10G SFP+ Transceiver

MTRS-01X11-G

Features

- Operating data rate 10.3125Gbps
- SFP+ MSA package with duplex LC connector
- Duplex LC connector
- Single +3.3V power supply
- Differential LVPECL inputs and outputs
- Hot-pluggable capability
- RoHS compliant

Applications

- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Compliance

- SFP MSA
- SFF-8472
- IEEE802.3z
- RoHS

Description

MTRS-01X11-G is a high performance, cost effective modules, which is optimized for 10.3125G Ethernet application, and transmission distance up to 300m on OM3 MMF,

The transceiver consists of two sections: The transmitter section incorporates an 850nm VCSEL 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 based on low voltage logic, with nominal 100 Ohms differential impedance and AC coupled in the module. The optical output can be disabled by LVTTL 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 SFP Management Interface. This interface uses two single addresses: A0h and A2h. 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.

.

Absolute Maximum Ratings

Table1-Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T_S	-40	+85	°C
Supply Voltage	V_{CC}	0	3.6	V
Relative Humidity	RH	5	85	%

Recommended Operating Conditions

Table2-Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Operating Case Temperature	T_C	0		70	°C	
Power Supply Voltage	V_{CC}	3.135	3.3	3.475	V	
	I_{CC}			280	mA	
Power Dissipation	P_D			1000	mW	
Data Rate			10.3125		Gbps	
Transmission Distance				300	m	OM3

Optical，Electrical Characteristic

MTRS-01X11-G (850nm Vcsel and PIN, 0.3Km)

Tested under recommended operating conditions, unless otherwise noted

Table3-Transmitter Operating Characteristic-Optical，Electrical

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Center Wavelength	λ_C	840	850	860	nm	
RMS Spectral Width				0.45	nm	
Optical Power for TX DISABLE	Poff			-30	dBm	
Output average power	Pavg	-7.3		-1	dBm	
Optical Modulation Amplitude	OMA		-1.5		dBm	
Extinction Ratio	ER	3			dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Optical Return Loss Tolerance				12	dB	
Transmitter Dispersion Penalty	TDP			3.9	dB	
Optical Eye Mask	Compliant with IEEE 802.3ae					
Tx Input Diff Voltage	VI	180		700	mV	
Tx Fault	V_{OL}	-0.3		0.4	V	At 0.7mA
	I_{OH}	-50		37.5	uA	Note1
Tx_Disable	V_{IL}	-0.3		0.8	V	
	V_{IH}	2		VCC+0.3	V	

Notes:

[1] Measured with a 4.7 kΩ load pulled up to Vcc.

Table4-Receiver Operating Characteristic-Optical，Electrical

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Center Wavelength	λ_r	840	850	860	nm	
Average receive power				-9.9	dBm	Note1
Receiver Sensitivity(OMA)	Psens			-11.1	dBm	Note1
Los Assert	LosA	-30			dBm	
Los Dessert	LosD			-11	dBm	
Los Hysteresis	LosH	0.5			dB	
Overload	Pin	-1			dBm	
Receiver Reflectance				-12	dB	
Operating Data Rate			10.3125		Gbps	
Rx Output Diff Voltage	Vo	300		850	mV	
Rx_LOS	VoL	-0.3		0.4	V	At 0.7mA
	IoH	-50		37.5	uA	Note2
RS0 and RS1	VIL	-0.3		0.8	V	
	VIH	2		VCC+0.3	V	

Notes:

[1] Receiver sensitivity is informative. shall be measured with conformance test signal for BER =1x10^{-12}.

[2] Measured with a 4.7 kΩ load pulled up to Vcc.

Pin-out Definition

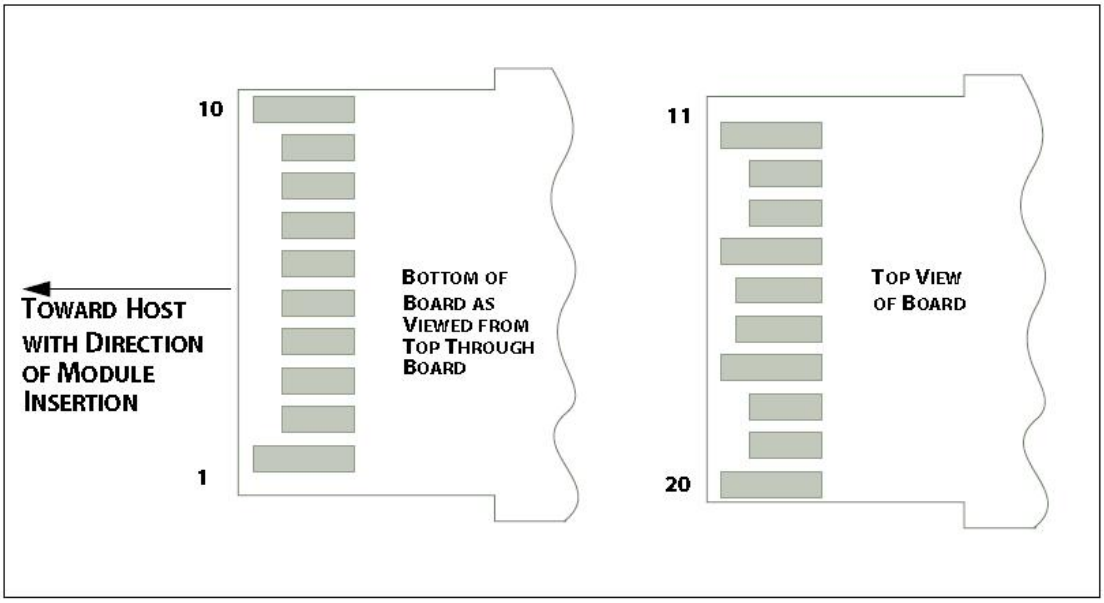

Figure 1

Table5-Pin Function Definitions

Pin	Logic	Symbol	Name/Description	Note
1		VeeT	Module Transmitter Ground	Note1
2	LVTTL-O	TX_Fault	Module Transmitter Fault	Note2
3	LVTTL-I	TX_Disable	Transmitter Disable; Turns off transmitter laser output	Note3
4	LVTTL-I/O	SDA	2-wire Serial Interface Data Line (Same as MOD-DEF2 as defined in the INF-8074i)	Note4
5	LVTTL-I/O	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 as defined in the INF-8074i)	Note4
6		MOD_ABS	Module Absent, connected to VeeT or VeeR in the module	Note5
7	LVTTL-I	RS0	Adaptive multi-rate operation	Note6
8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication (In FC designated as RX_LOS, in SONET designated as LOS, and in Ethernet designated at Signal Detect)	Note2
9	LVTTL-I	RS1	Adaptive multi-rate operation	Note6
10		VeeR	Module Receiver Ground	Note1
11		VeeR	Module Receiver Ground	Note1
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	RD+	Receiver Non-Inverted Data Output	
14		VeeR	Module Receiver Ground	Note1
15		VccR	Module Receiver 3.3 V Supply	
16		VccT	Module Transmitter 3.3 V Supply	
17		VeeT	Module Transmitter Ground	Note1
18	CML-I	TD+	Transmitter Non-Inverted Data Input	

19	CML-I	TD-	Transmitter Inverted Data Input	
20		VeeT	Module Transmitter Ground	Note1

Notes:

[1] The module signal ground pins, VeeR and VeeT, shall be isolated from the module case.

[2] This pin is an open collector/drain output pin and shall be pulled up with 4.7kΩ-10kΩ to Host_Vcc on the host board. Pull ups can be connected to multiple power supplies, however the host board design shall ensure that no module pin has voltage exceeding module VccT/R + 0.5V.

[3] This pin is an open collector/drain input pin and shall be pulled up with 4.7kΩ-10kΩ to VccT in themodule.

[4] See SFF-8431 4.2 2-wire Electrical Specifications.

[5] This pin shall be pulled up with 4.7kΩ-10kΩ to Host_Vcc on the host board.

[6] Connect with 30kΩ load pulled down to GND in themodule.

