QSFP28-W23-10-100
QSFP28-W32-10-100

100G QSFP28 LR1 BIDI 129/1311nm&1311/1291nm 20km

allmon
Telecomunicações e TI

FEATURES:

- Supports 100GBASE-LR1-20 BIDI;
- Lane signaling rate 106.25Gb/s~111.8Gb/s with PAM4;
- Up to 20km transmission on SMF;
- EML Laser and PIN receiver;
- 4x25.78Gb/s with NRZ electrical interface (CAUI-4);
- High speed I/O electrical interface;
- I2C interface with integrated Digital Diagnostic monitoring;
- QSFP28 MSA package with simplex LC connector;
- Single +3.3V power supply;
- Support HW TX_DIS and RX_LOS for telecom application;

APPLICATIONS:

- 100GBASE-LR1-20 BIDI;

1-ORDER INFORMATION

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI	Latch Color
QSFP28-W23-10-100	106.25Gbps	Tx1291/Rx1311	SMF	20km	LC	0~70C	Y	Purple
QSFP28-W32-10-100	106.25Gbps	Tx1311/Rx1291	SMF	20km	LC	0~70C	Y	Red

2-ABSOLUTE MAXIMUM RATING:

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	Ts	-40	-	+85	°C	
Relative Humidity	Vcc	-0.5	-	+4.0	V	
Operating Relative Humidity	RH	-	-	+85	%	

3-RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Case Temperature	Tc	0	-	+70	°C	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Maximum Power Dissipation	Pd	-	-	4.5	W	
Supply Current	ICC	-	-	1.4	A	
Data Rate(optical)	DRo	-	106.25	111.8	Gb/s	
Transmission Distance	TD		-	20	km	Over SMF

4-Optical Characteristics

Transmitter						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Wavelength	WI	1284.5	1291	1297.5	nm	
		1304.5	1311	1317.5	nm	
Average Launch Power	P_{TX}	-0.2	-	6.6	dBm	1
Optical Modulation Amplitude (OMAouter) TDECQ < 1.4 dB	OMA	1.4+TDECQ	-	6.8	dBm	
Optical Modulation Amplitude (OMAouter) 1.4 dB ≤ TDECQ ≤ TDECQ (max)		2.8	-			
Transmitter and dispersion eye closure for PAM4 (TDECQ) (max)	TDECQ	-	-	3.6	dBm	
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						
Wavelength	WI	1304.5	1311	1317.5	nm	
		1284.5	1291	1297.5	nm	
Average Rx Power	P_{RX}	-10	-	6.6	dBm	1,2
Receive power_OMAouter	P_{OMA}	-	-	6.8	dBm	
Receiver sensitivity_OMAouter, TECQ<1.4dB	Rx_sens	-	-	-7.6	dBm	3
Receiver sensitivity_OMAouter, 1.4≤TECQ≤3.9dB		-	-	-9+TECQ	dBm	

Notes:

- 1. The optical power is launched into SMF.
- 2. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level. The receiver does not have to operate correctly at this input power.
- 3. Measured with conformance test signal at TP3 using the test pattern PRBS31Q or scrambled idle for stressed receiver sensitivity for the BER= 2.4E-4.

