SNR-QSFP28-SR4 Series

Multi-Mode QSFP28 Transceiver
RoHS6 Compliant

Features

- Supports 103.1Gbps and 112.2Gbps aggregate bit rates
- Single 3.3V Power Supply and Power dissipation < 3.5W
- Up to 70m transmission on MMF OM3 and 100m transmission on MMF OM4
- Hot-Pluggable QSFP28 Footprint
- Class 1 FDA and IEC60825-1 Laser Safety Compliant
- RoHS6 Compliant
- Operating Case Temperature
  Standard: 0℃~+70℃
- Compliant with QSFP28 MSA Specification
- I2C interface with integrated Digital Diagnostic Monitoring

Applications

- 100GBASE-SR4 Ethernet
- 128G Fiber Channel

Ordering Information

Part No.	Data Rate	Distance	Interface	Temp.	DDMI
SNR-QSFP28-SR4 SNR-QSFP28-SR4-OTU4	103.1Gbps 112.2 Gbps	MMF OM3 for 70m MMF OM4 for 100m	MPO	Standard	Yes

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 FCC, FDA and ROHS. For the latest certification information, please check with LLC NAG.

Absolute Maximum Ratings*note1

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	%

Note1: Exceeding any one of these values may destroy the device immediately.

Recommended Operating Conditions

Parameter	Symbol		Min.	Typical	Max.	Unit
Operating Case Temperature	T_C	SNR-QSFP28-SR4 SNR-QSFP28-SR4-OTU4	0		70	°C
Power Supply Voltage	Vcc		3.135	3.3	3.465	V
Power Consumption	P				3.5	W

Performance Specifications - Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
Input Amplitude (Differential)	Vin	150		1050	mVpp	AC coupled inputs*(Note6)
Input Impedance (Differential)	Zin	85	100	115	ohms	Rin > 100 kohms @ DC
Receiver						
Output Amplitude (Differential)	Vout	200		1100	mVpp	AC coupled outputs*(Note6)
Output Impedance (Differential)	Zout	85	100	115	ohms	
Output Rise/Fall Time	t_r/t_f		12		ps	20%~80%

Optical and Electrical Characteristics

100GBASE-SR4 Ethernet Operation

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Signaling Speed per Lane	BR_{AVE}		25.78		Gbps
Center Wavelength	λ_C	840	850	860	nm
Average Launch Power, Each Lane*(note2)	Pout/lane	-8.4		2.4	dBm
Optical modulation amplitude	Poma			3	dBm
Extinction Ratio	ER	3			dB
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}*(Note3)		IEEE 802.3bm 100Gbase-SR4			
Receiver					
Signaling Speed per Lane	BR_{AVE}	25.78		28.05	Gbps
Center Wavelength	λ_C	840	850	860	nm
Average Receive Power per Lane*(Note4)	Rpow	-10.3		2.4	dBm
Receive Sensitivity in OMA per Lane	Pmin			-5.2	dBm
LOS Assert	LOSA	-20			dBm
LOS De-Assert	LOSD			-12	dBm
LOS Hysteresis		0.5			dB

Note2: Output is coupled into a 50/125μm multi-mode fiber.

Note3: Filtered, measured with a PRBS 2^{31}-1 test pattern @25.78Gbps.

Note4: Minimum average optical power measured at BER less than 5E-5, with a 2^{31}-1 PRBS @25.78Gbps.

