

PRO-VISA-QSW4

MSA and TAA Compliant 100GBase-SWDM4 QSFP28 Transceiver (MMF, 850nm, 100m, LC, DOM)

Features

- SFF-8665 Compliance
- Duplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Multi-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



Applications:

- 100GBase Ethernet
- Access and Enterprise

Product Description

This MSA Compliant QSFP28 transceiver provides 100GBase-SWDM4 throughput up to 100m over OM4 multi-mode fiber (MMF) using a wavelength of 850nm via an LC connector. 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. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products.



Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	TS	-40		85	°C	
Case Operating Temperature	TOP	0		70	°C	1
Relative Humidity	RH	15		85	%	2
Receiver Damage Threshold, per Lane	PRdmg	3.8			dBm	

Notes:

1. Temporary excursions case operating temperature of -5 to -75 °C not exceeding 72 hours.
2. Non-condensing.

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Supply Voltage	Vcc	3.135		3.465	V	
Supply Current	Icc			1.5	A	
Module total power	P			3.5	W	1
Transmitter						
Signaling rate per lane		25.78125 ± 100ppm			Gb/s	
Differential pk-pk input voltage tolerance	V _{in,pp,diff}			900	mV	
Single-ended voltage tolerance	V _{in,pp}	-0.35		+3.3	V	
Module stress input test	Per Section 83E.3.4.1, IEEE 802.3bm					
Receiver						
Signaling rate per lane		25.78125 ± 100ppm			Gb/s	
Differential data output swing	V _{out,pp}	100		400	mVpp	2
		300		600		
		400	600	800		
		600		1200		
Eye width		0.57			UI	
Eye height, differential		228			mV	
Vertical eye closure	VEC	5.5			dB	

Transition time (20% to 80%)	tr, tf	12			ps	
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Notes:

1. Maximum total power value is specified across the full temperature and voltage range.
2. Output voltage is settable in 4 discrete ranges via I2C. Default range is Range 2 (400 – 800 mV).

Optical Characteristics

Parameter	Symbol	$\lambda 1$	$\lambda 2$	$\lambda 3$	$\lambda 4$	Unit	Notes
Transmitter							
Signaling Speed per Lane			25.78125 ± 100ppm			Gb/s	1
Lane center wavelengths (range)	λ	850	880	910	940	nm	
RMS Spectral Width	SW	0.59	0.59	0.59	0.59	nm	
Tx _{OMA} min at max TDEC		-3	-3	-3	-2.9	dBm	
TDEC (OM3)	TDEC	3.3	3.5	3.7	4.2	dB	
Tx _{OMA} - TDEC	P-TDEC	-6.3	-6.5	-6.7	-7.1	dBm	
Tx _{OMA} min	TxOMA	-5.5	-5.5	-5.5	-5.5	dBm	
Relative Intensity Noise	RIN		-130			dB/Hz	2
Optical Extinction Ratio	ER	2	2	2	2	dB	
Optical Return Loss Tolerance	ORL		12			dB	
Average launch power of OFF transmitter, per lane			-30			dBm	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}			{0.3,0.38,0.45,0.35,0.41,0.5}				3
Receiver							
Signaling Speed per Lane			25.78125 ± 100ppm			GBd	4
Lane center wavelengths (range)	λ	850	880	910	940	nm	
Damage Threshold	DT	3.8	3.8	3.8	3.8	dBm	
Average Receive Power per Lane (min)	RXPmin	-9.5	-9.4	-9.4	-9.4	dBm	
Average Receive Power per Lane (max)	RXPmax	3.4	3.4	3.4	3.4	dBm	
Receiver Reflectance (max)	Rfl		-12			dB	
Stressed Receiver Sensitivity (OMA) per Lane	SRS	-5.2	-5.2	-5.2	-5.2	dBm	5
Back to Back Receiver Sensitivity (OMA) per Lane	RxSens	-8.2	-8.4	-8.6	-8.8	dBm	6
Stressed Conditions:							
Stressed eye closure	SEC	3.3	3.5	3.7	4.2	dB	
Stressed eye J2 jitter	J2		0.39			UI	

