



Q28QD020C02F000

MSA Compliant 100GBase-4WDM-20 QSFP28 Transceiver (SMF, 1295nm to 1309nm, 20km, LC, DOM, -40 to 85C)

Product Description

This MSA compliant QSFP28 transceiver provides 100GBase-4WDM-20 throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1295nm to 1309nm via an LC connector. It is also capable of withstanding rugged environments and can operate at temperatures between -40 to 85C. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

- QSFP28 MSA compliant
- Single 3.3V Power Supply and Power dissipation < 4.8W
- Supports 103Gbps
- Operating case temperature: -40C to 85C
- Four 25Gbps DFB-based LAN-WDM transmitter
- Up to 20km over SMF
- 4x25G electrical interface
- PIN and TIA array on the receiver side
- I2C interface with integrated Digital Diagnostic Monitoring
- Duplex LC receptacles
- RoHS compliant



Applications:

- 100GBASE-4WDM-20 100G Ethernet
- Access and Enterprise

For your product safety, please read the following information carefully before any manipulation of the transceiver:



ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5		3.6	V
Storage Temperature	TS	-40		+85	°C
Operating Case Temperature	Tc	-40	25	85	°C
Operating Relative Humidity	RH	5		85	%
Receiver Damage Threshold, per Lane	Rxdmg	5.5			dBm

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Dissipation	PD			4.8	W	
Transmitter						
Differential data input swing per lane				900	mvp-p	
Input Impedance (Differential)	Zin			10	%	
Stressed Input Parameters						
Eye width		0.46			UI	
Applied pk-pk sinusoidal jitter		IEEE 802.3bm Table 88-13				
Eye height		95			mv	
DC common mode voltage		-350		2850	mv	
Receiver						
Differential output amplitude		200		900	mvp-p	
Output Impedance (Differential)	Zout			10	%	
Output Rise/Fall Time	tr/tf	12			ps	20%~80%
Eye width		0.57			UI	
Eye height differential		228			mv	
Vertical eye closure				5.5	dB	

Optical Characteristics

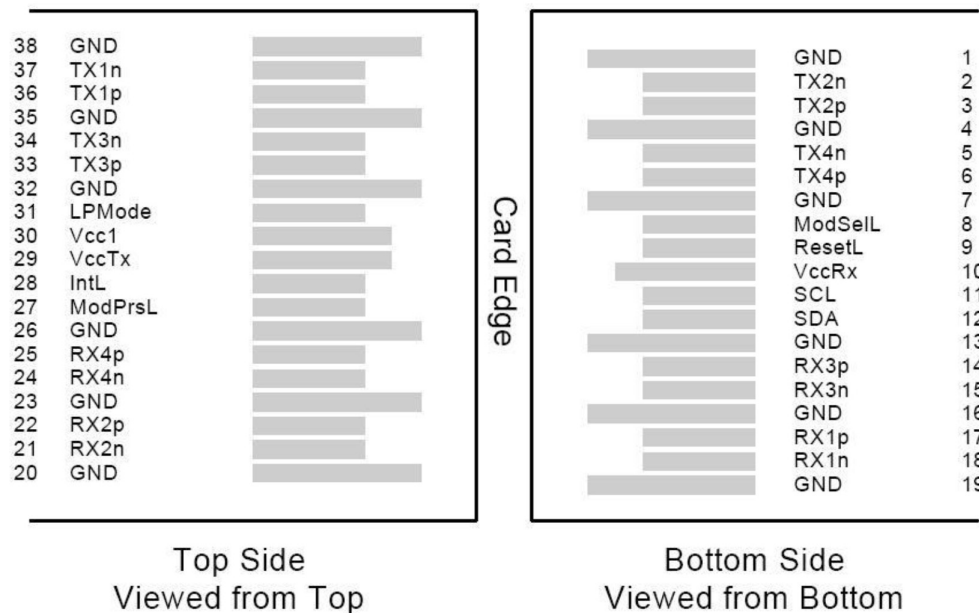
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Signaling Speed per Lane	BRAVE		25.78		Gbps	
Data Rate Variation		-100		+100	ppm	
Lane_0 Center Wavelength	λ_{C0}	1294.53	1295.56	1296.59	nm	
Lane_1 Center Wavelength	λ_{C1}	1299.02	1300.05	1301.09	nm	
Lane_2 Center Wavelength	λ_{C2}	1303.54	1304.58	1305.63	nm	
Lane_3 Center Wavelength	λ_{C3}	1308.09	1309.14	1310.19	nm	
Total Average Output Power	Po			10.5	dBm	
Average Launch Power per Lane	Peach	-4.3		4.5	dBm	1
Optical Modulation Amplitude (OMA) each Lane	TxOMA	-1.3		4.5	dBm	
Difference in launch power between any two lanes (OMA)				5	dBm	
Launch power in OMA minus TDP, each lane		-2.3			dBm	
Transmitter and dispersion penalty (TDP), each lane				2.8	dB	
Extinction Ratio	ER	4			dB	
Side-mode suppression ratio	SMSRmin	30			dB	
Average launch power of OFF transmitter per lane				-30	dBm	
Relative Intensity Noise	RIN			-130	dB/hz	
Transmitter Reflectance				-26	dB	
Optical Return Loss Tolerance				20	dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				2
Receiver						
Signaling Speed per Lane	BRAVE		25.78		Gbps	
Data Rate Variation		-100		+100	ppm	
Damage threshold per Lane	Rxdmg	5.5			dBm	
Lane_0 Center Wavelength	λ_{C0}	1294.53	1295.56	1296.59	nm	
Lane_1 Center Wavelength	λ_{C1}	1299.02	1300.05	1301.09	nm	
Lane_2 Center Wavelength	λ_{C2}	1303.54	1304.58	1305.63	nm	
Lane_3 Center Wavelength	λ_{C3}	1308.09	1309.14	1310.19	nm	
Average Receive Power per Lane	Rxpow	-14.5		4.5	dBm	3
Receive Power (OMA) per Lane	RxOMA			4.5	dBm	
Receive Sensitivity in OMA per Lane	Rxsens			-12.5	dBm	
Stressed Receiver Sensitivity (OMA) per Lane	RXSRS			-10	dBm	4
Optical Return Loss	ORL			-26	dB	
LOS Assert	LOSA	-25			dBm	

