SFP+ Copper 10GBase-T

SL-SFP-10G-T

Overview

SFP+ 10G copper transceiver module is a high performance integrated duplex data link for bi-directional communication over copper cable. It is specifically designed for high speed communication links that require 10 Gigabit Ethernet over Cat 6a/7 cable. This is the first SFP+ transceiver that offers 10 Gb/s communication over this type of media.

Features

♦ Supports Links up to 30m using Cat 6a/7 Cable
♦ SFF-8431 and SFF-8432 MSA Compliant
♦ IEEE 802.3az Compliant
♦ Low Power Consumption (2.5W MAX @ 30m)
♦ Fast Retrain EMI Cancellation Algorithm
♦ Low EMI Emissions
♦ I2C 2-Wire Interface for Serial ID and PHY Register Access
♦ Auto-negotiates with other 10GBase-T PHYs
♦ Supports 100/1000Base-T using Cat 5e cable or better
♦ MDI/MDIX Crossover
♦ Multiple Loopback Modes for Testing and Troubleshooting
♦ Built-in Cable Monitoring and Link Diagnostic Features
♦ Cable Length Measurements
♦ Robust Die Cast Housing
♦ Bail Latch Style ejector mechanism
♦ Unshielded and Shielded cable support
♦ Operating case temperature range of -20°C to +85°C

Applications

♦ 10GBASE 10GBase Ethernet over Cat 6a/7 cable

Ordering Information

Part Number	Description
SL-SFP-10G-T	SFP+ Copper 10GBase-T 30M Cat 6a/7 Cable

Pin Definitions
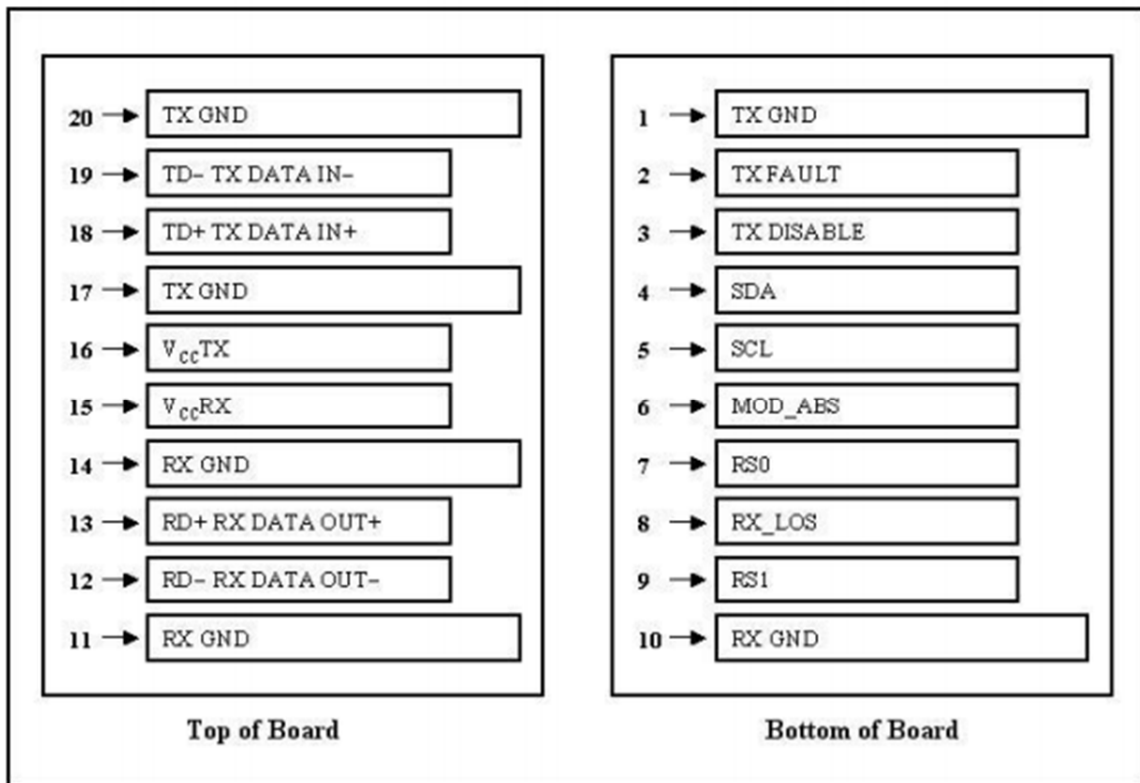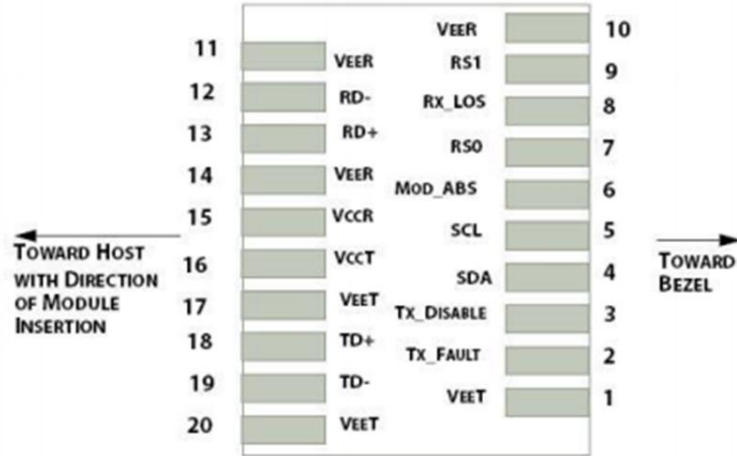
Figure1. Pin Diagram

