10GBASE-T Copper SFP+ Transceiver

GLSF-T96-02(I)

■ Features:

➢ Support 10Gbase-T / 5Gbase-T / 2.5Gbase-T / 1000base-T

➢ Hot-pluggable SFP footprint

➢ Compact RJ-45 connector assembly

➢ RoHS compliant and lead-free

➢ Single +3.3V power supply

➢ 10 Gigabit Ethernet over Cat 6a cable

➢ Ambient Operating temperature: 0°C to +65°C

■ Description:

GLSF-T96-02(I) Small Form Pluggable (SFP) transceivers are based on the SFP Multi Source Agreement (MSA) . They are compatible with the 10Gbase-T / 5Gbase-T / 2.5Gbase-T / 1000base-T standards as specified in IEEE Std 802.3 . GLSF-T10-xx uses the SFP's RX_LOS(must be pulled up on host) pin for link indication. If pull up or open SFP's TX_DISABLE pin,　PHY IC be reset.

3. Performance Specifications

3.1. 3.3V Volt Electrical Power Interface

The NM-280-RJ45 has an input voltage range of 3.3 V +/- 5%. The 4V maximum voltage is not allowed for continuous operation.

Table.1 3.3V Volt Electrical Power Interface

Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
Supply Current	Is		320	375	mA	1.2W max power over full range of voltage and temperature. See caution note below
Input Voltage	Vcc	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	Vmax			4	V	
Surge Current	Isurge			30	mA	Hot plug above steady state current. See caution note below

Caution: Power consumption and surge current are higher than the specified values in the SFP

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3.2. Low-Speed Signals

MOD_DEF(1) (SCL) and MOD_DEF(2) (SDA), are open drain CMOS signals (see section VII, "Serial Communication Protocol"). Both MOD_DEF(1) and MOD_DEF(2) must be pulled up to host_Vcc

Table.2 Low-Speed Signals, Electronic Characteristics

Parameter	Symbol	Min	Max	unit	Notes/Conditions
SFP Output LOW	VOL	0	0.5	V	4.7k to 10k pull-up to host_Vcc,measured at host side of connector
SFP Output HIGH	VOH	host_Vcc -0.5	host_Vcc + 0.3	V	4.7k to 10k pull-up to host_Vcc,measured at host side of connector
SFP Input LOW	VIL	0	0.8	V	4.7k to 10k pull-up to Vcc,measured at SFP side of connector
SFP Input HIGH	VIH	2	Vcc + 0.3	V	4.7k to 10k pull-up to Vcc,measured at SFP side of connector

3.3. High-Speed Electrical Interface

All high-speed signals are AC-coupled internally.

Table.3 High-Speed Electrical Interface, Transmission Line-SFP

Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
Line Frequency	fL		125		MHz	5-level encoding, per IEEE 802.3
Tx Output Impedance	Zout,TX		100		Ohm	Differential, for all frequencies between 1MHz and 125MHz
Rx Input Impedance	Zin,RX		100		Ohm	Differential, for all frequencies between 1MHz and 125MHz

Table.4 High-Speed Electrical Interface, Host-SFP

Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
Single ended data input swing	Vinsing	250		1200	mV	Single ended
Single ended data output swing	Voutsing	350		800	mV	Single ended
Rise/Fall Time	Tr,Tf		175		psec	20%-80%
Tx Input Impedance	Zin		50		Ohm	Single ended
Rx Output Impedance	Zout		50		Ohm	Single ended

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3.4. General Specifications

Table.5 General

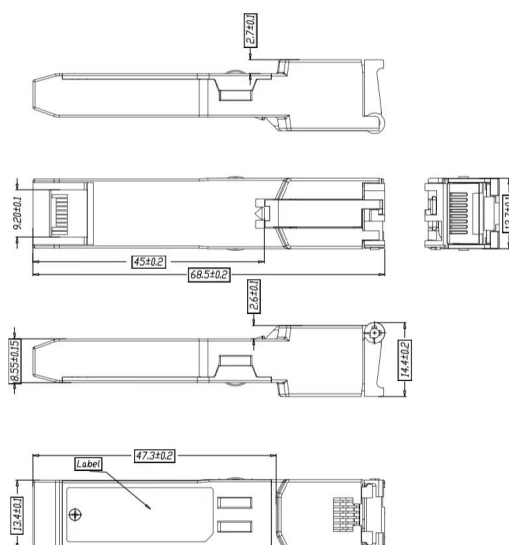| Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
Data Rate	BR	1		10	Gb/sec	IEEE 802.3 compatible.See Notes 2 through 4 below
Cable Length	L			30	m	Category 5 UTP. BER

Notes:

1. Clock tolerance is +/- 50 ppm

2. By default, the ECFY-SFP-T12-02-2 is a full duplex device in preferred master mode

3. Automatic crossover detection is enabled.   External crossover cable is not required

4. 10/100/1000 BASE-T operation requires the host system to have an SGMII interface with no clocks.

3.5. Environmental Specifications

Table.6 Environmental Specifications

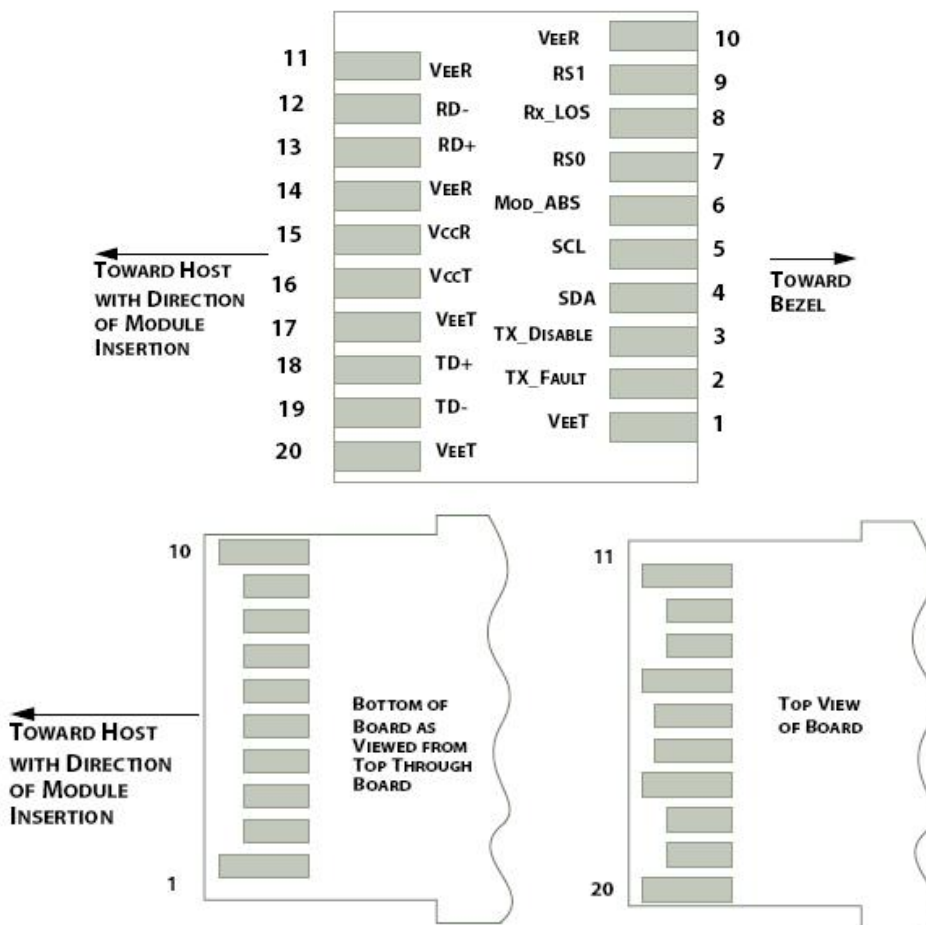| Parameter	Symbol	Min	Typ	Max	unit
Case Operating Temperature	Tcase	0		65	°C
		-10		80	°C
		-40		85	°C
Storage Temperature	Tsto	-40		85	°C

3.6. Mechanical Specifications (Unit:mm)

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3.7. Pin Definitions

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Table.8 Pin Definitions

PIN	Symbol	Description	Remarks
1	$V_{EE}T$	Transmitter ground (common with receiver ground)	Circuit ground is isolated from chassis ground
2	Tx_Fault	Transmitter Fault. Not supported	
3	Tx_Disable	Transmitter Disable. Laser output disable on high or open	Disabled: TDIS>2V or open Enabled: TDIS<0.8V
4	SDA	2-wire Serial Interface Data Line	Should Be pulled up with 4.7k – 10k ohm on host board to a voltage between 2V and 3.6V
5	SCL	2-wire Serial Interface Clock Line	
6	M_{OD}_ABS	Module Absent. Grounded within the module.	
7	RS0	No connection required	
8	RX_LOS	Loss of Signal indication. Logic 0 indicates normal operation	LOS is open collector output
9	RS1	No connection required	
10	$V_{EE}R$	Receiver ground (common with transmitter ground)	Circuit ground is isolated from chassis ground
11	$V_{EE}R$	Receiver ground (common with transmitter ground)	
12	RD–	Receiver Inverted DATA out. AC coupled	
13	RD+	Receiver Non-inverted DATA out. AC coupled	
14	$V_{EE}R$	Receiver ground (common with transmitter ground)	Circuit ground is isolated from chassis ground
15	$V_{CC}R$	Receiver power supply	
16	$V_{CC}T$	Transmitter power supply	
17	$V_{EE}T$	Transmitter ground (common with receiver ground)	Circuit ground is isolated from chassis ground
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	
19	TD–	Transmitter Inverted DATA in. AC coupled	
20	$V_{EE}T$	Transmitter ground (common with receiver ground)	Circuit ground is isolated from chassis ground

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