LOS De-Assert	LOSD		-15	dBm	
LOS Hysteresis		0.5		dB	
Conditions of Receiver Sensitivity Test					
Vertical Eye Closure Penalty	VECP	2.5		dB	5
Stressed Eye J2 Jitter	J2	0.33		UI	5
Stressed Eye J9 Jitter	J9	0.48		UI	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. Hit ratio 5×10^{-5} .
3. 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.
4. Measured with conformance test signal at TP3 for BER = 10⁻¹².
5. Vertical eye closure penalty, stressed eye J2 Jitter, and stressed eye J9 Jitter are test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

Electrical Pin-out Details



Pin Descriptions

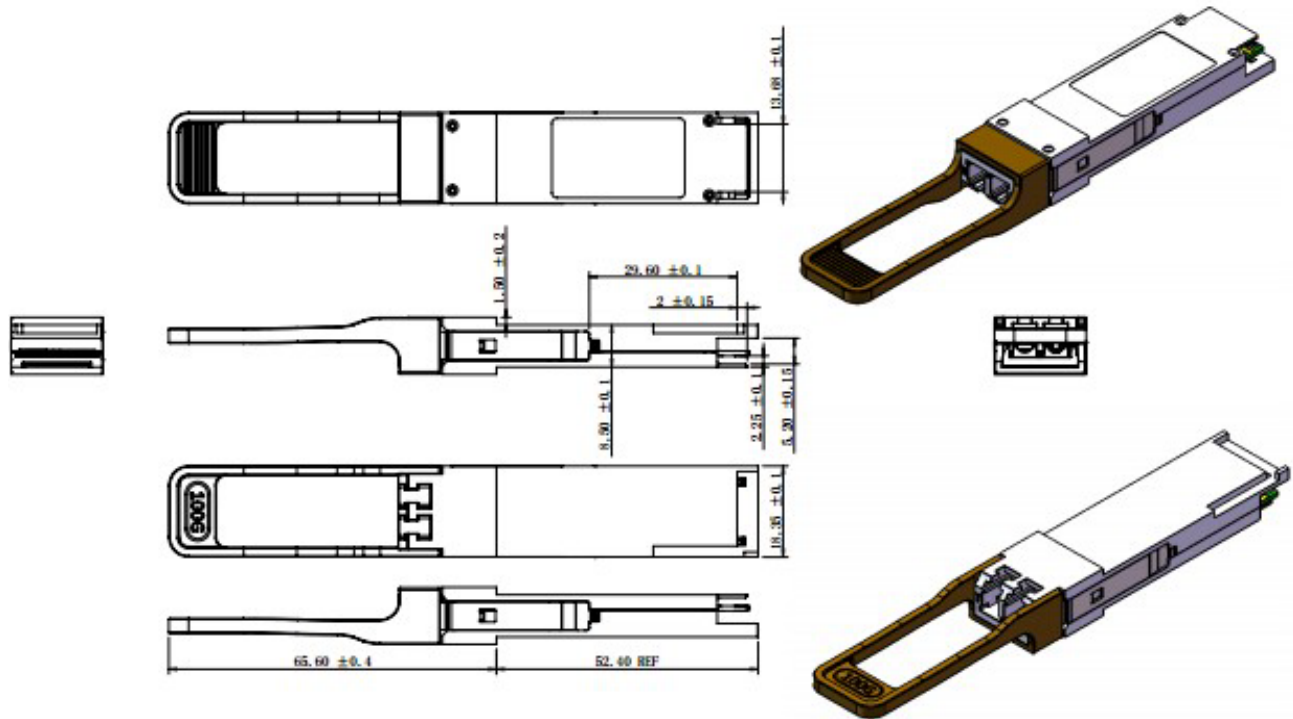
Pin	Logic	Symbol	Name/Descriptions	Plug Sequence	Ref.
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	3	
7		GND	Ground	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		Vccl	+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

Notes:

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. VccRx, Vcc1 and VccTx 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



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