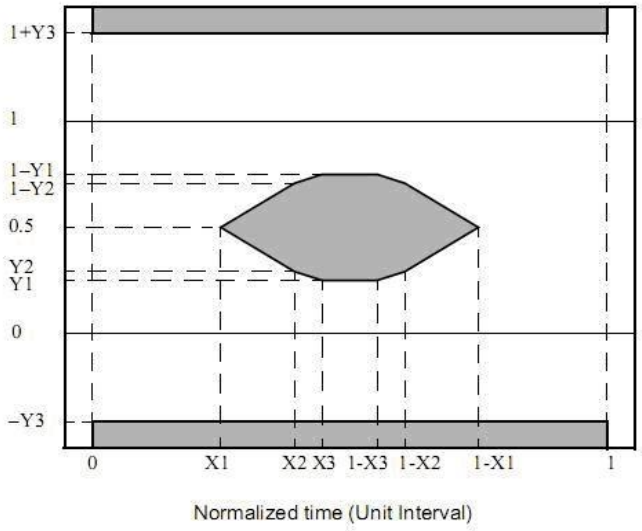


Figure1 Transmitter eye mask

OTU4 and 128G Fiber Channel Operation

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Signaling Speed per Lane	BR_{AVE}	27.95		28.05	Gbps
Center Wavelength	λ_C	840	850	860	nm
Average Launch Power, Each Lane*(note5)	Pout/lane	-2.5		2.4	dBm
Optical modulation amplitude	Poma			3	dBm
Extinction Ratio	ER	3			dB
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}*(Note6)		FC-PI-6			
Receiver					
Signaling Speed per Lane	BR_{AVE}	27.95		28.05	Gbps
Center Wavelength	λ_C	840	850	860	nm
Average Receive Power per Lane*(Note7)	Rpow	-6.4		2.4	dBm
LOS Assert	LOSA	-20			dBm
LOS De-Assert	LOSD			-12	dBm
LOS Hysteresis		0.5			dB

Note5: Output is coupled into a 50/125μm multi-mode fiber.

Note6: Filtered, measured with a PRBS 2^{31}-1 test pattern @28.05Gbps

Note7: Minimum average optical power measured at BER less than 1E-6, with a 2^{31}-1 PRBS @28.05Gbps.

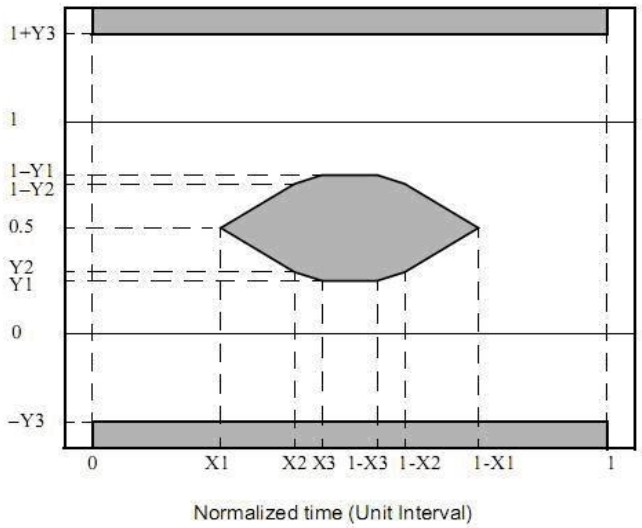
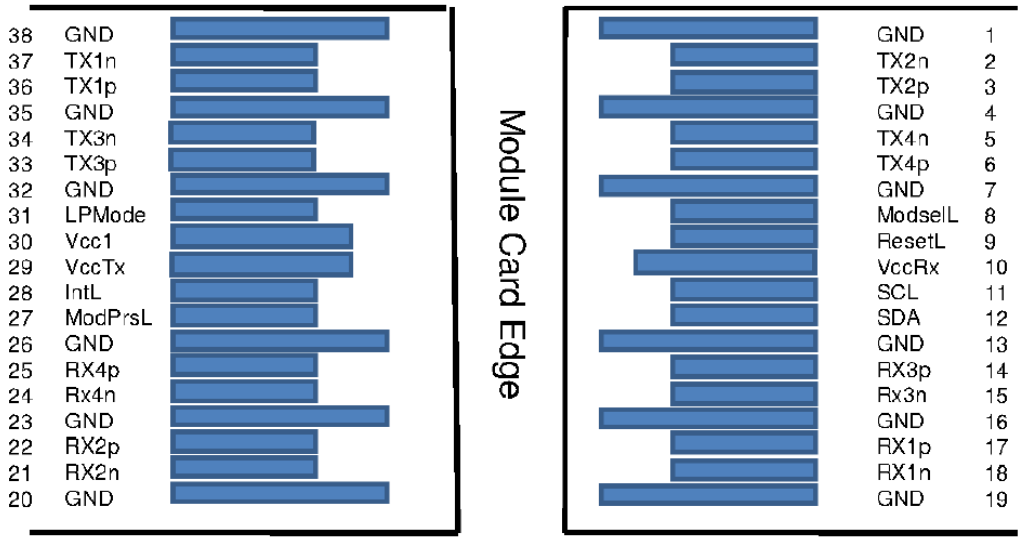


