

Features:

- Hot pluggable QSFP28 MSA form factor
- Supports 103.1Gb/s aggregate bit rate
- Up to 20km reach for G.652 SMF [with RS(528,514) FEC]
- Single +3.3V power supply
- Extended case temperature range of -20 to 85°C
- Cooled 4x25Gb/s LAN WDM TOSA, LAN WDM ROSA
- Maximum power consumption 5W
- Single LC receptacle
- Compliant with the QSFP28 and 4WDM-20 MSA
- Compatible with RoHS2.0
- DDM function



Applications:

- Ethernet Links
- 100G 4WDM-20 applications with FEC

1. Absolute Maximum Ratings

Exceeding the limits below may damage the transceiver module permanently

Parameter	Symbol	Unit	Min	Max
Temperature Range	Ts	°C	-40	+85
Relative Humidity	RH	%	5	95
Power Supply Voltage	Vcc	V	-0.3	+3.6
Case Temperature Range when module is powered on Ready State	Tc	°C	-20	85
Receiver Damage Threshold Per Lane	Pdag	dBm		+6.0
ESD (HBM)		V		1000

2. Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Operating Case Temperature Range	Tc	°C	-20		85
Relative Humidity	RH	%	0		90
Power Supply Voltage	Vcc	V	3.135	3.3	3.465
Total Power Consumption	Pw	W			5
Data rate (each line)		Gb/s		25.78125	-

3. Voltage Supply Electrical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Notes
Steady State Supply Current	Icc	mA	-	-	1443.0	
Sustained peak current	ISP	mA			1650	
Instantaneous peak current	IIP				2000	
Power Dissipation	Pw	W			5	
Low Power Dissipation	Plow	W			1.5	

4. Different Signal Electrical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Notes
Pattern				PRBS9		
Transmitter Electrical Input from Host at TP1a (detailed specification in CEI-28G-VSR)						
Differential voltage pk-pk		mV		-	900	
Common mode noise (rms)		mV			17.5	
Eye height		mV	95			
Eye width		Ui	0.46			
Differential termination mismatch		%			10	
Transition time		ps	10			20/80%
Common mode voltage		V	-0.3		2.8	
Receiver Electrical Output to Host at TP4 (detailed specification in CEI-28G-VSR)						
Differential voltage pk-pk		mV		-	900	
Common mode noise (rms)		mV			17.5	
Eye height		mV	228			
Eye width		Ui	0.57			
Differential termination mismatch		%			10	

Transition time		ps	9.5			20/80%
Vertical eye closure	VEC	dB			5.5	

5. LVTTTL Electrical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max
Input High Voltage	VIH	V	2.0	-	Vcc+0.3
Input Low Voltage	VIL	V	-0.3	-	0.8
Input Leakage Current	IIN	uA	-10	-	+10
Output High Voltage (IOH=100uA)	VOH	V	Vcc-0.5	-	Vcc+0.3
Output Low Voltage (IOL=100uA)	VOL	V	0		0.4

6. LVCMOS Electrical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max
Input High Voltage	VIH	V	Vcc*0.7	-	Vcc+0.5
Input Low Voltage	VIL	V	-0.3	-	Vcc*0.3
Output High Voltage (IOH=100uA)	VOH	V	Vcc-0.5	-	Vcc+0.3
Output Low Voltage (IOL=100uA)	VOL	V	0		0.4
I/O Pin Capacitance	Ci	pF			14

7. Optical Specifications

Parameter	Symbol	Unit	Min	Typ	Max
Optical Transmitter Characteristics					
Signaling Rate, Each Lane		Gbps	-	25.78125	
Signaling Speed Accuracy	ppm	-100		+100	
Blue Side Four Lane Wavelength Range	$\lambda 1$	nm	1272.55	1273.55	1274.54
	$\lambda 2$		1276.89	1277.89	1278.89
	$\lambda 3$		1281.25	1282.26	1283.27
	$\lambda 4$		1285.65	1286.66	1287.68
Red Side Four Lane Wavelength Range	$\lambda 5$	nm	1294.53	1295.56	1296.59
	$\lambda 6$		1299.02	1300.05	1301.09
	$\lambda 7$		1303.54	1304.58	1305.63
	$\lambda 8$		1308.09	1309.14	1310.19
Side Mode Suppression Ratio (min)	SMSR		30		
Total Average Launch Power	Pt	dBm	-		10.5

