QSFP28-100G-LR1 Optical Transceiver

QSFP28 LAN WDM 10km Transceiver, With Diagnostic Monitoring

Features

- ✓ Compliant to 100G Lambda MSA 100G LR1
- ✓ Full-duplex transceiver module
- ✓ 4x25.78125Gbps NRZ electrical interface(CAUI-4)
- ✓ 106.25Gbps PAM4 based on a cooled EML TOSA transmitter
- ✓ 106.25Gbps PAM4 PIN Receiver
- ✓ 4W maximum power dissipation
- ✓ Hot-pluggable QSFP28 form factor
- ✓ Maximum link length of 10km on G.652 SMF with KP-FEC
- ✓ Duplex LC receptacles
- ✓ Built-in digital diagnostic functions
- ✓ Operating case temperature range: 0 to 70℃
- ✓ Single 3.3V power supply
- ✓ RoHS compliant (lead free)

Applications

- ✓ 100G Lambda 100G LR1-10

Description

The hilink 100G LR1 QSFP28 optical transceiver, 100G QSFP28 LR1 is designed for using in 100-Gigabit Ethernet links up to 10km over Single-Mode Fiber (SMF). It is compliant with the QSFP28 MSA , 100G Lambda 100G LR1 and CAUI-4(no FEC)[1]. Digital diagnostics functions are available via the I2C interface, as specified by the QSFP28 MSA.

The module incorporates 1 channel optical signal, on 1311nm center wavelength, operating at 100Gbps data rate. This module can convert 4 channels of 25Gbps (NRZ) electrical input data to 1 channel of 100Gbps (PAM4) optical signal, and also can convert 1 channel of 100Gbps (PAM4) optical signal to 4 channels of 25Gbps (NRZ) electrical output data. The electrical interface uses a 38-contact edge type connector. The optical interface uses a Duplex LC connector. The high performance cooled EML transmitter and high sensitivity PIN receiver provide superior performance for 100Gigabit Ethernet applications up to 10km links.

Note:

1. KR-FEC is optional, please contact us if necessary.

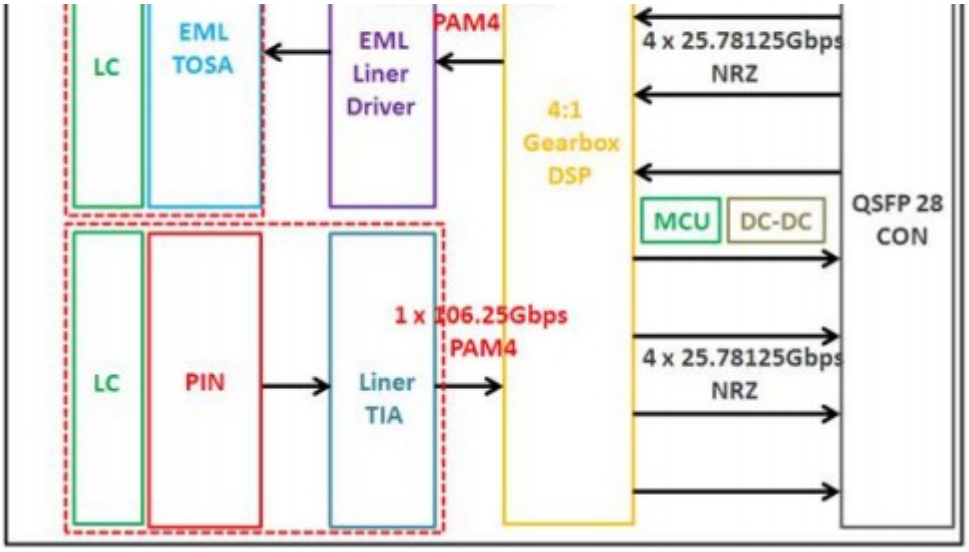


Figure 1. Module Block Diagram

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{cc}	-0.3	3.6	V
Input Voltage	V_{in}	-0.3	Vcc+0.3	V
Storage Temperature	T_s	-20	85	℃
Case Operating Temperature	T_c	0	70	℃
Humidity (non-condensing)	Rh	5	85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	V_{cc}	3.13	3.3	3.47	V
Operating Case temperature	T_c	0	-	70	℃
Data Rate Per Lane	fd	-	106.25	-	Gb/s
Humidity	Rh	5	-	85	%
Power Dissipation	P_m	-	-	4	W
Link Distance with G.652	D	-	-	10	km