Stressed eye J4 jitter	J4		0.53	UI	
Stressed Receiver Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}			{0.28,0.5,0.5,0.33,0.33,0.4}		7
LOS De-Assert (max)	LOSD		-11	dBm	8
LOS Assert (min)	LOSA		-30	dBm	8
LOS Hysteresis			0.5	dB	

Notes:

1. Transmitter consists of 4 lasers and a 4:1 optical multiplexer.
2. Informative, link controlled by TDEC
3. Hit Ratio 1.5×10^{-3} hits/sample.
4. Receiver consists of a 1:4 optical de-multiplexer and 4 photodetectors.
5. 5×10^{-5} BER (pre-FEC).
6. Unstressed receiver sensitivity is information and assumes 5×10^{-5} BER (pre-FEC).
7. Hit Ratio 5×10^{-5} hits/sample.
8. DC values.

Link Budget

Parameter	Symbol	Min	Typ	Max	Units	Notes
Bit Rate (all wavelengths combined)	BR		103.10		Gb/s	
Bit Error Rate	BER			5×10^{-5}		1
Insertion Loss	IL			1.8	dB	2
Maximum Supported Distances						
Fiber Type						
OM3 MMF	Lmax1			75	m	3
OM4 MMF	Lmax2			100	m	3
OM5 MMF	Lmax3			150	m	3

Notes:

1. Tested with a $2^{31} - 1$ PRBS at 25.78125 Gb/s
2. 850 nm channel can tolerate 1.9 dB insertion loss
3. Specified at 103.1Gb/s. Requires RS-FEC on the host to support maximum distance.