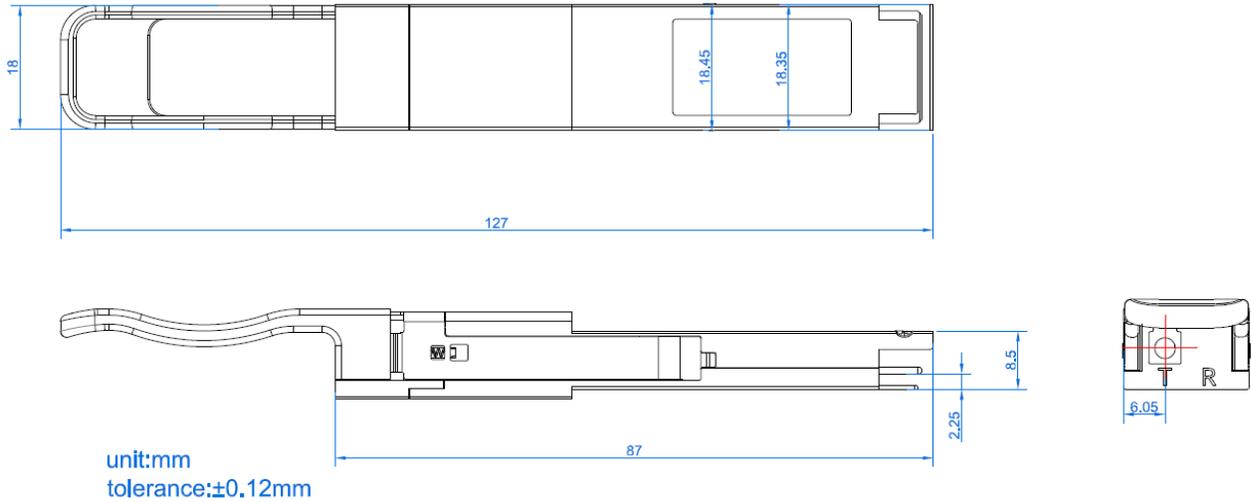
Average Launch Power, Each lane	Pa	dBm	-4.3 ¹		+4.5
Optical Modulation Amplitude	OMA	dBm	-1.3 ²		4.5
Launch power in OMA minus TDP		dB	-2.3		
Difference in launch power between any two lanes (OMA) (max)		dB			5.0
Transmitter and Dispersion Penalty for Each Lane	TDP	dB			2.8 ⁴
Average Launch Power of Off Transmitter for Each Lanes	Poff	dBm	-		-30
Extinction Ratio	EX	dB	4		
Optical Return Loss Tolerance	dB				20
Transmitter Reflectance	dB				-26 ³
Eye Diagram			{0.25, 0.4, 0.45, 0.25, 0.28, 0.4} ⁵		
Eye mask margin			≥10%		
Optical Path & Power budget					
Power budget (for max TDP)	dB				13
Operating distance	km	20			
Channel insertion loss	dB	0	10.2		
Maximum discrete reflectance	dB				-26
Allocation for penalties (for max TDP)	dB				2.8
Dispersion @Blue side Neg	ps/nm	-10 ²			-70
Dispersion @Blue side Pos	ps/nm	-53			-23
Dispersion @Red side Neg	ps/nm	-53			-26
Dispersion @Red side Pos	ps/nm	-10			19
Optical Receiver Characteristics					
Receive Rate for Each Lane	Gbps	-	25.78125		
Signaling Speed Accuracy		ppm	-100		+100
Red Side Four Lane Wavelength Range	λ5	nm	1294.53	1295.56	1296.59
	λ6		1299.02	1300.05	1301.09
	λ7		1303.54	1304.58	1305.63
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Blue Side Four Lane Wavelength Range	λ1	nm	1272.55	1273.55	1274.54
	λ2		1276.89	1277.89	1278.89
	λ3		1281.25	1282.26	1283.27
	λ4		1285.65	1286.66	1287.68

Overload Input Optical Power ⁶	Pmax	dBm	5.5		
Average Receive Power for Each	Pin		-14.5 ⁷		4.5
Receive Power In OMA for Each	PinOMA	dBm	-		4.5
Receiver reflectance		dB	-26		
Receiver Sensitivity in OMA for Each Lane (100GbE) at BER= 5x10 ⁻⁵ BER ⁸	SOMA		dBm		-12.5
Stressed Receiver Sensitivity in OMA for Each Lane ⁹		dBm			-10.0
RX Los Assert level		The assert level occurs for the RX input power to a lane corresponding to an equivalent BER of 1E 2 to 1E 4			
Los Hysteresis		dBm	0.5		

Notes:

1. Average launch power, each lane (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. Even if the TDP < 1dB, the OMA (min) must exceed this value
3. Transmitter reflectance is defined looking into the transmitter
4. TDP does not include a penalty for multi path interference (MPI).
5. Eye mask hit ratio is 5E-5
6. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level
7. Average receive power, each lane (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.
8. Receiver sensitivity (OMA), each lane (max) at 5 x 10⁻⁵ BER is a normative specification.
9. Measured with conformance test signal at TP3 (Refer to IEEE Std 802.3™ 802.3™ --2015 Cl. 88.8.10) for BER = 5x10⁻⁵

8. Mechanical Drawings



Note: External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.

9. Ordering Information

OEM	Part Number	OEM	Part Number
Cisco	QSFP-100G-BXB-S-20K-xx	MSA Champion ONE	100GQSFP28EGBL20
Extreme	10403-BXB-20K		

10. Contact Information

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