5- ELECTRICAL CHARACTERISTICS

High-Speed Signal: *Compliant to CAUI-4 (IEEE 802.3bm)*

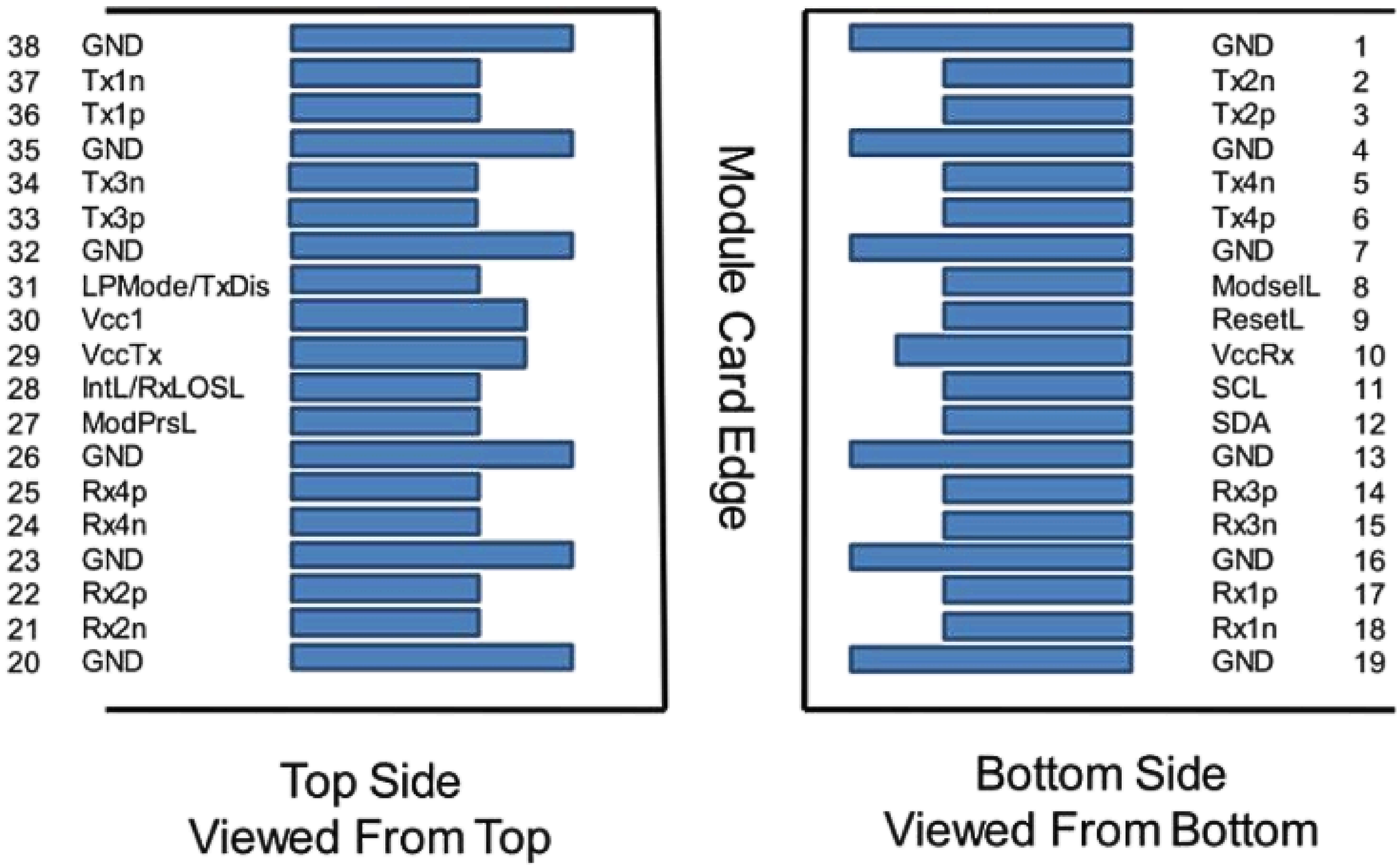
Low-Speed Signal: Compliant to SFF-8679.

Transmitter (Module Input)						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Input Differential Impedance	Rin	-	100	-	Ohm	
Differential Data Input Amplitude	$V_{IN,P-P}$	80	-	900	mVpp	
Differential termination mismatch (max)	D-mismatch	-	-	10	%	
DC common-mode input voltage		-0.3	-	2.8	V	
Transition time(20%~80%)	Tr Tf	10	-	-	ps	
LPMode, Reset and ModSelL / Tx dis	V_{IL}	-0.3	-	0.8	V	
LPMode, Reset and ModSelL / Tx dis	V_{IH}	2.0	-	V_{CC}+0.3	V	
Receiver (Module Output)						
Output Differential Impedance	Rout	-	100	-	Ohm	
Differential Data Output Amplitude	$V_{OUT,P-P}$	-	-	900	mVpp	
Differential termination mismatch (max)	D-mismatch	-	-	10	%	
Transition time, 20% to 80%	Tr Tf	12	-		ps	
ModPrsL and IntL/ Rx los	V_{OL}	0	-	0.4	V	
ModPrsL and IntL/ Rx los	V_{OH}	V_{CC}-0.5	-	V_{CC}+0.3	V	

6-Digital Diagnostics

Parameter	**Range**	**Accuracy**	**Unit**	**Calibration**
Temperature	0 to 70	±3	ºC	Internal
Voltage	0 to V_{CC}	±3%	V	Internal
Tx Bias Current	0 to 120	±10%	mA	Internal
Tx Output Power	1.7 to 7.1	±3	dBm	Internal
Rx Power	-16 to -3.4	±3	dBm	Internal

