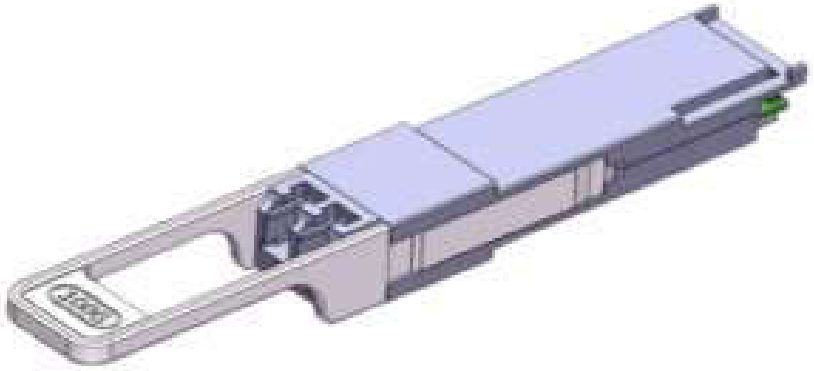
SNR-QSFP28-DXX-2

Single-Mode QSFP28 100G DWDM Transceiver

QSFP28 MSA Compliant

RoHS Compliant



Features

- Supports 100Gbps
- Available in all C-Band Wavelengths on the 100GHz DWDM ITU Grid
- Single 3.3V Power Supply
- Power dissipation < 5.5W
- 80km reach over SMF with EDFA & DCM(dispersion compensation modules)
- QSFP28 MSA Compliant
- SFF-8636 Rev 2.10a Compliant
- 4x25G electrical interface
- LC duplex connector
- Commercial case temperature range of 0°C to 70°C
- I2C interface with integrated Digital Diagnostic Monitoring
- Safety Certification: TUV/UL/FDA*Note1
- RoHS Compliant

Applications

- 100G Amplified DWDM networks
- Data center interconnects

Ordering Information

Part No.	Data Rate	Fiber	Distance	Interface	Temp.	DDMI
SNR-QSFP28-DXX-2*Note2	100Gbps	SMF	2 km	LC	0~+70℃	Yes

Note1: For the latest certification information, please check with NAG.
Note2: XX refers to DWDM Wavelength range as ITU-T specified, please refer the following table for detailed center wavelength information.

*The product image is only for reference purpose.

XX- Channel refers to the following table:

Channel (XX)	Part NO.	Frequency (THz)	Center Wavelength (nm)
15	SNR-QSFP28-D15-2	191.5	1565.50
16	SNR-QSFP28-D16-2	191.6	1564.68
17	SNR-QSFP28-D17-2	191.7	1563.86
18	SNR-QSFP28-D18-2	191.8	1563.05
19	SNR-QSFP28-D19-2	191.9	1562.23
20	SNR-QSFP28-D20-2	192.0	1561.42
21	SNR-QSFP28-D21-2	192.1	1560.61
22	SNR-QSFP28-D22-2	192.2	1559.79
23	SNR-QSFP28-D23-2	192.3	1558.98
24	SNR-QSFP28-D24-2	192.4	1558.17
25	SNR-QSFP28-D25-2	192.5	1557.36
26	SNR-QSFP28-D26-2	192.6	1556.55
27	SNR-QSFP28-D27-2	192.7	1555.75
28	SNR-QSFP28-D28-2	192.8	1554.94
29	SNR-QSFP28-D29-2	192.9	1554.13
30	SNR-QSFP28-D30-2	193.0	1553.33
31	SNR-QSFP28-D31-2	193.1	1552.52
32	SNR-QSFP28-D32-2	193.2	1551.72
33	SNR-QSFP28-D33-2	193.3	1550.92
34	SNR-QSFP28-D34-2	193.4	1550.12
35	SNR-QSFP28-D35-2	193.5	1549.32
36	SNR-QSFP28-D36-2	193.6	1548.51
37	SNR-QSFP28-D37-2	193.7	1547.72
38	SNR-QSFP28-D38-2	193.8	1546.92
39	SNR-QSFP28-D39-2	193.9	1546.12
40	SNR-QSFP28-D40-2	194.0	1545.32
41	SNR-QSFP28-D41-2	194.1	1544.53
42	SNR-QSFP28-D42-2	194.2	1543.73
43	SNR-QSFP28-D43-2	194.3	1542.94
44	SNR-QSFP28-D44-2	194.4	1542.14
45	SNR-QSFP28-D45-2	194.5	1541.35
46	SNR-QSFP28-D46-2	194.6	1540.56
47	SNR-QSFP28-D47-2	194.7	1539.77
48	SNR-QSFP28-D48-2	194.8	1538.98
49	SNR-QSFP28-D49-2	194.9	1538.19
50	SNR-QSFP28-D50-2	195.0	1537.40
51	SNR-QSFP28-D51-2	195.1	1536.61
52	SNR-QSFP28-D52-2	195.2	1535.82
53	SNR-QSFP28-D53-2	195.3	1535.04
54	SNR-QSFP28-D54-2	195.4	1534.25
55	SNR-QSFP28-D55-2	195.5	1533.47