Block Diagram of Transceiver

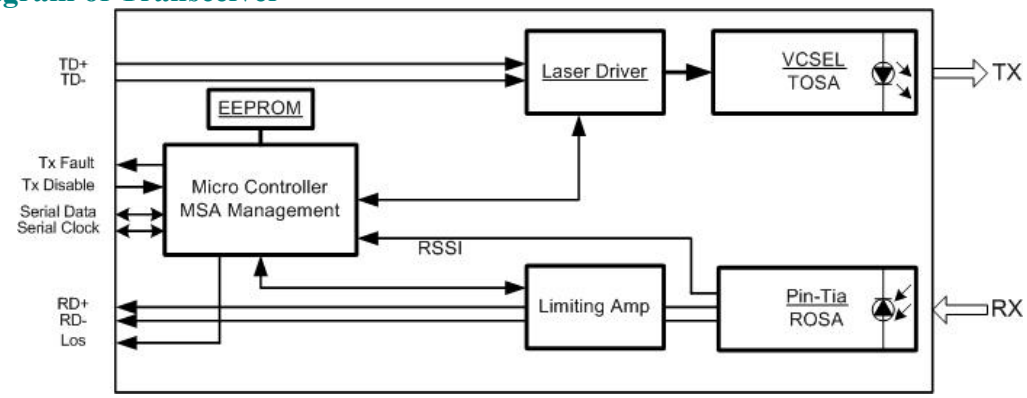

Figure 2

<Transmitter Section>:

The transmitter converts 10Gbit/s serial PECL or CML electrical data into serial optical data compliant with the 10GBASE-SR standard. An open collector compatible Transmit Disable (Tx_Dis) is provided. A logic "1," or no connection on this pin will disable the laser from transmitting. A logic "0" on this pin provides normal operation. The transmitter has an internal automatic power control loop (APC) to ensure constant optical power output across supply voltage and temperature variations. An open collector compatible Transmit Fault (Tx_Fault) is provided. TX_Fault is a module output contact that when high level indicates that the module transmitter has detected a fault condition related to laser operation or safety. The TX_Fault output contact is an open drain/collector and shall be pulled up to the Vcc_Host in the host with a resistor in the range 4.7kΩ-10kΩ.

<Receiver Section>:

The receiver converts 10Gbit/s serial optical data into serial PECL/CML electrical data. An open collector compatible Loss of Signal is provided. Rx_LOS when high indicates an optical signal level below that specified in the relevant standard. The Rx_LOS contact is an open drain/collector output and shall be pulled up to Vcc_Host in the host with a resistor in the range 4.7kΩ-10kΩ, or with an active termination. Power supply filtering is recommended for both the transmitter and receiver.

