



Datasheet

QSFP28-100G-CWDM4-PO

01

Product features

- Uncooled 4x25Gb/s CWDM transmitter
- QSFP28 MSA compliant
- Supports 103.1Gb/s bit rate
- Compliant with 100G CWDM4 MSA Specification
- Duplex LC connector
- Built-in digital diagnostic functions
- Up to 2km on Single Mode Fiber
- RoHS Compliant
- Operating temperature range: 0°C to 70°C

02

Applications

- Data Center Interconnect
- 100G Ethernet
- Infiniband QDR and DDR interconnects

Description

QSFP28-100G-CWDM4-PO optical transceiver converts 4 input channels of 25Gb/s electrical data to 4 CWDM optical signals, and multiplexes them into a single channel for 100Gb/s optical transmission. Reversely, on the receiver side, the module optically de-multiplexes a 100Gb/s input into 4 CWDM channels signals, and converts them to 4 channels output electrical data.

Absolute Maximum Ratings

The operation in excess of any absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	TS	-40	85	degC	
Operating Case Temperature	TOP	0	70	degC	
Power Supply Voltage	VCC	0.5	3.6	V	
Relative Humidity (non-condensation)	RH	0	85	%	

Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min	Typical	Max	Units	Notes
Operating Case Temperature	TOP	0		70	degC	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Data Rate, each Lane			25.78125		Gbits/s	
Bit error rate	BER			10 ⁻¹²		
Link Distance with G.652	D	0.002		2	km	

Electrical Characteristics

Parameter	Test Point	Min	Typical	Max	Unit	Notes
Power Consumption	P			3.5	W	
Supply Current	Icc			1200	A	

Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Wavelength Assignment	L0	1264.5	1271	1277.5	nm	
	L1	1284.5	1291	1297.5	nm	
	L2	1304.5	1311	1317.5	nm	
	L3	1324.5	1331	1337.5	nm	
Total Average Launch Power	PT			8.5	dBm	
Average Launch Power, each lane	PAVG	-6.5		2.5	dBm	
Optical Modulation Amplitude (OMA)	POMA	-4		+2.5	dBm	
Extinction Ratio	ER	3.5			dB	
Transmitter and Dispersion Penalty per Lane	TDP			3	dBm	
Optical Return Loss Tolerance	TOL			20	dB	

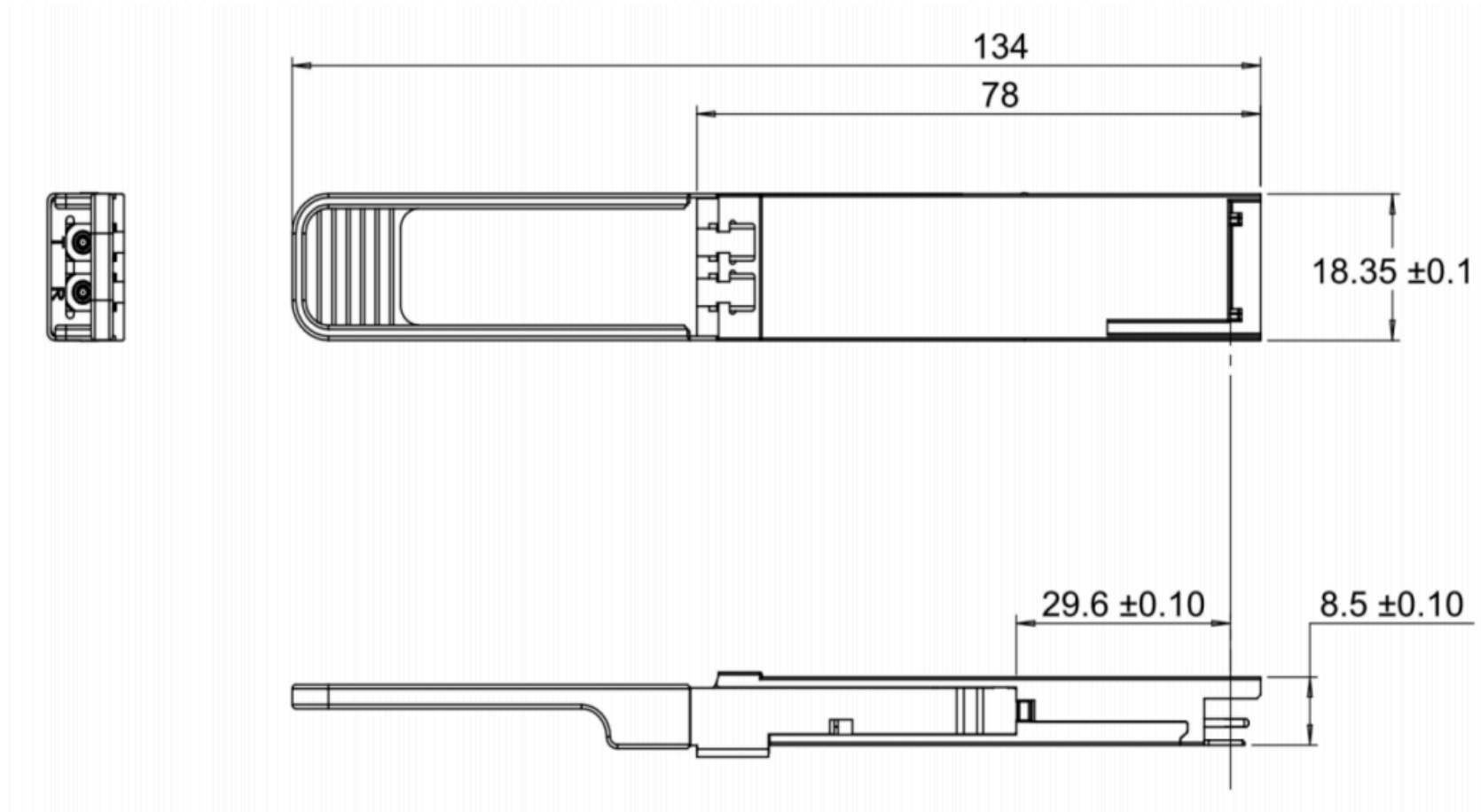
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Average Launch Power OFF Transmitter each Lane	Poff			-30	dBm	
Transmitter Reflectance	RT			-12	dB	
Receiver						
Damage Threshold	THd	3.5			dBm	
Optical Average Input Power(each lane)	Prx	-11.5		2.5	dBm	
Receiver Sensitivity in OMA, each Lane	SEN			-10	dBm	
Signal Loss Assert Threshold	LOSA	-30			dBm	
Signal Loss Deassert Threshold	LOSD			-15	dBm	
LOS Hysteresis	LOSH	0.5	1.5	6	dB	
Optical Modulation Amplitude(each Lane)				2.5	dB	

