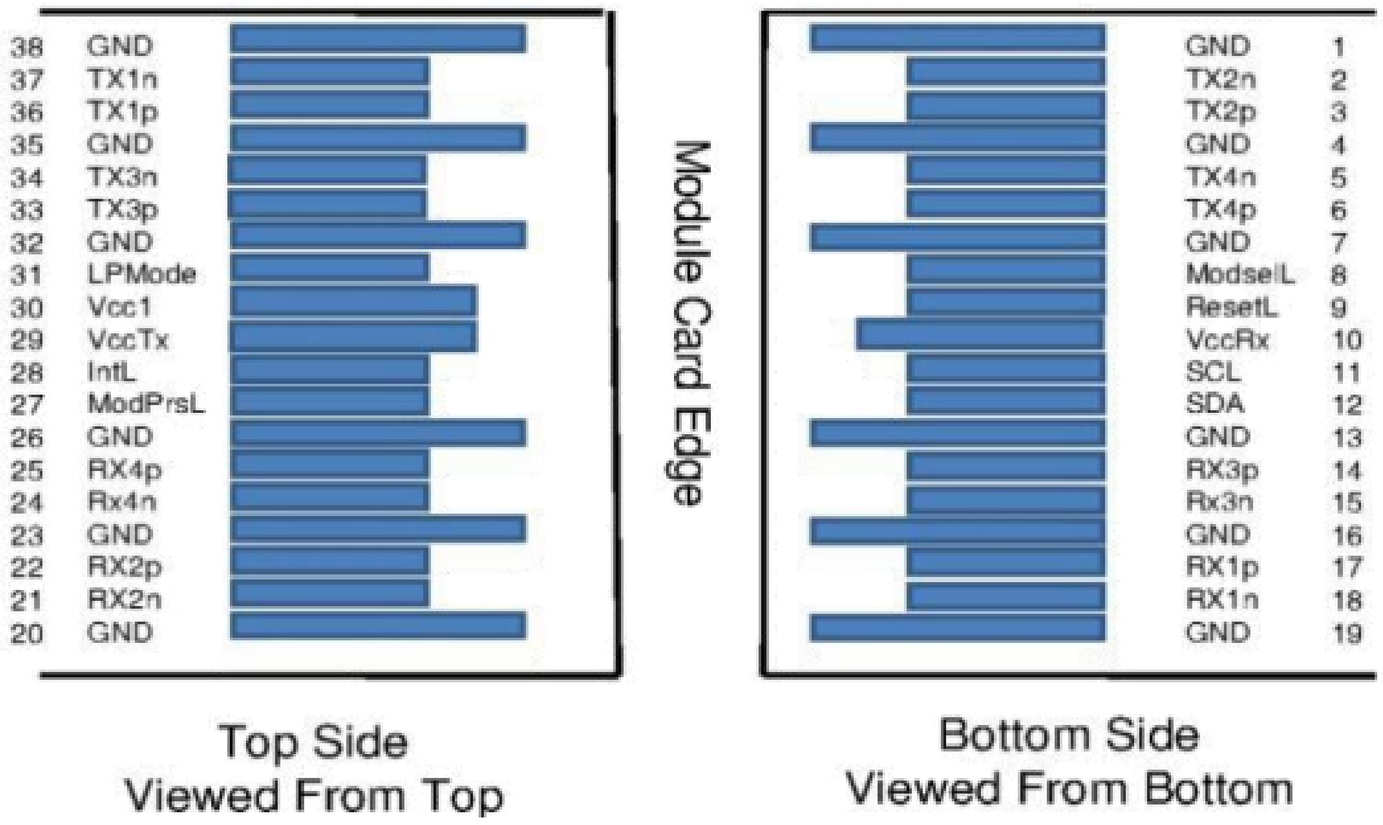
Compliant to CAUI-4 (IEEE 802.3bm)
Low-Speed Signal: Compliant to SFF-8679

