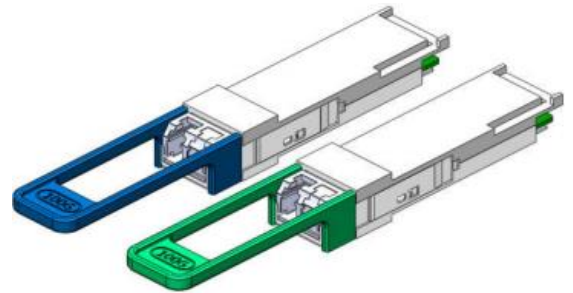


Features

- Supports 100GBASE-ER BIDI
- Lane signaling rate 100Gbps
- Single 3.3V Power Supply
- Up to 40km over SMF with FEC
- SFF-8636 Rev 2.10a Compliant
- 4x25G electrical interface
- QSFP28 MSA package with simplex LC connector
- Maximum power consumption 4.5 W
- Operating case temperature: 0 to +70 °C
- I2 C interface with integrated Digital Diagnostic
- Monitoring



Application

- 100G Ethernet
- Data center

Ordering Information

Part No.	Data Rate	Wavelength (Tx)	Fiber	Distance	Interface	Temp.	DDMI
DC-34100G-40A	100Gbps	1304nm	SMF	40km	LC	0~+70°C	Yes
DC-39100G-40B	100Gbps	1309nm	SMF	40km	LC	0~+70°C	Yes

Product Description

The QSFP28 BIDI transceiver module is designed for use in 100 Gigabit Ethernet links over 40km single mode fiber. The module incorporates one channel optical signal, operating at 50Gbaud data rate. The electrical interface of the module is compliant with the OIF CEI-28G-VSR and compliant with QSFP28 MSA.



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage temperature	Ts	-40	+85	°C
Operating case temperature	Top	-5	75	°C
Supply voltage	Vcc	-0.5	3.6	V
Damage threshold	Rxdmg	-2.4		dBm

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating case temperature	Tc	0		70	°C
Power supply voltage	Vcc	3.135	3.3	3.465	V
Operating relative humidity	RH	5		85	%
Power dissipation	PD			4.5	W

* Power Supply specifications, Instantaneous, sustained and steady state current are compliant with QSFP28 MSA Power Classification.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Differential data input swing per lane		900			mV _{p-p}	
Differential input impedance	Zin	90	100	110	ohm	
DC common mode voltage (Vcm)		-350		2850	mV	
Receiver						
Differential output amplitude				900	mV _{p-p}	
Differential output impedance	Zout	90	100	110	ohm	
Output Rise/Fall Time	tr/tf	12			ps	20%~80%
Eye width		0.57			UI	
Eye height differential		228			mV	@TP4, 1E-15
DC common mode voltage (Vcm)		-350		2850	mV	1

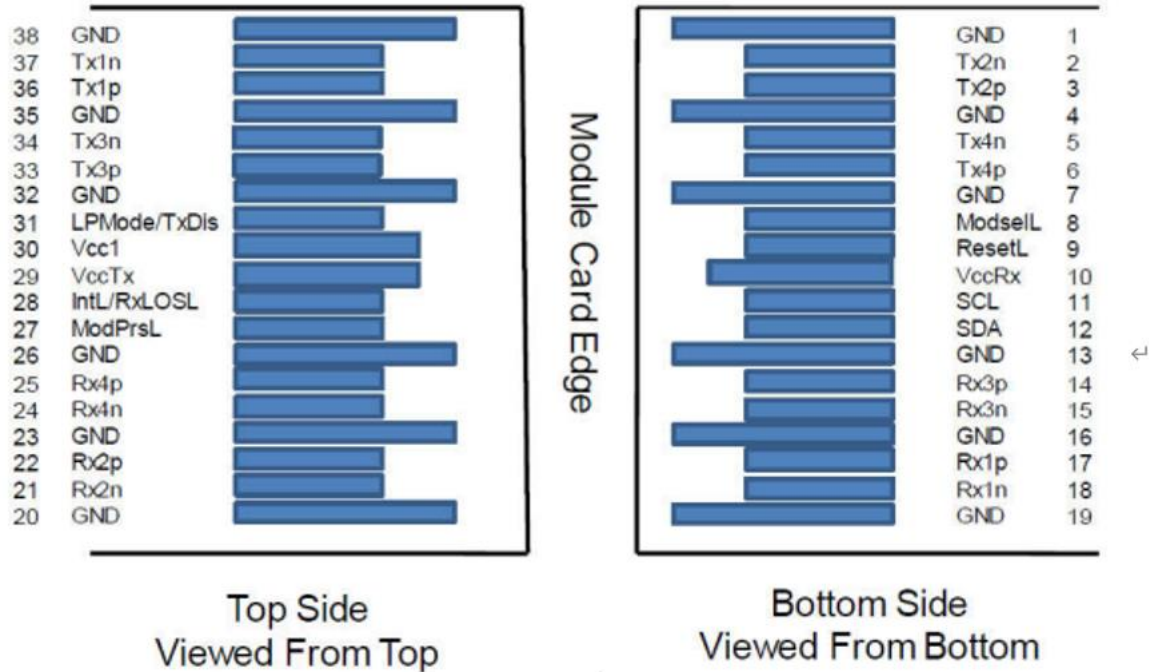
Notes:

1. Vcm is generated by the host. Specification includes effects of ground offset voltage.

Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Signaling speed			53.125		Gbaud
Modulation format		PAM4			
Center wavelength	λ_C	1304.06	1304.58	1305.1	nm
		1308.61	1309.14	1309.66	
Side-mode suppression ratio	SMSR	30			dB
Extinction ratio	ER	6			dB
Transmit OMA For TDECQ<1.4 For TDECQ>1.4	TxOMA	4.5 3.1+TDECQ		7.9	dBm
Transmit average power	TxAVG	1.5		7.1	dBm
Transmitter and dispersion eye closure TDECQ-TECQ	TDECQ			3.9	dB
Launch power of OFF Transmitter per lane				-30	dBm
Transmitter over/under-shoot				22	%
Transmitter peak-to-peak power				8.4	dBm
Relative Intensity Noise	RIN			-136	dB/Hz
Optical return loss tolerance				15	dB
Transmitter reflectance				-26	dB
Transmitter transition time				17	ps
Receiver					
Signaling speed			53.125		Gbaud
Center wavelength	λ_C	1308.61	1309.14	1309.66	nm
		1304.06	1304.58	1305.1	
Damage threshold		-2.4			dBm
Receive power (OMA _{outer})	RxOMA			-2.6	dBm
Average receive power	RxAVG	-16.2		-3.4	dBm
Receiver sensitivity (OMA _{outer}) (EOL)	SenOMA			-14	dBm @BER2.4E-4
Stressed Sensitivity	SRS			-11.5	dBm
Receiver reflectance				-26	dB
LOS assert	LOSA	-26		-20	dBm
LOS De-assert	LOSD			-17	dBm

QSFP28 Transceiver Electrical Pad Layout



Pin Arrangement and Definition

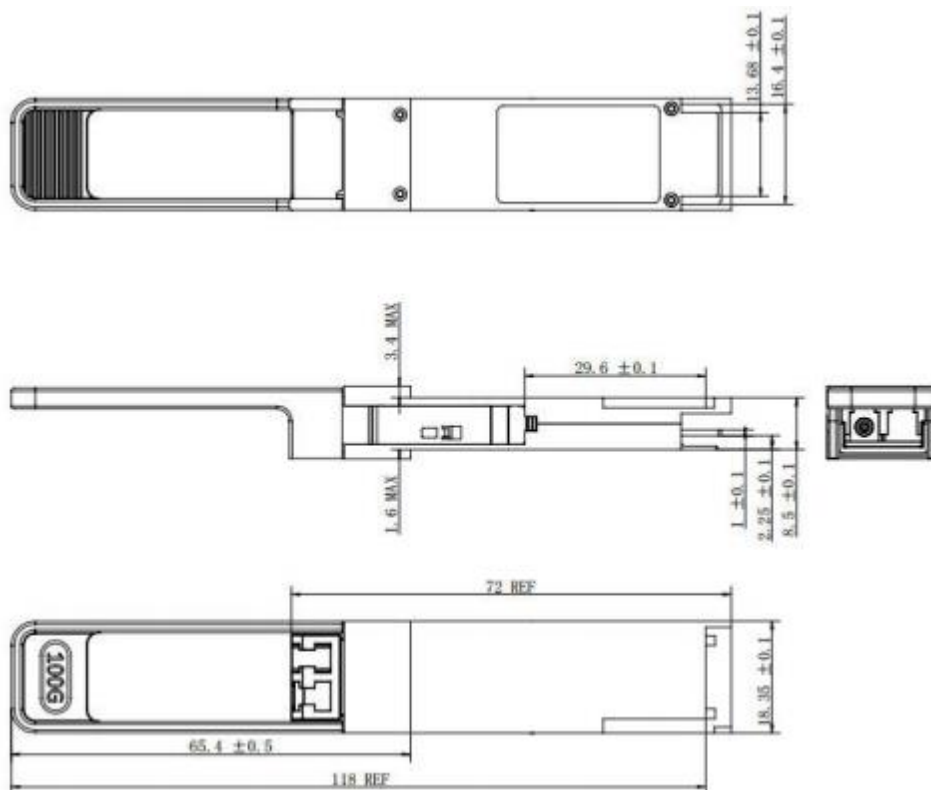
Pin	Logic	Symbol	Description	Notes
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	
7		GND	Ground	1
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2
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	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1

21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL/ RxLOSL	Interrupt. Optionally Configurable As RxLOSL Via The Management Interface (SFF-8636).	
29		VccTx	+3.3V Power supply transmitter	2
30		Vcc1	+3.3V Power supply	2
31	LVTTL-I	LPMode/TxDis	Low Power Mode. Optionally Configurable As TxDis Via The Management Interface (SFF-8636).	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Input	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Input	
38		GND	Ground	1

1: GND is the symbol for signal and supply (power) common for QSFP28 modules. 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.

2: VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. VccRx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 1000mA.

Mechanical Specifications





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.