Digital Diagnostic Functions

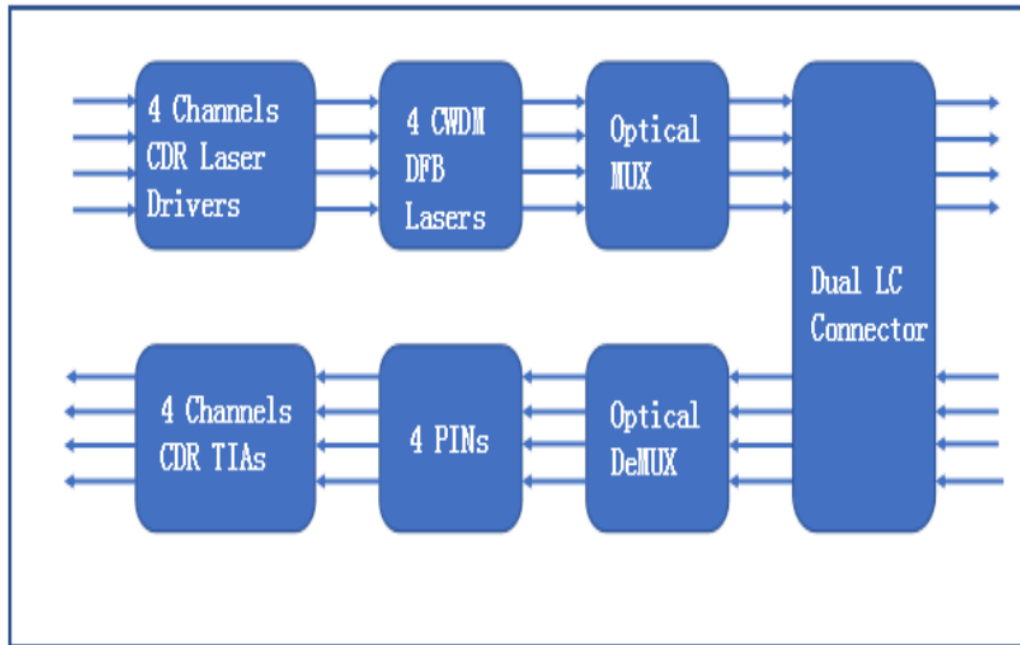
The following digital diagnostic characteristics are defined over the normal operating conditions unless otherwise specified.

Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	3	degC	Over operating temp
Supply voltage monitor absolute error	DMI_VCC	-0.1	0.1	V	Full operating range
Channel RX power monitor absolute error	DMI_RX	-3	3	dB	Per channel
Channel Bias current monitor	DMI_Ibias	-10%	10%	mA	Per channel
Channel TX power monitor absolute error	DMI_TX	-3	3	dB	Per channel