Transmitter (Module Input)						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Differential Data Input Amplitude	$V_{IN,P-P}$	85	-	900	mVpp	
Differential Termination Mismatch		-	-	10	%	
LPMode, Reset and ModSelL, V in low	V_{IL}	-0.3	-	0.8	V	
LPMode, Reset and ModSelL, V in high	V_{IH}	2.0	-	V_{CC}+0.3	V	
Receiver (Module Output)						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Differential Data Output Amplitude	$V_{OUT,P-P}$	200	-	900	mVpp	
Differential Termination Mismatch		-	-	10	%	
Transition time, 20% to 80%	Tr Tf	12			ps	
ModPrsL and IntL, V out low	V_{OL}	0	-	0.4	V	
ModPrsL and IntL, V out high	V_{OH}	V_{CC}-0.5	-	V_{CC}+0.3	V	

Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	°C	Internal
Voltage	0 to V_{CC}	±3%	V	Internal
Tx Bias Current	0 to 100	±10%	mA	Internal
Tx Output Power	-1.4 to 4.5	±3	dB	Internal
Rx Input Power	-12 to 4.5	±3	dB	Internal

PIN DEFINITIONS



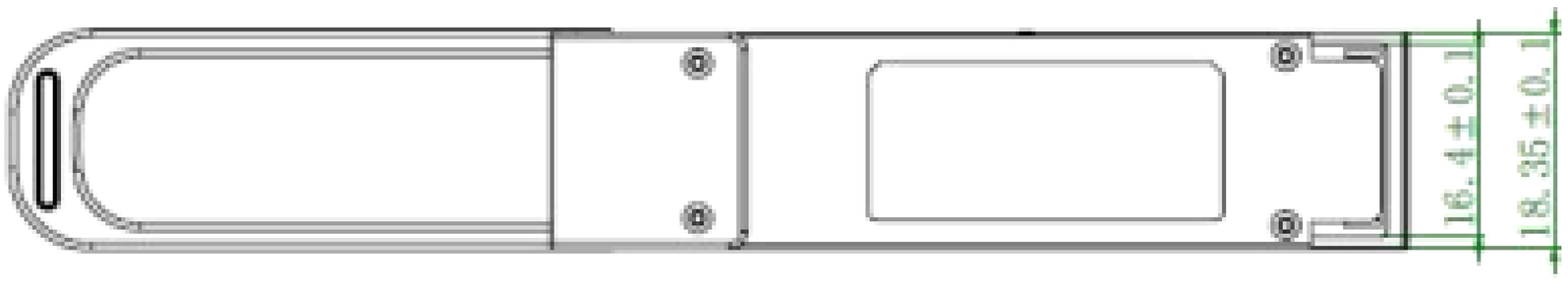
PIN	Logic	Symbol	Description	Plug Seq.	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	3	
7		GND	Ground	1	1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

