

02312MLF-PRO

Huawei® 02312MLF Compatible TAA Compliant 50GBase-ZR2 QSFP28 Transceiver (SMF, 1310nm, 80km, LC, DOM)

Features:

- QSFP28 MSA compliant
- Hot pluggable 38 pin electrical interface
- 2 LAN-WDM lanes MUX/DEMUX design
- 2x25G electrical interface
- Maximum power consumption 5W
- LC duplex connector
- Supports 51.5625Gb/s aggregate bit rate
- Up to 80km transmission on single mode fiber with KR4 FEC
- Operating case temperature: 0°C to 70°C
- Single 3.3V power supply
- RoHS 2.0 compliant



Applications

- 50GBASE-ZR Ethernet
- Telecom networking

Product Description

This Huawei® 02312MLF compatible QSFP28 transceiver provides 50GBase-ZR2 throughput up to 80km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Huawei® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. It is built to meet or exceed the specifications of Huawei®, as well as to comply with MSA (Multi-Source Agreement) standards to ensure seamless network integration. 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

Feature	Standard	Performance
Safety		
TUV	EN 60950-1	TUV certificate
	EN/IEC 60825-1:2007, Edition 2	
	EN/IEC 60825-1:2014, Edition 3	
	EN/IEC 60825-2:2004+A1:2006+A2:2010	
Electromagnetic Compatibility		
Radiated emissions	EMC Directive 2014/30/EU	Class B digital device with a minimum -6dB margin to the limit when tested with a metal enclosure. Final margin may vary depending on system application, good system EMI design practice, ie: suitable metal enclosure and well-bonding, is required to achieve Class B margins at the system level. Tested frequency range: 30 MHz to 40 GHz or 5th harmonic (5 times the highest frequency), whichever is less.
	EN 55032	
	CISPR 32	
	AS/NZS CISPR 32	
ESD	EN 55024	Withstands discharges of ± 8 kV contact, ± 15 kV air.
	CISPR 24	
	IEC/EN 61000-4-2	
Radiated immunity	EN 55024	Field strength of 10 V/m from 80MHz to 6 GHz.
	CISPR 24	
	IEC/EN 61000-4-3	
Restriction of Hazardous Substances		
RoHS	EU Directive 2011/65/EU (EU) 2015/863	

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Maximum Supply Voltage	Vcc	0		3.6	V
Storage Temperature	Ts	-40		85	°C
Operating Case Temperature	Top	0		70	°C
Relative Humidity (Non-condensing)	RH	15		85	%
Damage Threshold, each lane	THd	-2.3			dBm
Link Distance with G.652				80	km

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Dissipation	PD			5.0	W	
Supply Current	Icc			1.4430	A	Steady state
Transmitter						
Data Rate, each lane			25.78125		Gbps	
Differential Voltage pk-pk	Vpp			900	mV	At 1 MHz
Common Mode Voltage	Vcm	-350		2850	mV	
Transition time	Trise/Tfall	10			ps	20%~80%
Differential Termination Resistance Mismatch				10	%	
Eye width	EW15	0.46			UI	
Eye height	EH15	95			mV	
Receiver						
Data Rate, each lane			25.78125		Gbps	
Differential Termination Resistance Mismatch				10	%	At 1 MHz
Differential output voltage swing	Vout, pp			900	mV	
Common Mode Noise, RMS	Vrms			17.5	mV	
Transition time	Trise/Tfall	12			ps	20%~80%
Eye width	EW15	0.57			UI	
Eye height	EH15	228			mV	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Signaling Speed per Lane		25.78125 ± 100 ppm			Gb/s	
Lane_0 Transmit Wavelength	λ_{C0}	1294.53		1296.59	nm	
Lane_1 Transmit Wavelength	λ_{C1}	1299.02		1301.09	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	P_o	5.0		9.5	dBm	
Average Launch Power, Each Lane	P_{each}	2.0		6.5	dBm	
Difference in launch power between any two lanes (Average and OMA)				3	dBm	
Average launch power of OFF transmitter, each lane	P_{off}			-30	dBm	
Extinction Ratio	ER	6			dB	
RIN OMA				-130	dB/Hz	
Optical Return Loss Tolerance	ORL			20	dB	
Transmitter Reflectance				-12	dB	
Mask Margin		5			%	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				1
Receiver						
Signaling Speed per Lane		25.78125 ± 100 ppm			Gb/s	
Lane_0 Receive Wavelength	λ_{C0}	1294.53		1296.59	nm	
Lane_1 Receive Wavelength	λ_{C1}	1299.02		1301.09	nm	
Average receiver power, each lane	Rx_{pow}	-28		-3.5	dBm	
Receiver reflectance				-26	dB	
Receiver sensitivity Average, each lane	Rx_{sens}			-28	dBm	1
Receiver 3 dB electrical upper cutoff frequency, each lane				31	GHz	
Damage threshold, each lane	P_{damage}	-2.3			dBm	
Saturation Power, each lane		-7			dBm	

Notes:

1. Sensitivity is specified at BER@5E-5 with FEC.

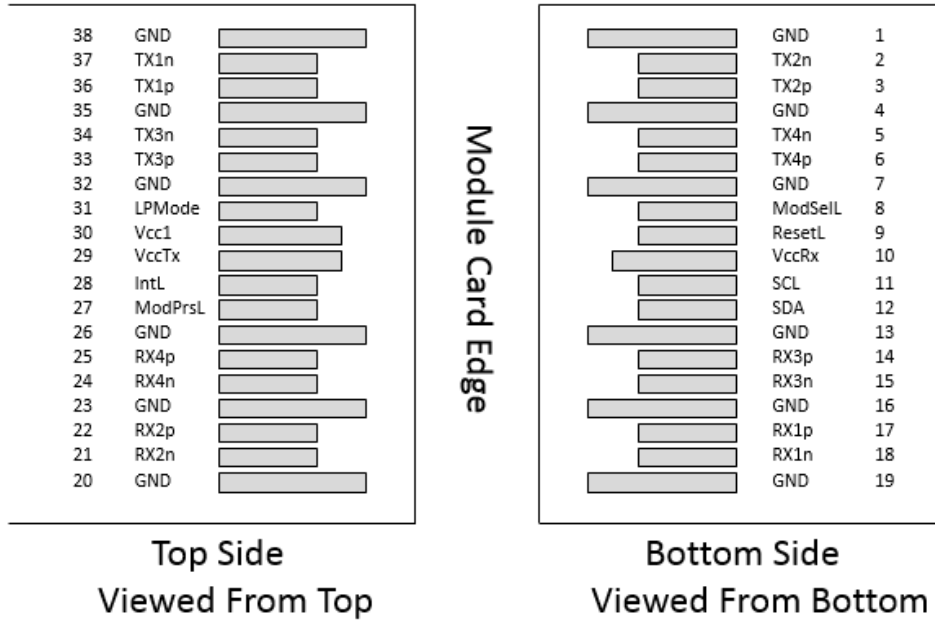
Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Not Used	
6	Tx4p	Not Used	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Not Used	
15	Rx3n	Not Used	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Not Used	
25	Rx4p	Not Used	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power supply	
31	LPMODE	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Not Used	
34	Tx3n	Not Used	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

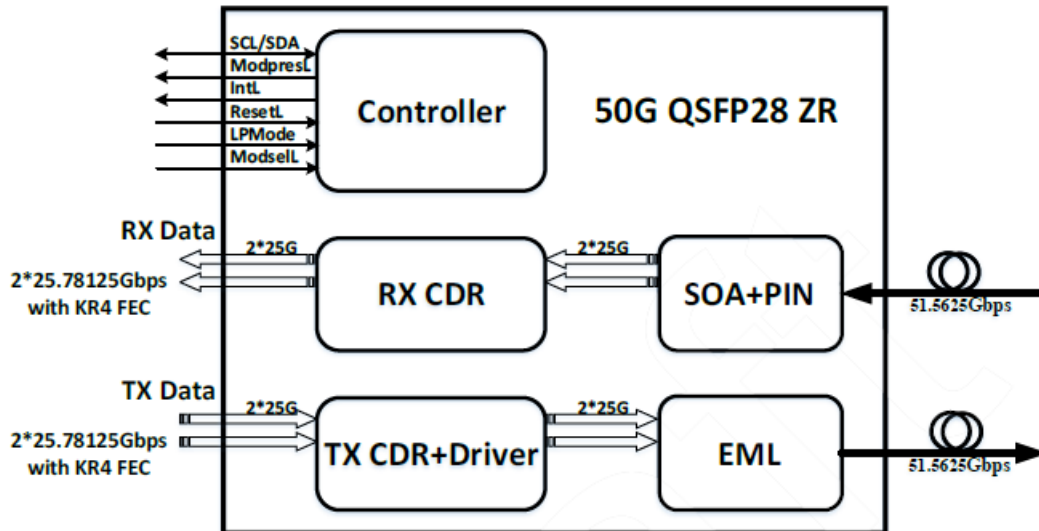
Notes:

1. Circuit ground is internally isolated from chassis ground.

Electrical Pin-out Details



Transceiver Block Diagram



Digital Diagnostic Monitoring Functions

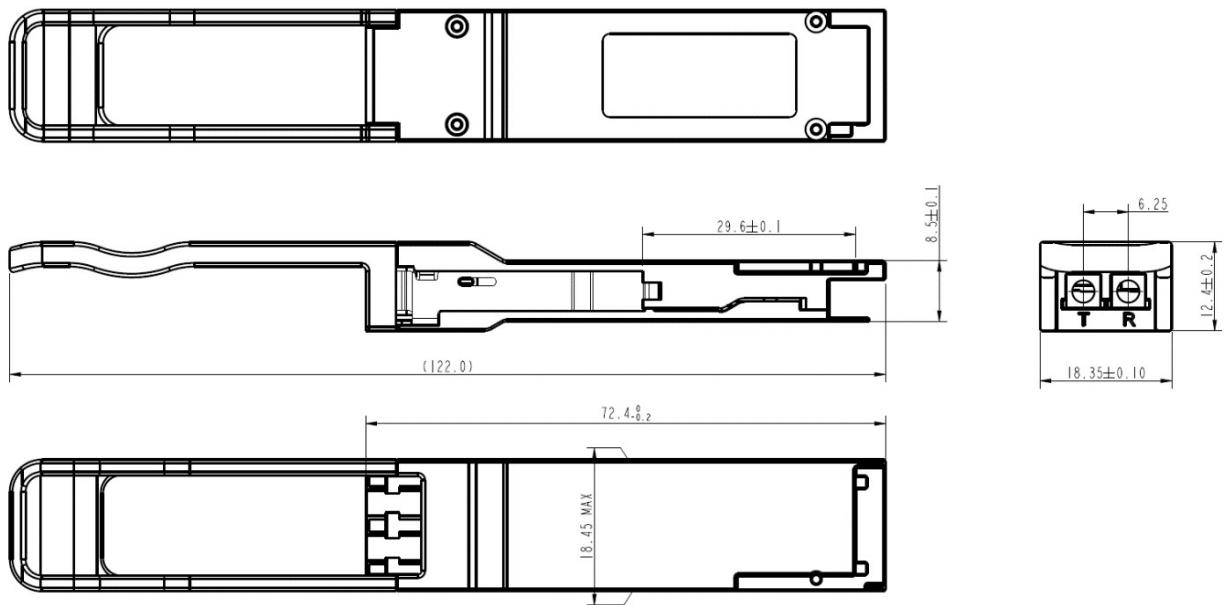
This module support the I2C-based Diagnostic Monitoring Interface (DMI) defined in document SFF-8636. The host can access real-time performance of transmitter and receiver optical power, temperature, supply voltage and bias current.

Performance Item	Related Bytes(A0[00] memory)	Monitor Error	Notes
Module temperature	22 to 23	+/-3°C	1, 2
Module voltage	26 to 27	< 3%	2
LD Bias current	42 to 49	< 10%	2
Transmitter optical power	50 to 57	< 3dB	2
Receiver optical power	34 to 41	< 3dB	2

Notes:

1. Actual temperature test point is fixed on module case around Laser.
2. Full operating temperature range

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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