6-Pin Definitions

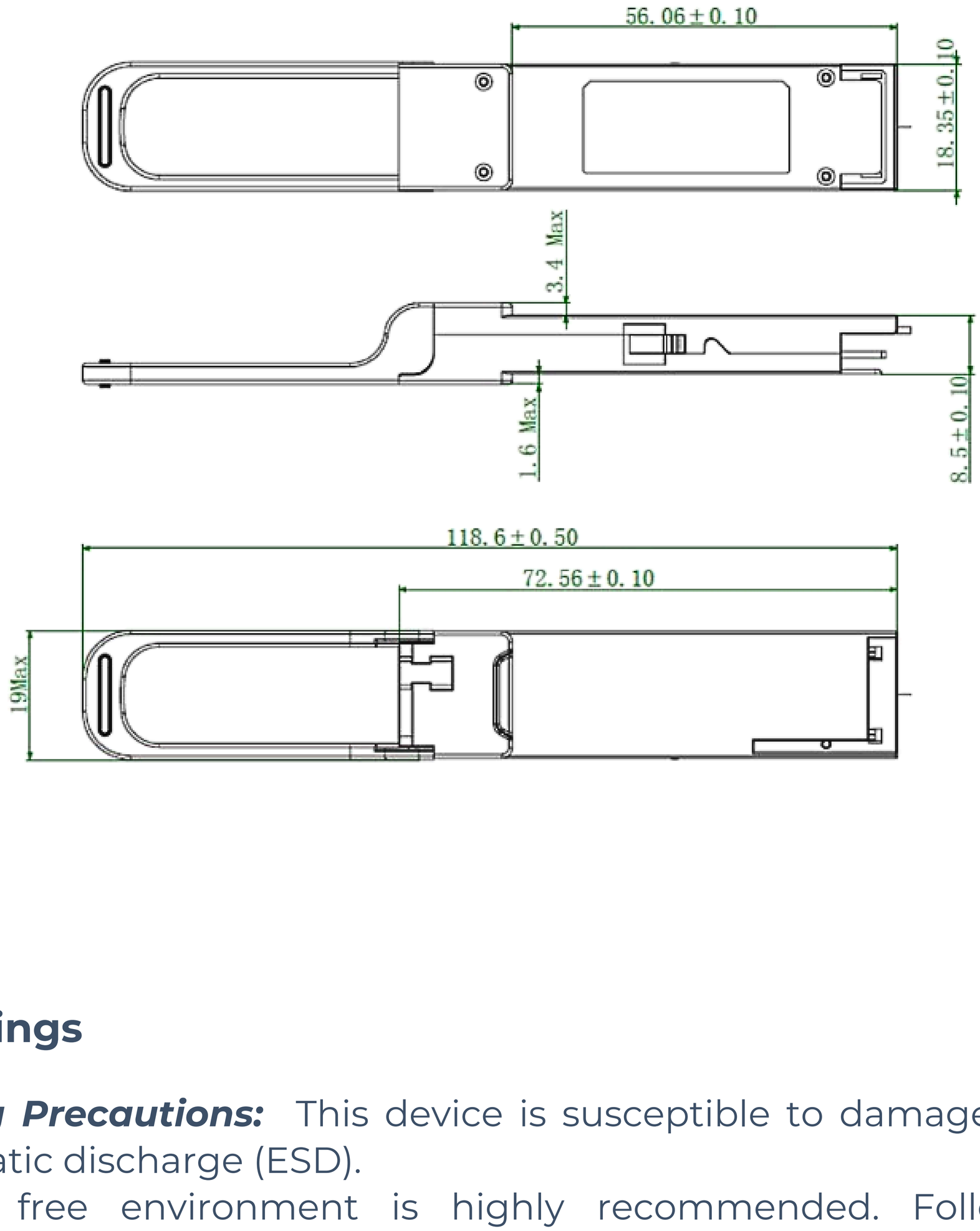


Note 1: GND is the symbol for signal and supply (power) common for the QSFP28 module. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.

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.

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		NC		3	
6		NC		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		NC		3	
15		NC		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		NC		3	
25		NC		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		NC		3	
34		NC		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

8-Mechanical Dimension



9-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: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure
to direct or indirect radiation.