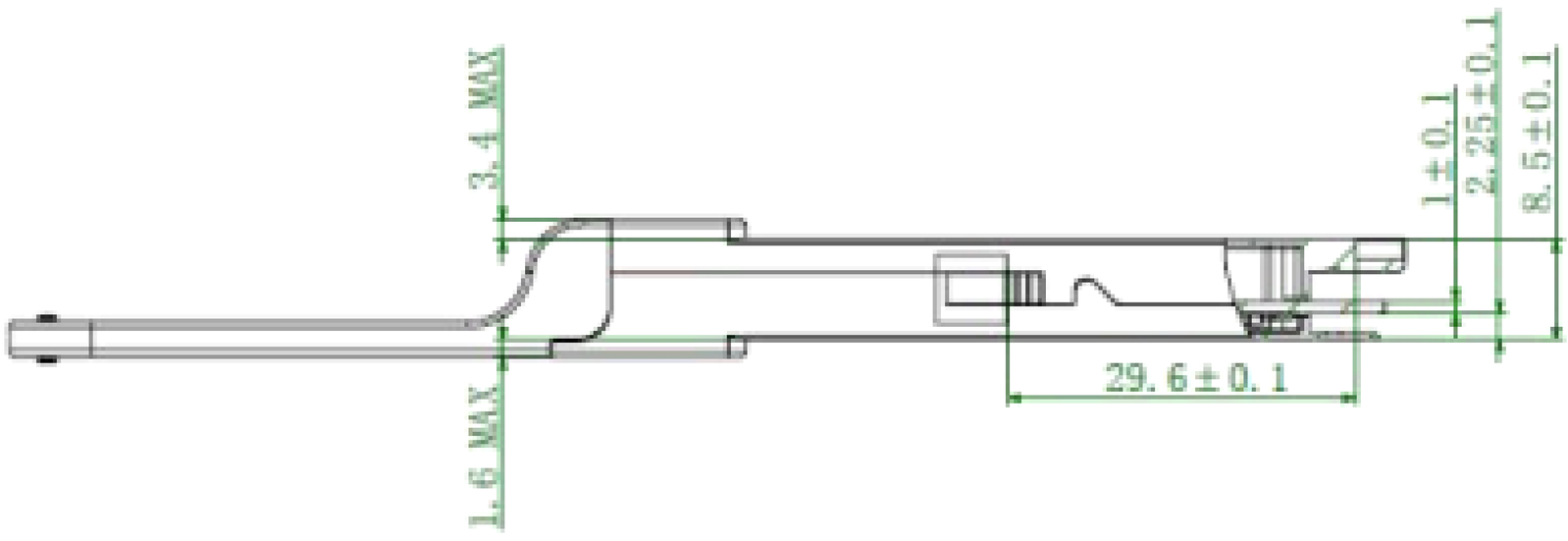
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	3	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	3	
13		GND	Ground	1	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	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	+3.3 V Power Supply transmitter	2	2
30		Vcc1	+3.3 V 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 Output	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Output	3	
38		GND	Ground	1	1

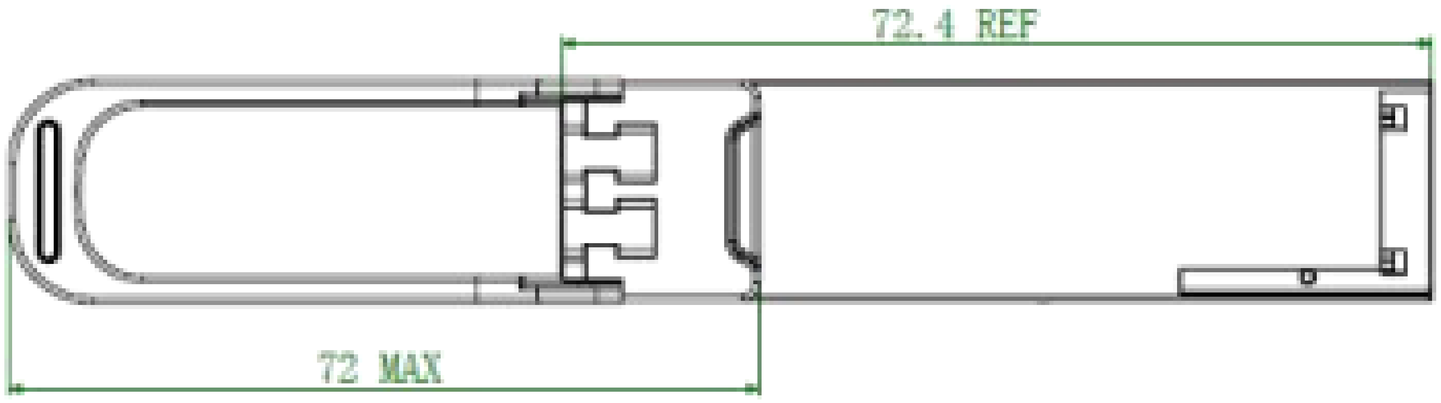
Note 1: GND is the symbol for signal and supply (power) common for the QSFP28 module. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.

Note 2: Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in MSA. The connector pins are each rated for a maximum current of 1000 mA.

Mechanical Dimension







Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.
Laser Safety: The Transceiver uses a semiconductor laser system and is a laser class1 product acc. FDA, complies with 21CFR1040. 10 and 1040.11. Also this product is a laser class 1 product acc. IEC 60825-1