

Description

MTRS-02X13-G is a high performance, cost effective modules, which is supporting Multi Rate 2.5-10.3125Gbps, and transmission distance up to 10km on SM fiber. The transceiver consists of two sections: The transmitter section incorporates a 1310nm DFB driver. The receiver section consists of a PIN photodiode integrated with a transimpedance preamplifier (TIA). The module is hot pluggable into the 20-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. Transmit Fault (Tx_Fault) is provided to indicate that the module transmitter has detected a fault condition related to laser operation or safety. 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 SFP 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

- Up to 10km transmission distance
- Support Multi Rate 2.5-10.3125Gbps
- 1310nm DFB and PIN receiver
- SFI electrical interface
- 2-wire interface for integrated Digital Diagnostic monitoring
- SFP MSA package with duplex LC connector
- Hot pluggable
- Very low EMI and excellent ESD protection
- +3.3V power supply
- Power consumption less than 1W
- Operating case temperature: 0~+70°C

Applications

- High-speed storage area networks
- Computer cluster cross-connect
- Custom high-speed data pipes

- LTE optical repeater application

Compliance

- Compliant with IEEE 802.3ae-2002
- Compliant with MSA SFF-8472
- Compliant with MSA SFF-8431

Specification

Absolute Maximum Ratings					
Parameter	Symbol	Min.	Max.	Unit	
Storage Temperature	T_s	-40	+85	°C	
Supply Voltage	V_{CC3}	0	3.6	V	
Relative Humidity	RH	5	+95	%	
RX Input Average Power	P_{max}	-	+3	dBm	
Recommended Operating Conditions					
Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	T_c	0	25	+70	°C
Power Supply Voltage	V_{CC3}	3.13	3.3	3.47	V
	I_{CC3}	-	-	300	mA
Power Dissipation	P_D	-	-	1	W
Data Rate		2.5		10.3125	Gbps
Transmission Distance		-	-	10	Km

Transmitter Operating Characteristic-Optical, Electrical						
Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Center Wavelength	λ_c	1260	1310	1355	nm	Note1
Spectral Width (-20dB)	P_m	-	-	1	nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dBm	

Laser Off Power	Poff	-	-	-30	dBm	
Average Optical Power	Pavg	-8.2	-	0.5	dBm	Note1
Extinction Ratio	ER	3.5	-	-	dB	
Transmitter Dispersion Penalty	TDP	-	-	3.2	dB	
Relative Intensity Noise	Rin	-	-	-128	dB/Hz	
Optical Return Loss Tolerance		12	-	-	dB	
Operating Data Rate		2.5		10.3125	Gbps	
Optical Eye Mask	Compliant with IEEE 802.3ae					
Tx Input Diff. Voltage	VI	180	-	700	mV	
Tx Fault	VoL		-	0.4	V	
	VoH	2.4		Vcc	V	
Tx Optical Power in OMA		-5.2			dBm	

Notes:

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

Receiver Operating Characteristic-Optical, Electrical						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Center Wavelength	λ_r	1260	1310	1355	nm	
Receiver Sensitivity	Psens	-	-	-14.4	dBm	Note1
Stressed Sensitivity (OMA)		-	-	-12.6	dBm	
Los Assert	LosA	-30	-	-	dBm	
Los Dessert	LosD	-	-	-15	dBm	
Los Hysteresis	LosH		2	-	dB	
Overload	Pin	0.5	-	-	dBm	
Receiver Reflectance		-	-	-12	dB	
Operating Data Rate		2.5		10.3125	Gbps	
Rx Output Diff Voltage	Vo		-	850	mV	
Rx Output Rise and Fall Time	Tr/Tf		34	-	ps	20% to 80%

Notes:

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

Control and Status I/O Timing Characteristics					
Parameter	Symbol	Min.	Max.	Unit	Note
TX Disable Assert Time	t_off	-	100	µs	Note1
TX Disable Negate Time	t_on	-	2	ms	Note2
Time to initialize including reset of TX_Fault	t_init	-	300	ms	Note3
TX Fault Assert Time	t_fault_on	-	1	ms	Note4
TX Fault Reset Time	t_reset	10	-	µs	Note5
LOS Assert Time	t_loss_on	-	100	µs	Note6
LOS Deassert Time	t_loss_off	-	100	µs	Note7
Serial ID Clock Rate	f_serial_clock	-	100	kHz	
TX Disable Assert Time	t_off	-	100	µs	Note1

Notes:

[1] Time from rising edge of TX Disable to when the optical output falls below 10% of nominal

[2] Time from falling edge of TX Disable to when the modulated optical output rises above 90% of nominal

[3] From power on or negation of TX Fault using TX Disable

[4] Time from fault to TX fault on

[5] Time from TX fault to TX nominal

[6] Time from LOS state to RX LOS assert

[7] Time from non-LOS state to RX LOS deassert.