

VC-QSFP28-100G-ER1-30

Features

- ✓ Supports 100GBASE-ER1-30;
- ✓ Lane bit rate 103.125Gb/s~106.25 Gb/s with PAM4;
- ✓ Up to 30km transmission on SMF;
- ✓ 1310nm laser and APD 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 4.5W;
- ✓ Operating case temperature: 0 to +70 °C;
- ✓ Compliant to SFF-8636&SFF-8679 standard;
- ✓ Complies with EU Directive 2015/863/EU;

Application

- ✓ 100GBASE-ER1-30;
- ✓ Data center / Cloud application;
- ✓ Other application.

Absolute Maximum Ratings

Table 1-Absolute Maximum Ratings

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 Conditions

Table 2-Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	TC	0	-	+70	°C	
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Power Supply Current	ICC	-	-	1.3	A	
Maximum Power Dissipation	PD	-	-	4.5	W	
Lane Bit Rate	BRLA NE	-	103.125	106.25	Gb/s	With PAM4
Transmission Distance	TD	-	-	30	km	Over SMF

Transmitter						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength	λ	1308.09	-	1310.19	nm	
Average Launch Power ^a	PTX_LANE	0	-	5.6	dBm	SMF
Outer optical modulation amplitude (OMA _{outer})	OMA _{outer}	3	-	6.4	dBm	TDECQ < 1.4 dB
		1.6+TDECQ	-		dBm	1.4 dB < TDECQ < TDECQ (max)
Transmitter and dispersion eye closure for PAM4 (TDECQ)	TDECQ	-	-	3.9	dB	
TECQ(Max)		-	-	3.9	dB	
TDECQ-TECQ (max)		-	-	2.7	dB	
Average Output Power (Laser Turn off)	POUT-OFF	-	-	-15	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	5	-	-	dB	
Transmitter reflectance (max)	Trf	-	-	-26	dB	
Receiver						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength	λ	1308.09	-	1310.19	nm	
Damage threshold ^c	P _{damage}	-2.4	-	-		
Average Rx Power ^d	PRX_LANE	-14.7	-	-3.4	dBm	
Receiver power (OMA _{outer})	POMA_LANE	-	-	-2.6	dBm	
Receiver sensitivity (OMA _{outer})	SENOMA	-	-	-12.5	dBm	TECQ < 1.4 dB
		-	-	-13.9+TECQ	dBm	1.4 < TECQ < 3.9 dB

Optical Characteristics

Table 3-Optical Characteristics

Notes:

- 1.Average launch power, (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
- 2.Transmitter reflectance is defined looking into the transmitter
- 3.The receiver shall be able to tolerate, without damage, continuous exposure to an optical signal having this average power level. The receiver does not have to operate correctly at this input power.
- 4.Average receive power, (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.
- 5.Receiver sensitivity (OMA outer) (max) is defined for a transmitter with a value of TECQ up to 3.6 dB for 100G-LR1 20 and 3.9 dB for 100G-ER1-30 and 100G-ER1-40.

Electrical Characteristics

Table 4-Electrical Characteristics

Transmitter (Module Input)						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Differential Data Input Amplitude	VIN,P-P	85	-	900	mVp	
Differential Termination Mismatch		-	-	10	%	
LPMode, Reset and ModSelL, V in low	VIL	-0.3	-	0.8	V	
LPMode, Reset and ModSelL, V in high	VIH	2.0	-	VCC+0.3	V	
Receiver (Module Output)						
Differential Data Output Amplitude	VOU T,P-P	200	-	900	mVp	
Differential Termination Mismatch		-	-	10	%	
Transition time, 20% to 80%	Tr Tf	12			ps	

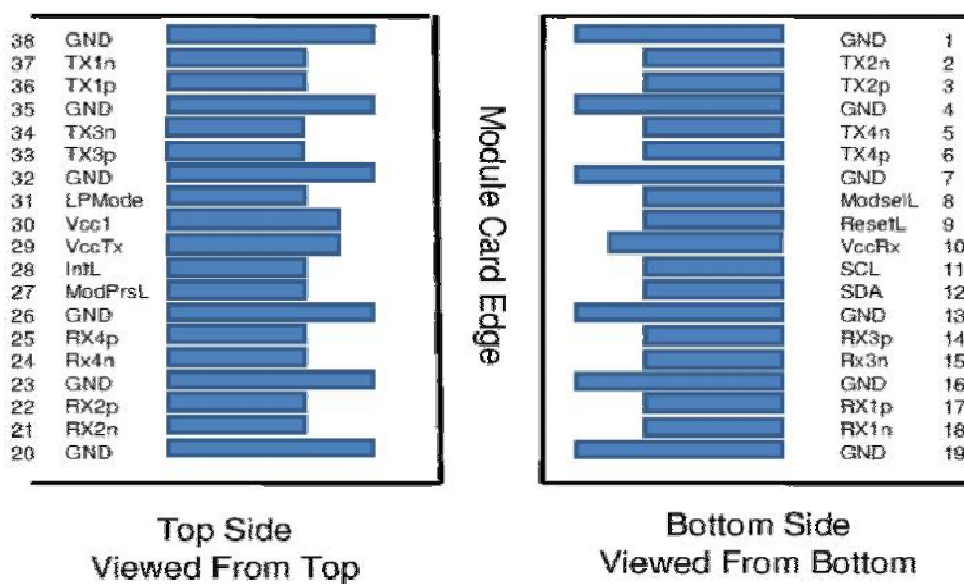
ModPrsL and IntL, V out low	VOL	0	-	0.4	V	
ModPrsL and IntL, V out high	VOH	VCC-0.5	-	VCC+0.3	V	

Digital Diagnostics

Table 5-Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	°C	Internal
Voltage	0 to VCC	±3%	V	Internal
Tx Bias Current	0 to 100	±10%	mA	Internal
Tx Output Power	0 to 5.6	±3	dB	Internal
Rx Input Power	-14.7 to -3.4	±3	dB	Internal

Pin Definitions

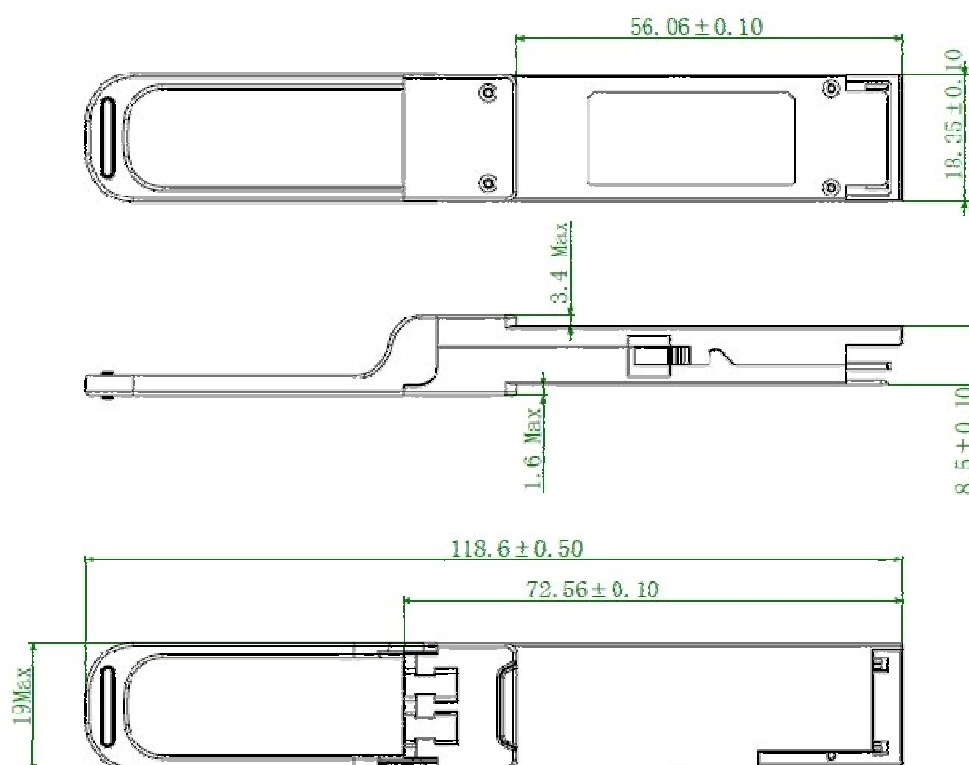


PI N	Logic	Symbol	Description	Plug Seq.	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	3	

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	ModSel L	Module Select	3	
9	LVTLL-I	ResetL	Module Reset	3	
10		VccRx	+ 3.3V Power Supply Receiver	2	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	3	
12	LVC MOS-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	ModPrs L	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, Vcc I 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



Order Information

Part Number.	Description
VC-QSFP28-100G-ER1-30	100Gbps, 1310nm, SMF, 30km, 0~70C, with DDM