Figure2 Transmitter eye mask

QSFP28 Transceiver Electrical Pad Layout



Top Side
Viewed From Top

Bottom Side
Viewed From Bottom

Pin Function Definitions

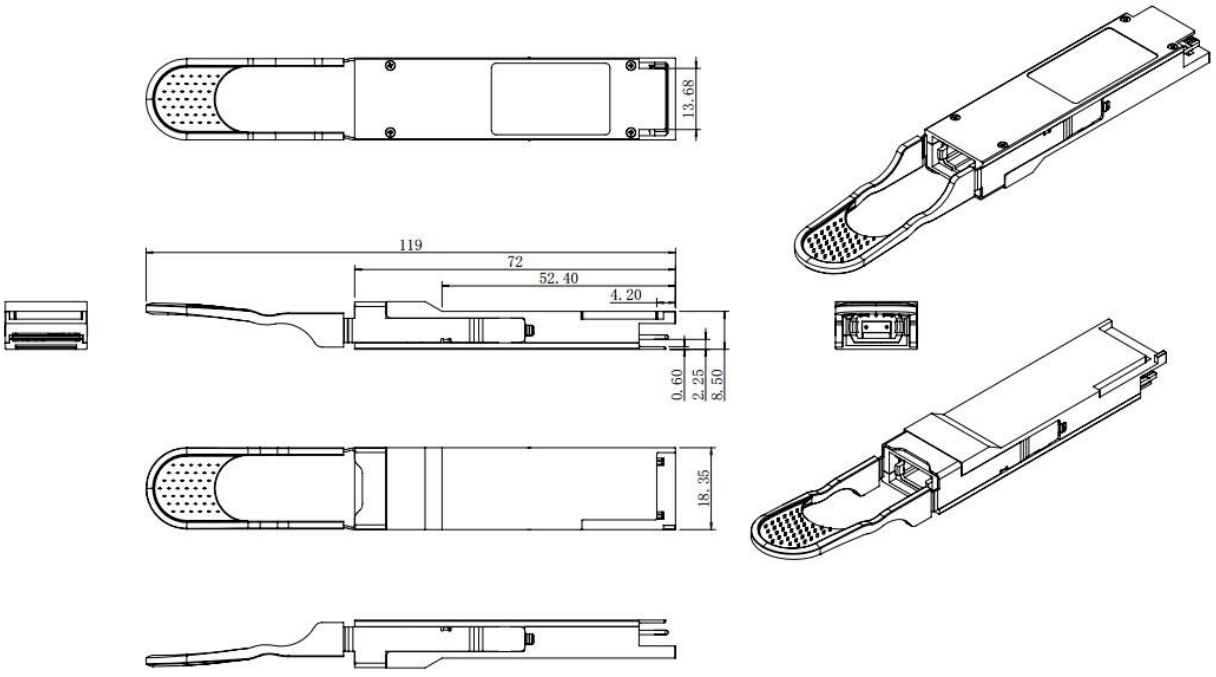
Pin	Logic	Symbol	Description	Plug Sequence	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	3	
7		GND	Ground	1	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	LVCMOS- I/O	SCL	2-wire serial interface clock	3	
12	LVCMOS- I/O	SDA	2-wire serial interface data	3	
13		GND	Ground	1	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	ModPrsL	Module Present	3	
28	LVTTL-O	IntL	Interrupt	3	
29		VccTx	+3.3V Power supply transmitter	2	2
30		Vcc1	+3.3V 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 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.

Mechanical Specifications



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