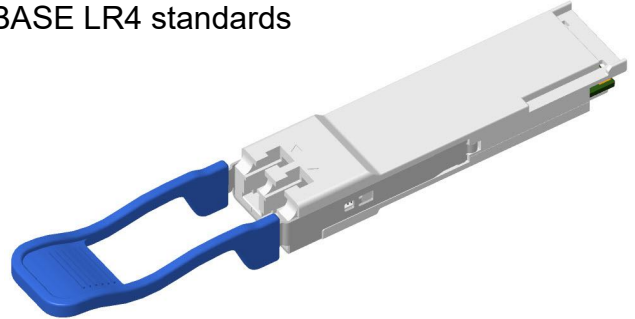


TS-QP-3140-20DC

40G QSFP+ 20km LR4 Transceivers

FEATURES

- Compliant with 40G Ethernet IEEE 802.3ba 40GBASE LR4 standards
- Uncooled 4x10Gb/s CWDM transmitter
- Supports Infiniband SDR, DDR and QDR
- Wide Operating Temperature(0°C~70°C)



APPLICATIONS

- Data Center Backbone
- Ethernet Switches
- High-speed Servers
- High-performance Computing Clusters
- SAN, Routers, Hubs, Load Balancer

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Min.	Max.	Unit
Storage Temperature	T _{Storage}		-40	+85	°C
Relative Humidity	RH		0	+85	%

RECOMMENDED OPERATING CONDITIONS (T=25°C, unless noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Case Temperature	T _c		0	40	70	°C
Power Supply Voltage	V _{CC}		3.135	3.3	3.465	V
Signaling Rate each Channel				10.3125		Gbps
Two Wire Serial (TWS) Interface Clock Rate			---	---	400	kHz
Power Supply Noise			---	---	50	mVpp
Supply Noise Rejection			---	---	100	mV
Receiver Differential Data Output			---	100		Ohm
Operating Distance	D		---	20	---	km

ELECTRICAL CHARACTERISTICS (T=25°C, unless noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Power Consumption					3.5	W
Supply Current	I _{cc}				1050	mA

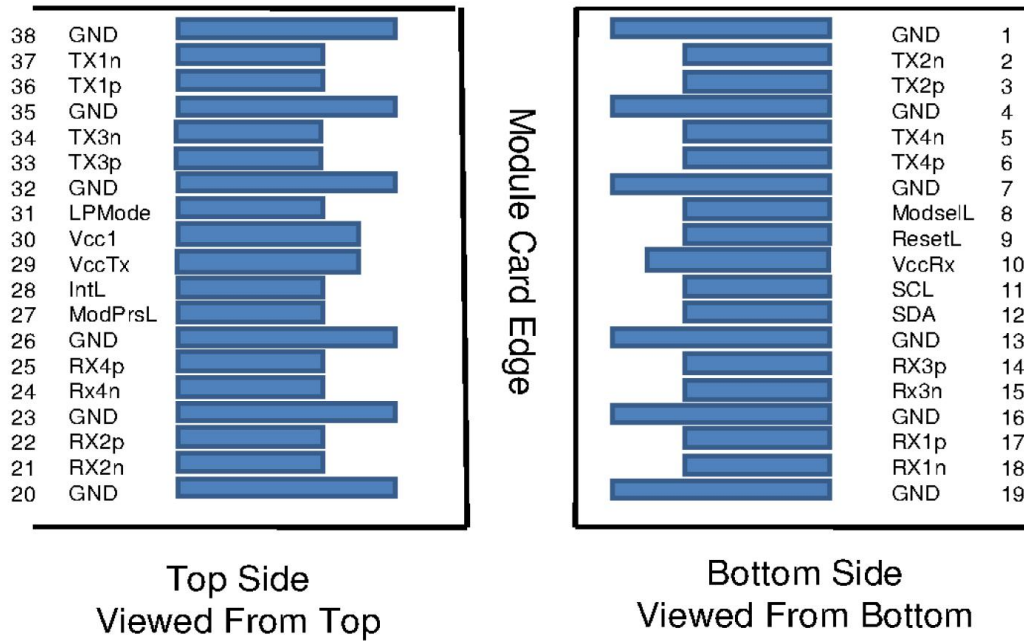
TRANSMITTER CHARACTERISTICS (T=25°C, unless noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Signaling rate, each lane (range)	GBb			10.3125		GBb
Center Wavelength	λ_0		1264.5		1277.5	nm
	λ_1		1284.5		1297.5	nm
	λ_2		1304.5		1317.5	nm
	λ_3		1324.5		1337.5	nm
Side-mode suppression ratio	SMSR		30			dB
Total average launch power					8.3	dBm
Average launch power, each lane	Pf		-5		2.3	dBm
Optical Modulation Amplitude (OMA), each lane	TxOMA		-4		3.5	dBm
Difference in launch power between any two lanes (OMA)					6.5	dB
Transmitter and Dispersion Penalty	TDP				2.6	dB
Launch power in OMA minus TDP, each lane	Tx-TDP		-4.8			dBm
Average launch power of OFF transmitter, each lane					-30	dBm
Extinction ratio	ER		3.5			dB
Relative Intensity Noise					-128	dB/Hz
Optical return loss tolerance					20	dB
Transmitter reflectance					-12	dB