Recommended Interface Circuit

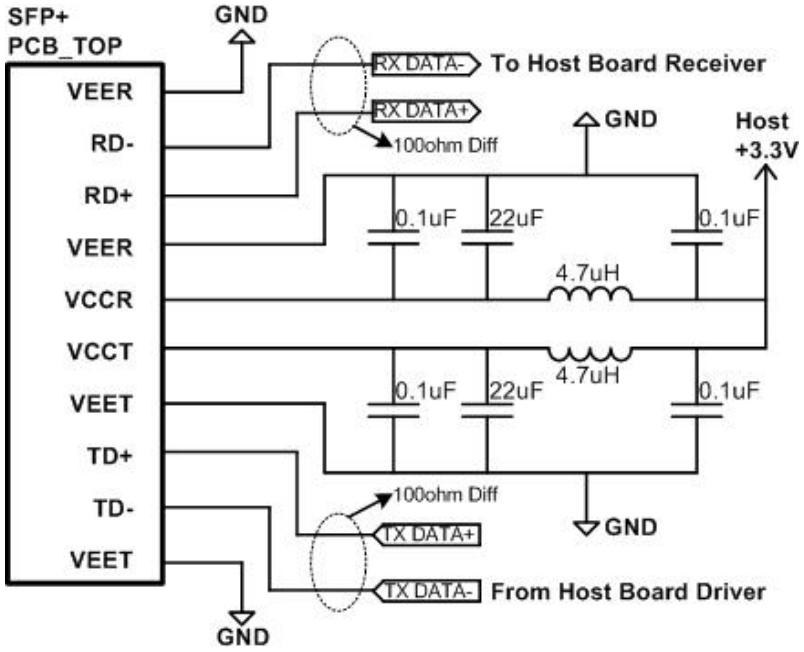

Figure 3

Dimensions

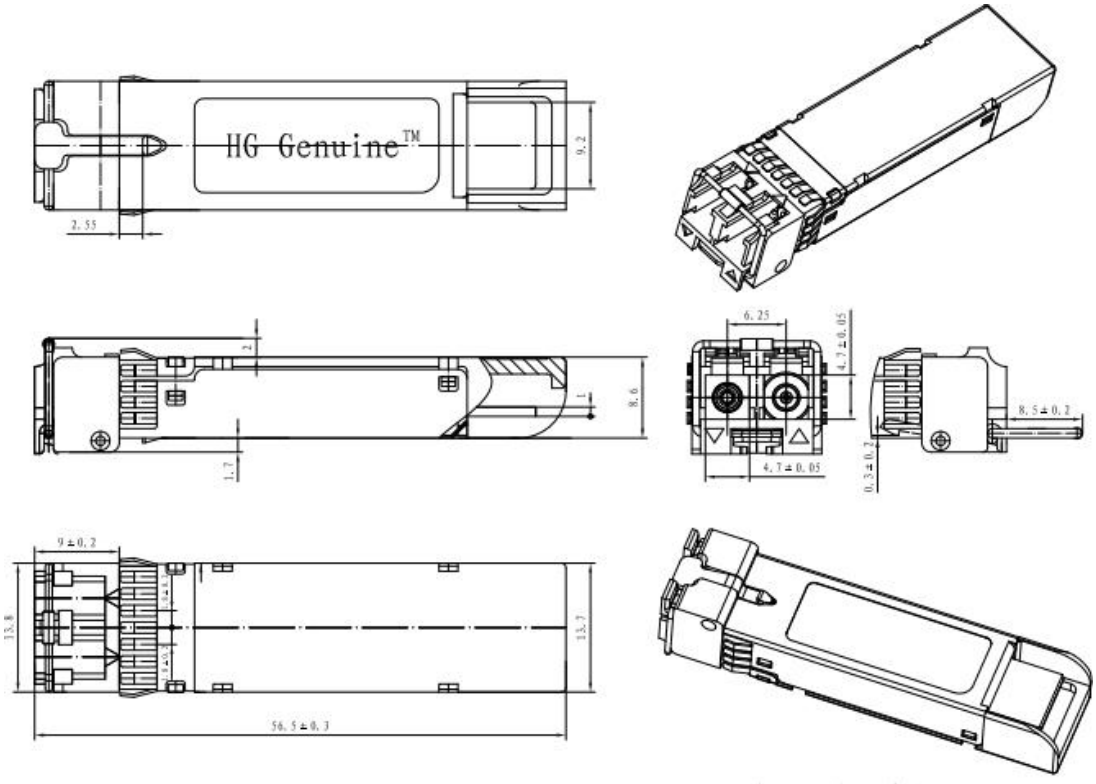

Figure 4

Ordering Information

Table6- Ordering Information

Part No	Specification								
	Pack	Rate	Tx	Pout	Rx	Psens	Top	Reach	Others
MTRS-01X11-G	SFP+	10.3125Gbps	850nm VCSEL	-7.3~-1dBm	PIN	<-11.1dBm	0~70℃	300m	DDM/RoHS

Contact Information

Wuhan Huagong Genuine Optics Technology Co., Ltd

Address: Science & Technology Region of HUST, Donghu High-Tech Zone Wuhan, Hubei Province, 430223, China

- **Tel: +86-27-87180102**
- **Fax: +86-27-87180220**

Email: market@genuine-opto.com Website: http://www.genuine-opto.com

Statement

HG Genuine possesses the authority for ultimate explanation of all information contained in this document, which is subject to change without prior notice. All the information was obtained in specific environments; and HG Genuine will not be responsible for verifying the products performance in customers' operating environments, neither liable for the performance of users' products. All information contained is only for the users' reference and shall not be considered as warranted characteristics. HG Genuine will not be liable for damages arising directly or indirectly from any use of the information contained in this document.

Publishing Date: 2019-3-18