Channel (XX)	Part NO.	Frequency (THz)	Center Wavelength (nm)
56	SNR-QSFP28-D56-2	195.6	1532.68
57	SNR-QSFP28-D57-2	195.7	1531.90
58	SNR-QSFP28-D58-2	195.8	1531.12
59	SNR-QSFP28-D59-2	195.9	1530.33
60	SNR-QSFP28-D60-2	196.0	1529.55
61	SNR-QSFP28-D61-2	196.1	1528.77

Product Description

SNR-QSFP28-DXX-2 series single mode transceiver is designed for use duplex optical data communications. This module is designed for single mode fiber and operates at a nominal DWDM wavelength from 1528.77nm to 1565.50nm as specified by the ITU-T, operating at 50Gbaud data rate. The electrical interface of the module is compliant with the OIF CEI-28G-VSR and compliant with QSFP28 MSA. It is designed to deploy in the DWDM networking equipment in metropolitan access and core networks.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	Ts	-40	+85	°C
Supply Voltage	Vcc	-0.5	3.6	V
Damage threshold	Rxdmg	5.5		dBm

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

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating case temperature	Tc	0		70	°C
Power supply voltage	Vcc	3.135	3.3	3.465	V
Operating relative humidity	RH	5		85	%
Power dissipation	P_D			5.5	W

Performance Specifications - Electrical

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Differential data input swing per lane		900			mV_{p-p}	
Differential input impedance	Zin	90	100	110	ohm	
DC common mode voltage(Vcm)		-350		2850	mV	
Receiver						
Differential output amplitude				900	mV_{p-p}	
Differential output impedance	Zout	90	100	110	ohm	
Output Rise/Fall Time	t_r/t_f	12			ps	20%~80%

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Eye width		0.57			UI	
Eye height differential		228			mV	@TP4, 1E-15
DC common mode voltage (Vcm)		-350		2850	mV	1

Notes:
1. Vcm is generated by the host. Specification includes effects of ground offset voltage

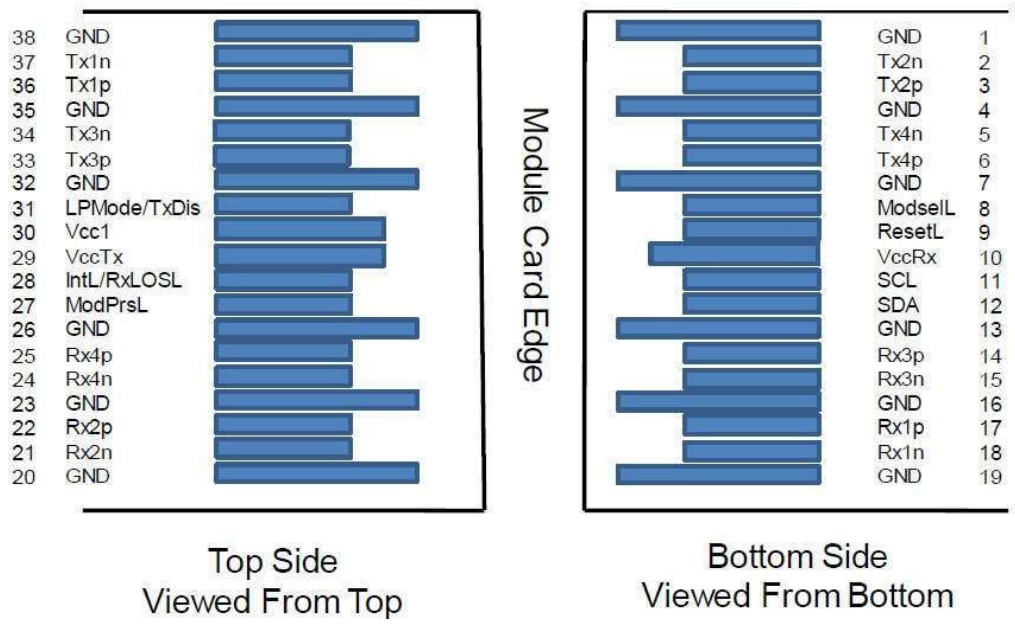
Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Signaling speed			53.125		Gbaud
Center Wavelength Spacing			100		GHz
			0.8		nm
Spectral Width (-20dB)	Δλ			0.3	nm
Modulation format			PAM4		
Deviation From Central Frequency@EOL		-12.5		12.5	GHz
Side-mode suppression ratio	SMSR	30			dB
Extinction ratio	ER	3.5			dB
Transmit OMA	TxOMA	-0.2		4.2	dBm
Transmit average*(1)	TxAVG	-2.4		4	dBm
Launch Power in OMA_{outer} minus TDECQ*(2)		-1.6			dBm
Launch Power in OMA_{outer} minus TDECQ*(3)		-1.5			dBm
Transmitter and dispersion eye closure	TDECQ			3.4	dB
Dispersion Tolerance	DT		40		ps/nm
Optical return loss tolerance*(4)				17.1	dB
Receiver					
Signaling speed			53.125		Gbaud
Center wavelength	λC	1528		1566	nm
Damage threshold		5.5			dBm
Receive power (OMA_{outer})	RxOMA			4.7	dBm
Average receive power	RxAVG	-6.4		4.5	dBm
Receiver sensitivity (OMA_{outer}),*(5)	SenOMA			Max (-4.5, SECQ-5.9)	dBm
Receiver reflectance				-26	dB
LOS Assert	LOSA	-15			dBm
LOS De-Assert	LOSD			-12	dBm
LOS Hysteresis		0.5			dB