RECEIVER CHARACTERISTICS (T=25°C, unless noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Signaling rate, each lane (range)	GBb			10.3125		GBb
Center Wavelength	λ_0		1264.5		1277.5	nm
	λ_1		1284.5		1297.5	nm
	λ_2		1304.5		1317.5	nm
	λ_3		1324.5		1337.5	nm
Damage threshold			3.3			dBm
Average power at receiver input, each lane			-13.7		2.3	dBm
Receive power, each lane (OMA)					3.5	dBm
Difference in receive power between any two lanes (OMA)					7.5	dBm
Receiver reflectance					-26	dB
Receiver sensitivity (OMA)	S _{OMA}	BER@10e-12			-11.5	dBm
LOS Assert	LOS _A		-28			dBm
LOS De-Assert	LOS _D				-12	dBm
LOS Hysteresis			0.5		6	dB

PIN ASSIGNMENT

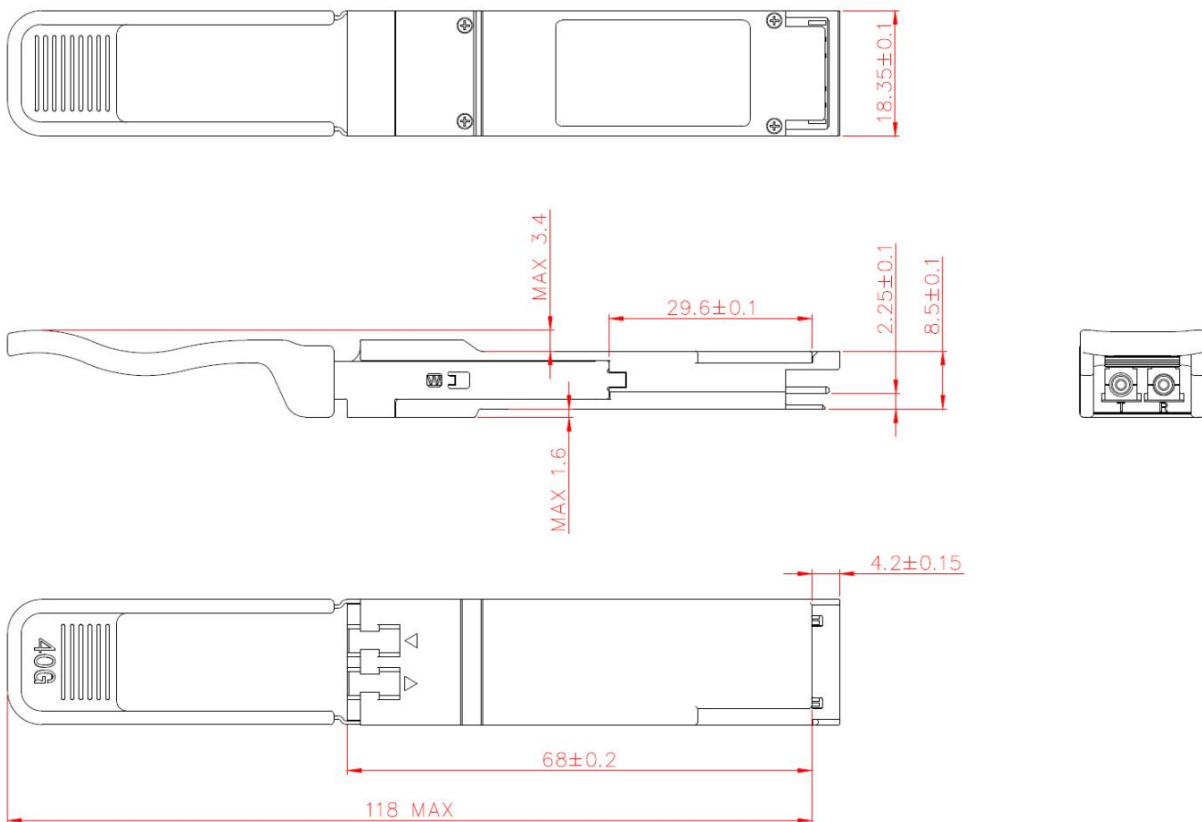


PIN DESCRIPTION

PIN	Logic	Symbol	Name/Description	Note
1		GND	Ground	
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		VccRx	+ 3.3V Power Supply Receiver	
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	
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	
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	
30		Vcc1	+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 Output	
35		GND	Ground	
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	

OUTLINE DIMENSIONS



Digital Diagnostic Monitor Accuracy

The following characteristics are defined over recommended operating conditions

Parameter	Accuracy	Unit
Internally measured transceiver temperature	+/-3	deg.C
Internally measured transceiver supply voltage	+/-3	%
Measured Tx bias current	+/-10	%
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB