

Description



MTRX-03X16-G is a high performance, cost effective modules, which is optimized for 10G SONET/SDH Ethernet and WAN applications, supporting data-rate of 10.3125Gbps (10GBASE-ER) or 9.953Gbps (10GBASE-EW), and transmission distance up to 40km.

The transceiver consists of two sections: The transmitter section incorporates a 1550nm cooled EML, driver and re-timer. The receiver section consists of a PIN photodiode integrated with a transimpedance preamplifier (TIA) and CDR. The module is hot pluggable into the 30-pin connector. The high-speed electrical interface is base on low voltage logic, with nominal 100 Ohms differential impedance and AC coupled in the module. The optical output can be disabled by LVTTTL logic high-level input of TX_DIS. Loss of signal (RX_LOS) output is provided to indicate the loss of an input optical signal of receiver.

A serial EEPROM in the transceiver allows the user to access transceiver monitoring and configuration data via the 2-wire XFP Management Interface. This interface uses a single address, A0h, with a memory map divided into a lower and upper area. Basic digital diagnostic (DD) data is held in the lower area while specific data is held in a series of tables in the high memory area.

Features

- Support 10GE application at the data-rate of 10.3125Gbps and 9.953Gbps
- Up to 40km transmission
- 1550nm cooled EML and PIN receiver
- XFI electrical interface
- 2-wire interface for integrated Digital Diagnostic monitoring
- XFP MSA package with duplex LC connector
- Hot pluggable
- Very low EMI and excellent ESD protection

- +3.3V & +5V power supply
- Power consumption less than 3.5 W
- Operating Case Temperature:0~+70°C

Application

- SONET(OC-192)/SDH(STM64) line card
- 10GBASE-ER at 10.3125Gbps
- 10GBASE-EW at 9.953Gbps
- Other optical links

Standard

- Compliant with XFP MSA
- Compliant with IEEE 802.3ae-2002
- RoHS compliance

Specification

Absolute Maximum Ratings				
Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T _s	-40	+85	°C
Supply Voltage #3	V _{CC3}	-0.5	3.6	V
Supply Voltage #5	V _{CC5}	-0.5	6.0	V
Relative Humidity	RH	-	+85	%
RX Input Average Power	P _{max}	-	5	dBm

Recommended Operating Conditions					
Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	T _c	0	-	+70	°C
Power Supply Voltage #3	V _{CC3}	3.13	3.3	3.45	V
Power Supply Current #3	I _{CC3}	-	-	750	mA
Power Supply Voltage #5	V _{CC5}	4.75	5	5.25	V
Power Supply Current #5	I _{CC5}	-	-	300	mA
Total Power Dissipation	P _D	-	-	3.5	W
Data Rate		9.95	-	11.3	Gbps
Transmission Distance		-	40	-	Km

Transmitter Operating Characteristic-Optical						
Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Centre Wavelength	λ_c	1530	1550	1565	nm	Note1
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Laser Off Power	P _{off}	-	-	-30	dBm	
Average Optical Power	P _{avg}	-3	-	3	dBm	Note1
Extinction Ratio	ER	8.2	9	-	dB	
Transmitter Dispersion Penalty	TDP	-2.1	-	-	dBm	
Relative Intensity Noise	R _{in}	-	-	-128	dB/Hz	
Operating Data Rate		9.95	-	11.3	Gbps	
Optical Eye Mask	Compliant with IEEE 802.3ae					Note2

Notes:

[1] Average optical power shall be measured using the methods specified in TIA/EIA-455-95.

[2] Vertical eye closure penalty and stressed eye jitter are the test conditions for measuring stressed receiver sensitivity. They are not the required characteristic of the receiver.

Receiver Operating Characteristic-Optical						
Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Center Wavelength	λ_r	1260	1310	1600	nm	
Receiver Sensitivity (Average Power)	P _{sens}	-	-	-15.8	dBm	Note1
Stressed Sensitivity (OMA)	-	-	-	-11.3	dBm	Note1
Los Assert	LosA	-25	-	-	dBm	
Los Dessert	LosD	-	-	-15	dBm	
Los Hysteresis	LosH	1	-	5	dB	
Overload	P _{in}	0.5	-	-	dBm	
Stressed Eye Jitter	-	0.3	-		Ulp-p	Note2
Receive electrical 3dB upper cutoff frequency	-	-	-	12.3	GHz	
Optical Path Penalty	PN	-	-	2	dB	
Optical Return Loss	ORL	26	-	-	dB	
Operating Data Rate	-	9.95	-	11.3	Gbps	

Notes:

[1] Receiver sensitivity is informative. Stressed receiver sensitivity shall be measured with conformance test signal for BER = 1×10^{-12} .

[2] Vertical eye closure penalty and stressed eye jitter are the test conditions for measuring stressed receiver sensitivity. They are not the required characteristic of the receiver.

Low Speed Control and Alarm Signals Electrical Interface					
Parameter	Symbol	Min	Max	Units	Note
XFP Interrupt, Mod_NR, RX_LOS	V _{ol}	0.0	0.4	V	Note1
	V _{oh}	V _{CC3} -0.5	V _{CC3} +0.3		Note2
XFP TX_DIS, P_DOWN/RST	V _{il}	-0.3	0.8	V	Note3
	V _{ih}	2.0	V _{CC3} +0.3		Note4
XFP SCL and SDA Output	V _{ol}	0.0	0.4	V	Note1
	V _{oh}	V _{CC3} -0.5	V _{CC3} +0.3		Note2
XFP SCL and SDA Input	V _{il}	-0.3	V _{CC3} *0.3	V	Note5
	V _{ih}	V _{CC3} *0.7	V _{CC3} +0.5		Note6
Capacitance for XFP SCL and SDA I/O pin	C _i	-	14	pF	
Total bus capacitive load for SCL and SDA	C _b	-	100	pF	Note7
		-	400	pF	Note8

Notes:

[1] Pull-up resistor must be connected to host_Vcc on the host board. I_{ol}(max)=3mA

[2] Pull-up resistor must be connected to host_Vcc on the host board.

[3] Pull-up resistor connected to VCC3 within XFP module. I_{il}(max)= -10μA.

[4] Pull-up resistor connected to VCC3 within XFP module. I_{ih}(max)= 10μA.

[5] Pull-up resistor must be connected to host_Vcc on the host board. I_{ol}(max)= -10μA.

[6] Pull-up resistor must be connected to host_Vcc on the host board. I_{ol}(max)= 10μA.

[7] At 400KHz, 3.0kohms, at 100kHz 8.0kohms max.

[8] At 400KHz, 0.8kohms, at 100kHz 2.0kohms max.