Pin Descriptions

Pin	Signal Name	Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note1
3	TX DISABLE	Transmitter Disable	3	Note2
4	MOD_DEF(2)	SDA Serial Data Signal	3	Note3
5	MOD_DEF(1)	SCL Serial Clock Signal	3	Note3
6	MOD_DEF(0)	TTL Low	3	Note3
7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	Note4
9	V_{EER}	Receiver ground	1	
10	V_{EER}	Receiver ground	1	
11	V_{EER}	Receiver ground	1	
12	RX-	Inv. Received Data Out	3	Note 5
13	RX+	Received Data Out	3	Note 5
14	V_{EER}	Receiver ground	1	
15	V_{CCR}	Receiver Power Supply	2	
16	V_{CCT}	Transmitter Power Supply	2	
17	V_{EET}	Transmitter Ground	1	
18	TX+	Transmit Data In	3	Note 6
19	TX-	Inv. Transmit Data In	3	Note 6
20	V_{EET}	Transmitter Ground	1	

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

1) TX Fault is not supported and is always connected to ground.
2) TX disable, an input used to reset the transceiver module, This pin is pulled up within the module with a 4.7 KΩ resistor.

   Low (0 – 0.8 V)   : Transceiver on
   Between (0.8 V and 2.0 V)   : Undefined
   High (2.0 – 3.465 V)   : Transceiver in reset state
   Open   : Transceiver in reset state

3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K~10K resistor on the host board. The pull-up voltage shall be VccT or VccR

   Mod-Def 0 is grounded by the module to indicate that the module is present

   Mod-Def 1 is the clock line of two wire serial interface for serial ID

   Mod-Def 2 is the data line of two wire serial interface for serial ID

4) RX_LOS (Loss of Signal): LVTTL compatible with a maximum voltage of Host_Vcc. RX_LOS can enabled or disabled (Refer to Ordering information),RX_LOS is not used and is always tied to ground via 100-ohm resistor.
5) RD-/+: These are the differential receiver outputs. They are AC coupled 100 differential lines which should be terminated with 100 (differential) at the user SERDES.
6) TD-/+: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 differential terminations inside the module.