Electrical Specifications

Parameter	Symbol	Min	Typical	Max	Unit
Differential Input Impedance	Z_{in}	90	100	110	ohm
Differential Output Impedance	Z_{out}	90	100	110	ohm
Differential Input Voltage Amplitude[1]	ΔV_{in}	-	-	1600	mVp-p
Differential Output Voltage Amplitude[2]	ΔV_{out}	-	-	900	mVp-p

Note:

1. Differential input voltage amplitude is measured between TxnP and TxnN.
2. Differential output voltage amplitude is measured between RxnP and RxnN.

Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Centre Wavelength	λc	1304.5	-	1317.5	nm	-
Side-mode suppression ratio	SMSR	30	-	-	dB	-
Average launch power	Pout	-1.4	-	4.5	dBm	-
Optical Modulation Amplitude(OMA outer)	OMA	0.7	-	4.7	dBm	-
Transmitter and dispersion eye closure(TDECQ)	TDECQ	-	-	3.4	dB	
Extinction Ratio	ER	3.5	-	-	dB	-
Average launch power of OFF transmitter		-	-	-30	dB	-
Receiver						
Centre Wavelength	λc	1304.5	-	1317.5	nm	-
Receiver Sensitivity in OMA outer	RXsen	-	-	-6.1	dBm	1
Average receive power	Pin	-7.7	-	4.5	dBm	-
Receiver Reflectance		-	-	-26	dB	-
LOS Assert		-	-13	-	dBm	-
LOS De-Assert – OMA		-	-11	-	dBm	-
LOS Hysteresis		0.5	-	-	dB	-

Note:

1. Measured with conformance test signal at TP3 for BER = 2.4E-4 Pre-FECs

Pin Description

Pin	Logic	Symbol	Name/Description
1		GND	Module Ground[1]

2	CML-I	Tx2-	Transmitter inverted data input
3	CML-I	Tx2+	Transmitter non-inverted data input
4		GND	Module Ground[1]
5	CML-I	Tx4-	Transmitter inverted data input
6	CML-I	Tx4+	Transmitter non-inverted data input
7		GND	Module Ground[1]
8	LVTTL-I	MODSEIL	Module Select[2]
9	LVTTL-I	ResetL	Module Reset[2]
10		VCCRx	+3.3V Receiver Power Supply
11	LVCMOS-I	SCL	2-wire Serial interface clock[2]
12	LVCMOS-I/O	SDA	2-wire Serial interface data[2]
13		GND	Module Ground[1]
14	CML-O	RX3+	Receiver non-inverted data output
15	CML-O	RX3-	Receiver inverted data output
16		GND	Module Ground[1]
17	CML-O	RX1+	Receiver non-inverted data output
18	CML-O	RX1-	Receiver inverted data output
19		GND	Module Ground[1]
20		GND	Module Ground[1]
21	CML-O	RX2-	Receiver inverted data output
22	CML-O	RX2+	Receiver non-inverted data output
23		GND	Module Ground[1]
24	CML-O	RX4-	Receiver inverted data output
25	CML-O	RX4+	Receiver non-inverted data output
26		GND	Module Ground[1]
27	LVTTL-O	Mod PrsL	Module Present, internal pulled down to GND
28	LVTTL-O	IntL	Interrupt output, should be pulled up on host board[2]
29		VCCTx	+3.3V Transmitter Power Supply
30		VCC1	+3.3V Power Supply
31	LVTTL-I	LPMode	Low Power Mode[2]
32		GND	Module Ground[1]
33	CML-I	Tx3+	Transmitter non-inverted data input
34	CML-I	Tx3-	Transmitter inverted data input
35		GND	Module Ground[1]
36	CML-I	Tx1+	Transmitter non-inverted data input
37	CML-I	Tx1-	Transmitter inverted data input
38		GND	Module Ground[1]

Note:

1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector should be pulled up with 4.7K to 10K ohms on host board to a voltage between 3. 15V and 3.6V.