Mechanical Dimension

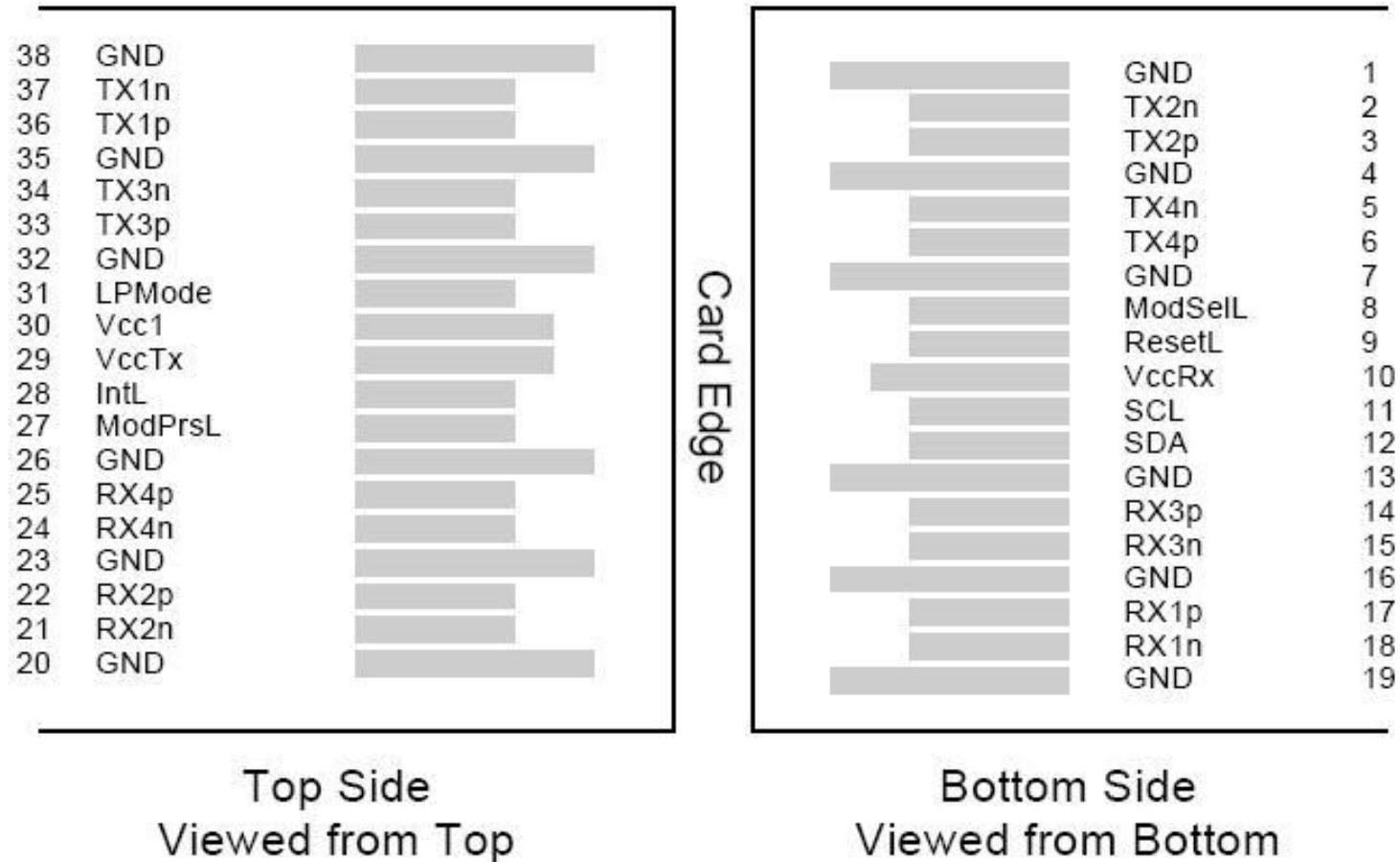


Block Diagram of Transceiver



This product converts the 4-channel 25Gb/s electrical input data into CWDM optical signals (light), by a driven 4-wavelength distributed Feedback Laser array. The light is combined by the MUX parts as a 100Gb/s data, propagating out of the transmitter module from the SMF. The receiver module accepts the 100Gb/s CWDM optical signals input, and de-multiplexes it into 4 individual 25Gb/s channels with different wavelength. Each wavelength light is collected by a discrete photo diode, and then outputted as electric data after amplified by a TIA.

Pin Assignment and Description



PIN Assignment

PIN #	Logic	Symbol	Description
1		GND	Ground
2	CML-I		Transmitter Inverted Data Input
3	CML-I		Transmitter Non-Inverted Data
4		GND	Ground
5	CML-I		Transmitter Inverted Data Input
6	CML-I		Transmitter Non-Inverted Data Output
7		GND	Ground
8	LVTLL-I		Module Select
9	LVTLL-I		Module Reset
10		VccRx	+3.3V Power Supply Receiver
11	LVC MOS-I/O		2-Wire Serial Interface Clock
12	LVC MOS-I/O		2-Wire Serial Interface Data

PIN #	Logic	Symbol	Description
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

PIN #	Logic	Symbol	Description
27	LVTTL-O	ModPrsL	Module Present
28	LVTTL-O	IntL	Interrupt
29		VccTx	+3.3 V Power Supply transmitter
30		VccI	+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 Input
35		GND	Ground
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input
37	CML-I	Tx1n	Transmitter Inverted Data Input
38		GND	Ground



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