

# SNR-QSFP28-CLR4-2

QSFP28, 100G BASE Series

## SNR-QSFP28-CLR4-2

Single-Mode 100GBASE CWDM4/CLR4 2Km  
QSFP28 Transceiver  
RoHS6 Compliant

### Features

- ◆ Supports 103Gbps
- ◆ Single 3.3V Power Supply
- ◆ Power dissipation < 3.5W
- ◆ Up to 2km over SMF
- ◆ RoHS-6 compliant (lead-free)
- ◆ 4x25G electrical interface
- ◆ Duplex LC receptacles
- ◆ Commercial case temperature range of 0°C to 70°C
- ◆ Four 25Gbps DFB base CWDM channels on transmitter side
- ◆ PIN and TIA array on the receiver side
- ◆ I2C interface with integrated Digital Diagnostic Monitoring



### Applications

- ◆ 100G Ethernet
- ◆ Data center

### Ordering Information

Part No.	Data Rate	Fiber	Distance *(note2)	Interface	Temp.	DDMI
SNR-QSFP28-CLR4-2*(note1)	103Gbps	SMF	2km	LC	0~+70°C	Yes

Note1: Standard version

Note2: Over SMF

\*The product image only for reference purpose

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## Regulatory Compliance\*

Product Certificate	Certificate Number	Applicable Standard
TUV	R50135086	EN 60950-1:2006+A11+A1+A12+A2
		EN 60825-1:2014
		EN 60825-2:2004+A1+A2
UL	E317337	UL 60950-1
		CSA C22.2 No. 60950-1-07
EMC CE	AE 50285865 0001	EN 55022:2010
		EN 55024:2010
FCC	WTF14F0514417E	47 CFR PART 15 OCT., 2013
FDA	/	CDRH 1040.10
ROHS	/	2011/65/EU

\*The above certificate number updated to June 2014, because some certificate will be updated every year, such as FDA and ROHS.

## Product Description

SNR's SNR-QSFP28-CLR4-2, QSFP28 transceiver module is designed for use in 103 Gigabit Ethernet links over 2Km single mode fiber. They are compliant with the IEEE 802.3ba.

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	Ts	-40	+85	°C
Supply Voltage	Vcc	-0.5	3.6	V
Operating Relative Humidity	RH	5	85	%

\*Exceeding any one of these values may destroy the device immediately.

## Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	T <sub>c</sub> SNR-QSFP28-CLR4-2	0		70	°C
Power Supply Voltage	Vcc	3.135	3.3	3.465	V

## Performance Specifications - Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
<b>Transmitter</b>						
Differential Input amplitude		150		1050	mv <sub>p-p</sub>	
Input Impedance (Differential)	Zin	85	100	115	ohms	Rin > 100 kohms @ DC
<b>Receiver</b>						
Differential output amplitude		200		1100	mv <sub>p-p</sub>	
Output Impedance (Differential)	Zout	85	100	115	ohms	

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## Optical Characteristics

### 100GBASE Operation

Parameter	Symbol	Min.	Typical	Max.	Unit
<b>Transmitter</b>					
Signaling Speed per Lane	BR <sub>AVE</sub>		25.78		Gbps
Data Rate Variation		-100		+100	ppm
Lane_0 Center Wavelength	$\lambda_{C0}$	1264.5		1277.5	nm
Lane_1 Center Wavelength	$\lambda_{C1}$	1284.5		1297.5	nm
Lane_2 Center Wavelength	$\lambda_{C2}$	1304.5		1317.5	nm
Lane_3 Center Wavelength	$\lambda_{C3}$	1324.5		1337.5	nm
Total Average Output Power*(Note3)	P <sub>o</sub>			8.5	dBm
Average Launch Power per Lane	P <sub>each</sub>	-6.5		2.5	dBm
Optical modulation amplitude	P <sub>oma</sub>	-4.0		2.5	dBm
Side Mode Suppression Ratio	SMSR	30			dB
Optical Return Loss Tolerance				20	dB
Extinction Ratio	ER	3.5			dB
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}*(Note4)		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}			
<b>Receiver</b>					
Signaling Speed per Lane	BR <sub>AVE</sub>		25.78		Gbps
Data Rate Variation		-100		+100	ppm
Damage threshold	R <sub>dam</sub>	5.5			dBm
Lane_0 Center Wavelength	$\lambda_{C0}$	1264.5		1277.5	nm
Lane_1 Center Wavelength	$\lambda_{C1}$	1284.5		1297.5	nm
Lane_2 Center Wavelength	$\lambda_{C2}$	1304.5		1317.5	nm
Lane_3 Center Wavelength	$\lambda_{C3}$	1324.5		1337.5	nm
Receive Sensitivity in OMA per Lane*(Note5)	P <sub>min</sub>			-10	dBm
Optical Return Loss	ORL			-26	dB
LOS Assert	LOSA	-24.6			dBm
LOS De-Assert	LOSD			-11.6	dBm
LOS Hysteresis*(Note6)		0.5			dB

Note3: Output is coupled into a 9/125 $\mu$ m single-mode fiber.

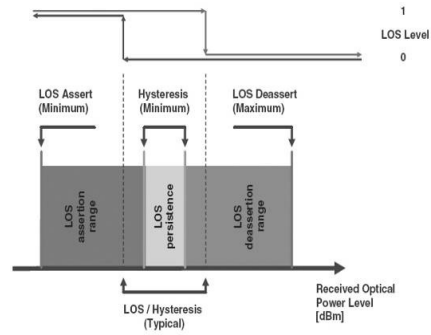
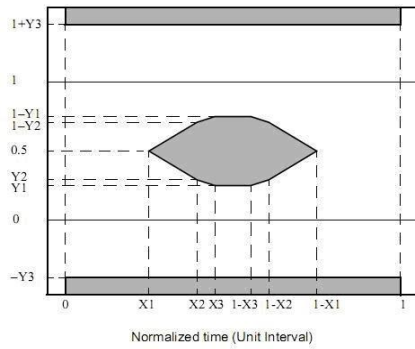
Note4: Hit ratio of 5x10<sup>-5</sup>

Note5: Minimum average optical power measured at BER less than 5E-5, with a 2<sup>31</sup>-1 PRBS.

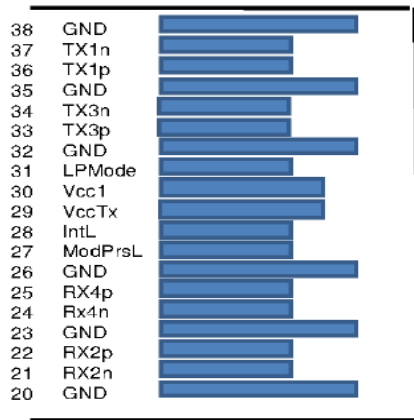
Note6: LOS Hysteresis

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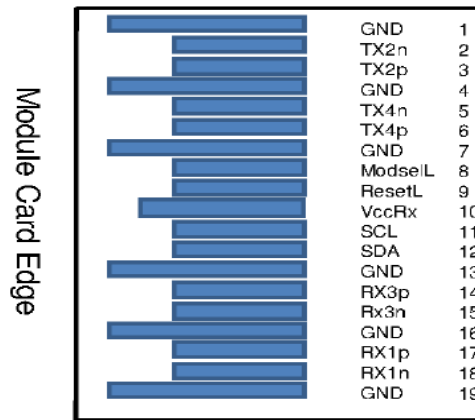
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## QSFP28 Transceiver Electrical Pad Layout



Top Side  
Viewed From Top



Bottom Side  
Viewed From Bottom

## Pin Arrangement and Definition

Pin	Logic	Symbol	Description	Plug Sequence	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	3	
7		GND	Ground	1	1
8	LVTTL-I	ModSelL	Module Select	3	
9	LVTTL-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	1

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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	LVTTTL-O	ModPrsL	Module Present	3	
28	LVTTTL-O	IntL	Interrupt	3	
29		VccTx	+3.3V Power supply transmitter	2	2
30		Vcc1	+3.3V Power supply	2	2
31	LVTTTL-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 Input	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Input	3	
38		GND	Ground	1	1

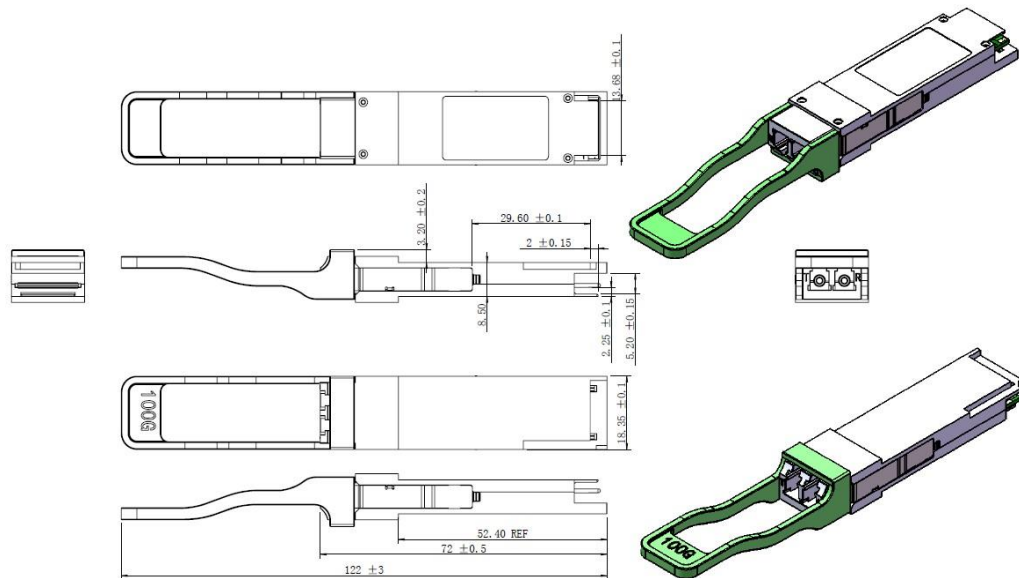
1: GND is the symbol for signal and supply (power) common for the QSFP28 module. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.

2: Vcc Rx, Vcc1 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 Table 6. Recommended host board power supply filtering is shown in Figures 3 and 4. Vcc Rx Vcc1 and Vcc Tx may be internally connected within the QSFP28 Module in any combination. The connector pins are each rated for a maximum current of 500mA.

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## Mechanical Specifications



### GUARANTEE:



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