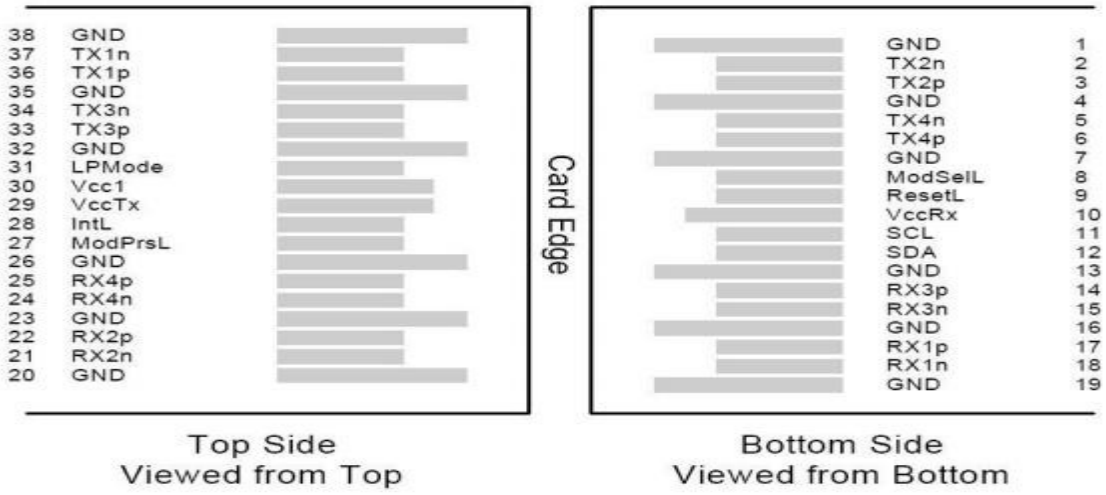
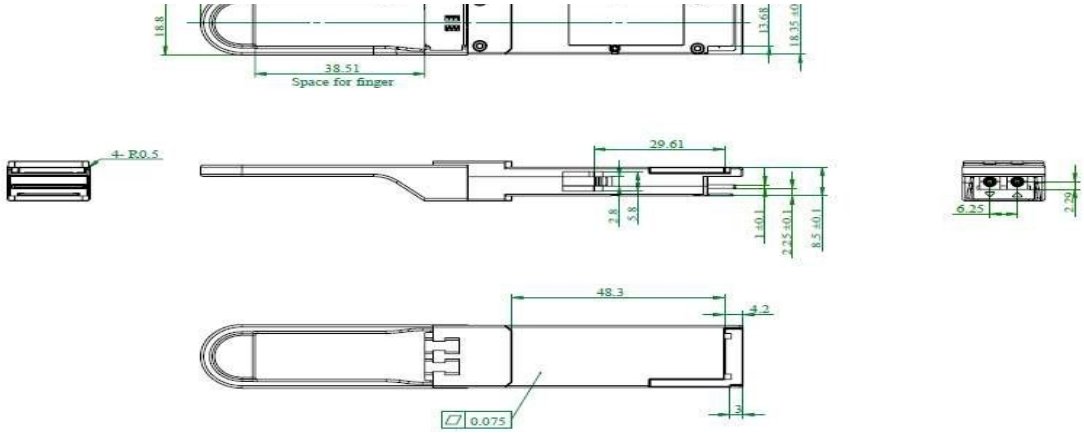


Figure 2. Electrical Pin-out Details

Mechanical Dimensions



Ordering Information

Part Number	Product Description
QSFP28-100G-LR1	QSFP28 LR1 106.25Gb/s, 10km, EML+PIN, SMF, Dual LC