

Description

MTRS-1E21-01 is a high performance, cost effective modules, which is supporting Multi Rate 4.9152.Gbps to 10.3125Gbps, and transmission distance up to 1.4km on SM fiber. The transceiver consists of two sections: The transmitter section incorporates a laser driver and a 1310nm FP laser. The receiver section consists of a PIN photodiode integrated with a transimpedance preamplifier (TIA) and a Limiting Amplifier. The module is hot pluggable into the 20-pin connector. The high-speed electrical interface is base on low voltage logic, with nominal 100Ohms 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 1.4km transmission on SMF
- Support Multi Rate 4.9152Gbps to 10.3125Gbps
- 1310nm FP laser 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 1.0W
- Operating case temperature: -40~+85°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	+85	%
Rx Input Average Power	P_{max}	-	+1.5	dBm

Recommended Operating Conditions					
Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	T_c	-40	25	+85	°C
Power Supply Voltage	V_{CC3}	3.13	3.3	3.47	V
	I_{CC3}	-	-	300	mA
Power Dissipation	P_D	-	-	1.0	W
Data Rate		4.9152	9.8304	10.3125	Gbps
Transmission Distance		-	-	1.4	Km

Transmitter Operating Characteristic-Optical, Electrical						
Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Centre Wavelength	λ_c	1260	1310	1360	nm	
Laser Off Power	P_{off}	-	-	-30	dBm	
Average Optical Power	P_{avg}	-8.2	-	0.5	dBm	Note 1

Extinction Ratio	ER	3.5	-	-	dB	
Transmitter Dispersion Penalty	TDP	-	-	3.2	dB	
Relative Intensity Noise	RIN ₁₂ OMA	-	-	-128	dB/Hz	
Optical Return Loss Tolerance	ORLT	12	-	-	dB	
Operating Data Rate		4.9152	-	10.3125	Gbps	
Optical Eye Mask	Compliant with IEEE 802.3ae-2002					
Tx Input Diff. Voltage	VI	180	-	700	mV	

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	1360	nm	
Receive Sensitivity In Average Power	Psen	-	-	-14.4	dBm	
Receiver Sensitivity In OMA		-	-	-12.6	dBm	Note1
Stressed Receiver Sensitivity In OMA		-	-	-10.3	dBm	Note1
Los Assert	LosA	-30	-	-	dBm	
Los Dessert	LosD	-	-	-17	dBm	
Los Hysteresis	LosH	0.5	-	-	dB	
Overload	Pin		-	0.5	dBm	
Receiver Reflectance		-	-	-12	dB	
Operating Data Rate	4.9152	-	-	10.3125	Gbps	
Rx Output Diff Voltage	Vo	450	-	850	mV	

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

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.