General Specifications

General						
Parameter	Symbol	Min	Typical	Max	Units	Notes/Conditions
Cable Length	L			30	m	BER < 10^{-12}
Operating Humidity		5		95	%	Non condensing
Power @30m	Is		2.3	2.5	W	
Input Voltage	Vcc	3	3.3	3.6	V	

Environmental Specifications

Parameter		Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Extend	Tc	-20		+85	°C
Storage Temperature			-40		+85	°C

Mechanical Specifications

NOTES:
1) MAIN BODY OF HOUSING MATERIAL: ZINC DIE CAST WITH NICKEL PLATING
2) GROUNDING TABS: STAMPED BRASS WITH NICKEL PLATING
3) RJ45 INSULATOR MATERIAL: STANYL TE250F6-RATED 94V-0; COLOR: BLACK
4) RJ45 CONTACTS: PHOSPHOR BRONZE
   PLATING 50µin. MIN. HARD GOLD ON CONTACT AREA, TIN ON SOLDER AREA
5) BAIL LATCH: M3M STEEL WITH GOLD FLASH OVER NICKEL PLATING
6) EJECTOR ACTUATOR: ZINC DIE CAST WITH NICKEL PLATING
7) PCB-.039" THICK) 30µin. MIN GOLD PLATING OVER 50µin. MIN NICKEL ON CONTACT AREA
8) SHIELDED PLUG GROUNDING TAB: BERYLLIUM COPPER WITH NICKEL PLATING
9) SCREW: STAINLESS STEEL

Figure2. Mechanical Specifications

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Datasheet

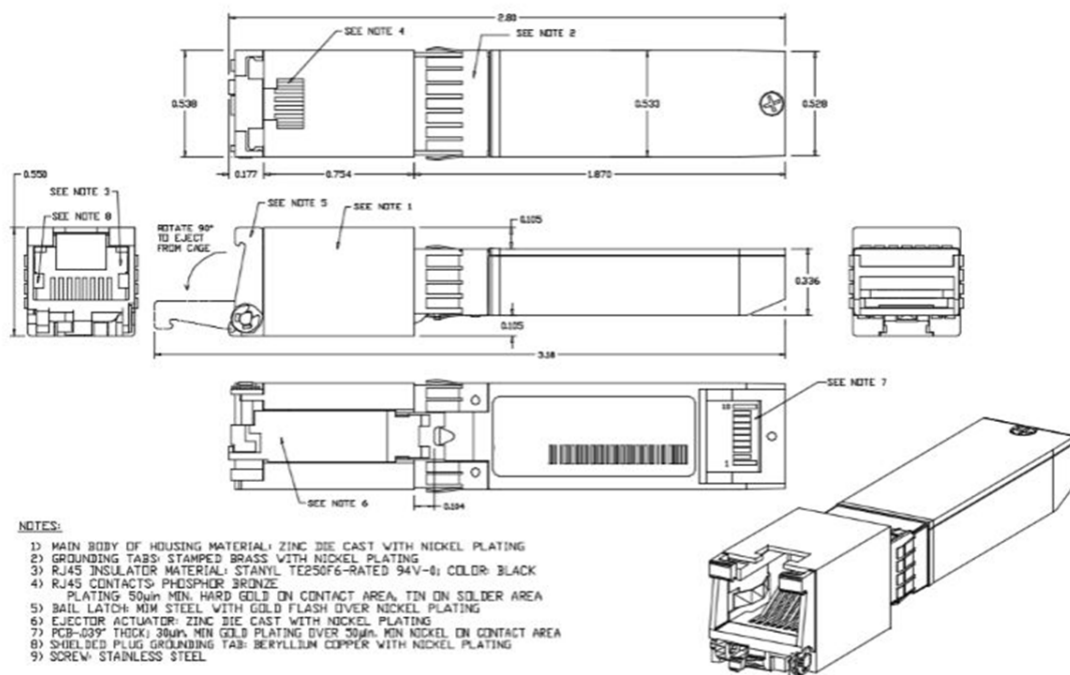## References

1. IEEE standard 802.3ae. IEEE Standard Department, 2005.

2. Enhanced 8.5 and 10 Gigabit Small Form Factor Pluggable Module "SFP+" – SFF-8431

3. Digital Diagnostics Monitoring Interface for Optical Transceivers – SFF-8472.