Note1: 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.

Note2：for ER≥4.5dB.
Note3：for ER<4.5dB.
Note4: Transmitter reflectance is defined looking into the transmitter.
Note5: Sensitivity is specified at 2.4x10-4 BER.

QSFP28 Transceiver Electrical Pad Layout

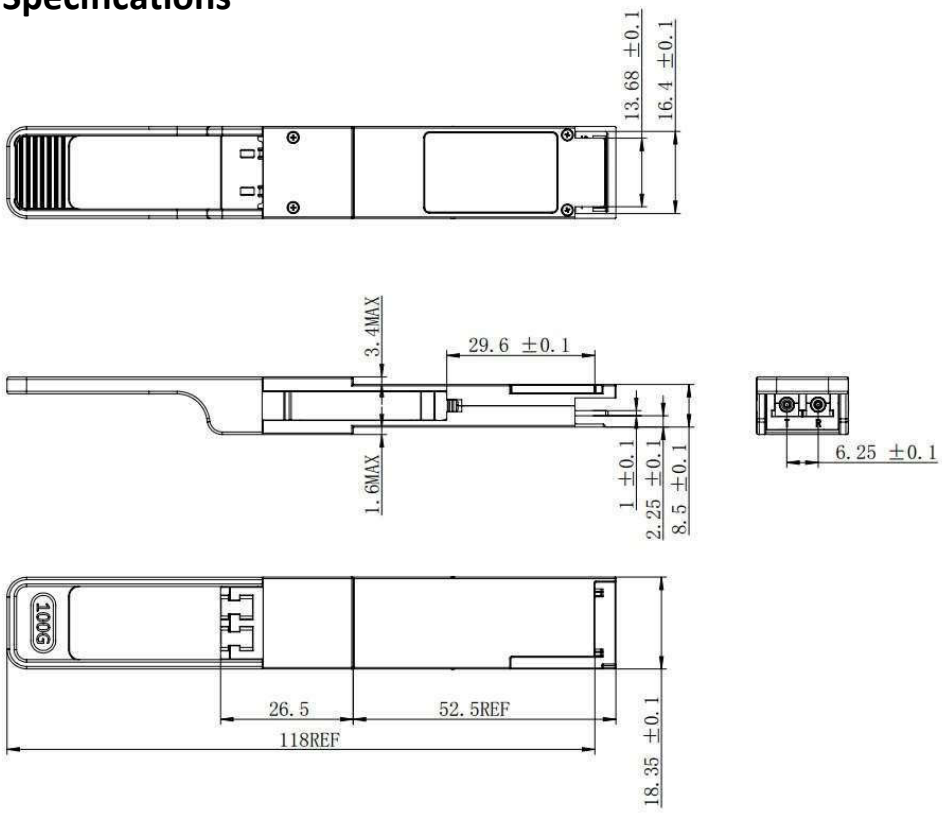


Pin Arrangement and Definition

Pin	Logic	Symbol	Description	Notes
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	
7		GND	Ground	1
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2
11	LVCMOS- I/O	SCL	2-wire serial interface clock	
12	LVCMOS- I/O	SDA	2-wire serial interface data	
13		GND	Ground	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	

Pin	Logic	Symbol	Description	Notes
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL/ RxLOSL	Interrupt. Optionally Configurable As RxLOSL Via The Management Interface (SFF-8636).	
29		VccTx	+3.3V Power supply transmitter	2
30		Vcc1	+3.3V Power supply	2
31	LVTTL-I	LPMode/ TxDis	Low Power Mode. Optionally Configurable As TxDis Via The Management Interface (SFF-8636).	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Input	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Input	
38		GND	Ground	1
1: GND is the symbol for signal and supply (power) common for QSFP28 modules. 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: VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 1000mA.				

Mechanical Specifications



GUARANTEE:

Contact Information:

Address: Russian Federation, Ekaterinburg, Predelnaya st. 57/2

Tel: +7(343) 379-98-38

Fax: +7(343) 379-98-38

E-mail: info@nag.ru

Online shop: http://shop.nag.ru