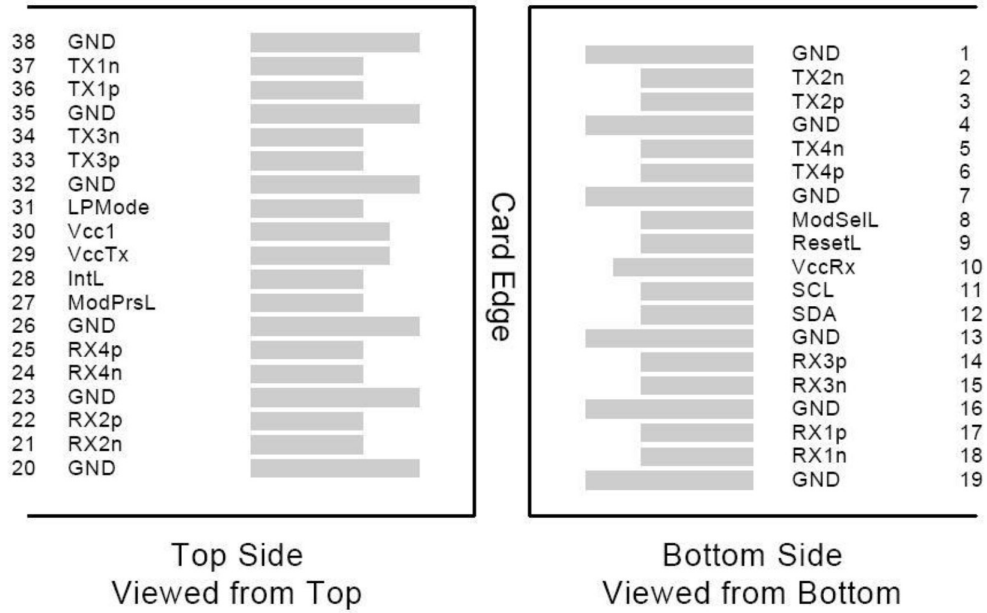
Pin Descriptions

Pin	Logic	Symbol	Name/Descriptions	Ref.
1		GND	Module Ground	1
2	CML-I	Tx2-	Transmitter inverted data input	
3	CML-I	Tx2+	Transmitter non-inverted data input	
4		GND	Module Ground	1
5	CML-I	Tx4-	Transmitter inverted data input	
6	CML-I	Tx4+	Transmitter non-inverted data input	
7		GND	Module Ground	1
8	LVTTTL-I	MODSEIL	Module Select	2
9	LVTTTL-I	ResetL	Module Reset	2
10		VCCRx	+3.3v Receiver Power Supply	
11	LVC MOS-I	SCL	2-wire Serial interface clock	2
12	LVC MOS-I/O	SDA	2-wire Serial interface data	2
13		GND	Module Ground	1
14	CML-O	RX3+	Receiver non-inverted data output	
15	CML-O	RX3-	Receiver inverted data output	
16		GND	Module Ground	1
17	CML-O	RX1+	Receiver non-inverted data output	
18	CML-O	RX1-	Receiver inverted data output	
19		GND	Module Ground	1
20		GND	Module Ground	1
21	CML-O	RX2-	Receiver inverted data output	
22	CML-O	RX2+	Receiver non-inverted data output	
23		GND	Module Ground	1
24	CML-O	RX4-	Receiver inverted data output	
25	CML-O	RX4+	Receiver non-inverted data output	
26		GND	Module Ground	1
27	LVTTTL-O	ModPrsL	Module Present, internal pulled down to GND	
28	LVTTTL-O	IntL	Interrupt output should be pulled up on host board	2
29		VCCTx	+3.3v Transmitter Power Supply	
30		VCC1	+3.3v Power Supply	
31	LVTTTL-I	LPMODE	Low Power Mode	2
32		GND	Module Ground	1
33	CML-I	Tx3+	Transmitter non-inverted data input	
34	CML-I	Tx3-	Transmitter inverted data input	
35		GND	Module Ground	1
36	CML-I	Tx1+	Transmitter non-inverted data input	
37	CML-I	Tx1-	Transmitter inverted data input	
38		GND	Module Ground	1

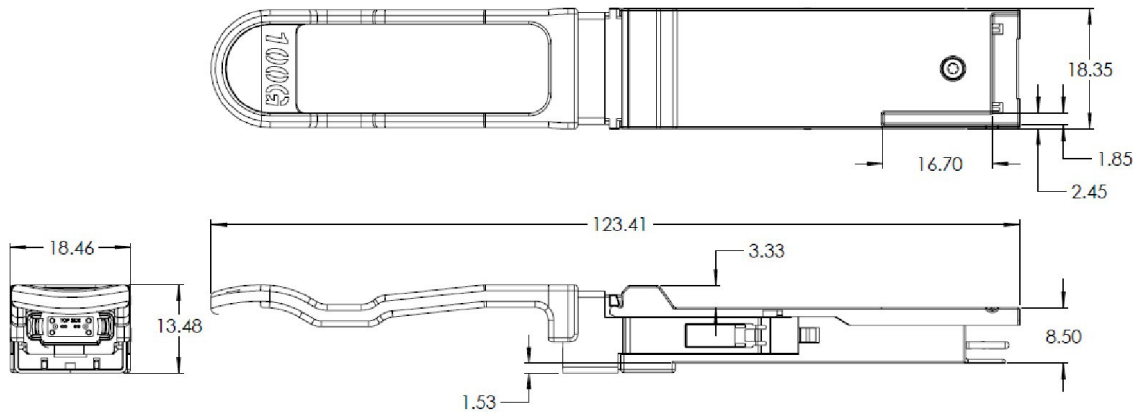
Notes:

1. Module circuit ground is isolated from module chassis ground with in the module.
2. Open collector; should be pulled up with 4.7k-10k ohms on host board to a voltage between 3.15V and 3.6V.

Electrical Pin-out Details



Mechanical Specifications



About Us:

Proline Options is one of North America's leading providers of transceivers and high speed cabling. With a reputation for quality, tested products that cover the connectivity spectrum, Proline Options has a solution for you regardless of the specification.

At Proline Options, every product is tested in its intended application - never batch or spec tested only. We run bandwidth, distance and IOS network tests. We have documented an impressive 0.03% failure rate over the last 10 years. To continue this rate of success we invest millions annually in our own on-site testing lab.

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