

1000BASE-T Copper 100m SFP Optical Transceiver Module

S-SP1GR01-C

Features

- Support 1.0Gb/s two-way data transmission link
- Hot-pluggable SFP footprint
- TX Disable and RX Los/without Los function
- Fully metallic enclosure for low EMI
- +3.3V DC single power supply
- Low power dissipation (1.05 W typical)
- Compact RJ-45 connector assembly
- Access to physical layer IC via 2-wire serial bus
- 1000 BASE-T operation in host systems with SERDES interface
- Operating case temperature range of 0°C to +70°C
- RoHS compliant (lead free)

Applications

- 1.0Gigabit Ethernet over Cat 5 cable

Description

1000BASE-T SFP Copper transceivers is high performance, cost effective module compliant with the Gigabit Ethernet and 1000BASE-T standards as specified in IEEE 802. 3-2002 and IEEE 802.3ab, which supporting 1000Mbps data-rate up to 100 meters reach over unshielded twisted-pair category 5 cable (BER <10⁻¹²) . The module supports 1000 Mbps full duplex data-links with 5-level Pulse Amplitude Modulation (PAM) signals. The module provides standard serial ID information compliant with SFP MSA, which can be accessed with address of A0h via the 2wire serial CMOS EEPROM protocol. The physical IC can also be accessed via 2wire serial bus at address ACh.

Environmental specification

Parameter	Symbol	Min	Typ	Max	Units
Operating Temperature	Tc	0		+70	°C
Storage Temperature		-40		+85	°C

+3.3V Electrical Power Interface

Parameter	symbolo	Min	Typ	Max	Units	Notes/Conditions
Supply Current	Is		320	375	mA	The maximum power meter is 1.2w for the whole voltage and temperature range
Input Voltage	Vcc	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	Vmax			3.6	V	

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Low-speed signals, electronic characteristics

Parameter	Symbol	Min	Max	Units	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

High-speed electrical interface, transmission line-SFP

Parameter	Symbol	Min	Typ	Max	Units	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

High-speed electrical interface, host-SFP

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

General specifications

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Data Rate	BR	10		1000	Mb/sec	IEEE802.3compatible

Notes

1. Clock tolerance is +/- 50 ppm.

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Pin Definitions

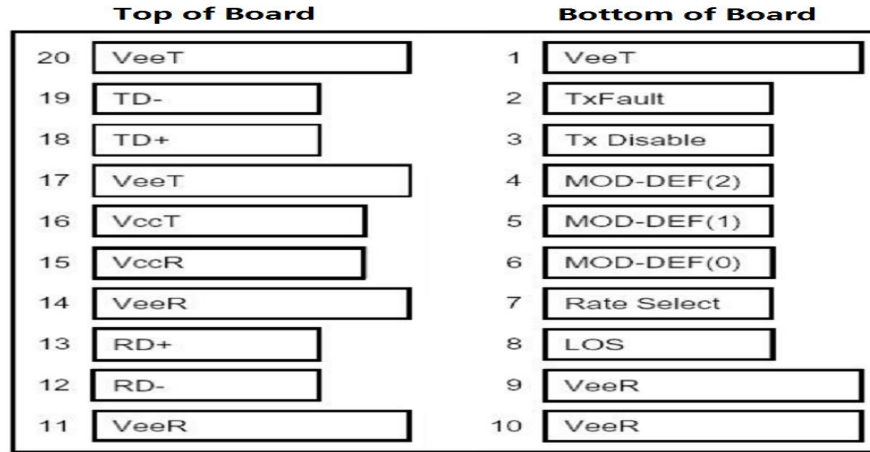


Figure 1. Pin definitions

Pin	Signal Name	Description	Note	Plug seq.
1	VeeT	Transmitter Ground		
2	TX Fault	Transmitter Fault Indication	Note1	1
3	TX Disable	Transmitter Disable	Note2	2
4	MOD_DEF(2)	Transmitter Disable	Note3	3
5	MOD_DEF(1)	SCL Serial Clock Signal	Note3	3
6	MOD_DEF(0)	TTL Low	Note3	3
7	Rate Select	Not Connected		3
8	LOS	Loss of Signal	Note4	3
9	VeeR	Loss of Signal		1
10	VeeR	Loss of Signal		1
11	VeeR	Loss of Signal		1
12	RX-	Inv. Received Data Out	Note5	3
13	RX+	Received Data Out	Note5	3
14	VeeR	Receiver ground		1
15	VccR	Receiver Power Supply		2
16	VccT	Transmitter Power Supply		2
17	VeeT	Transmitter Ground		1
18	TX+	Transmit Data In	Note6	3
19	TX-	Inv. Transmit Data In	Note6	3
20	VeeT	Transmitter Ground		1

Notes

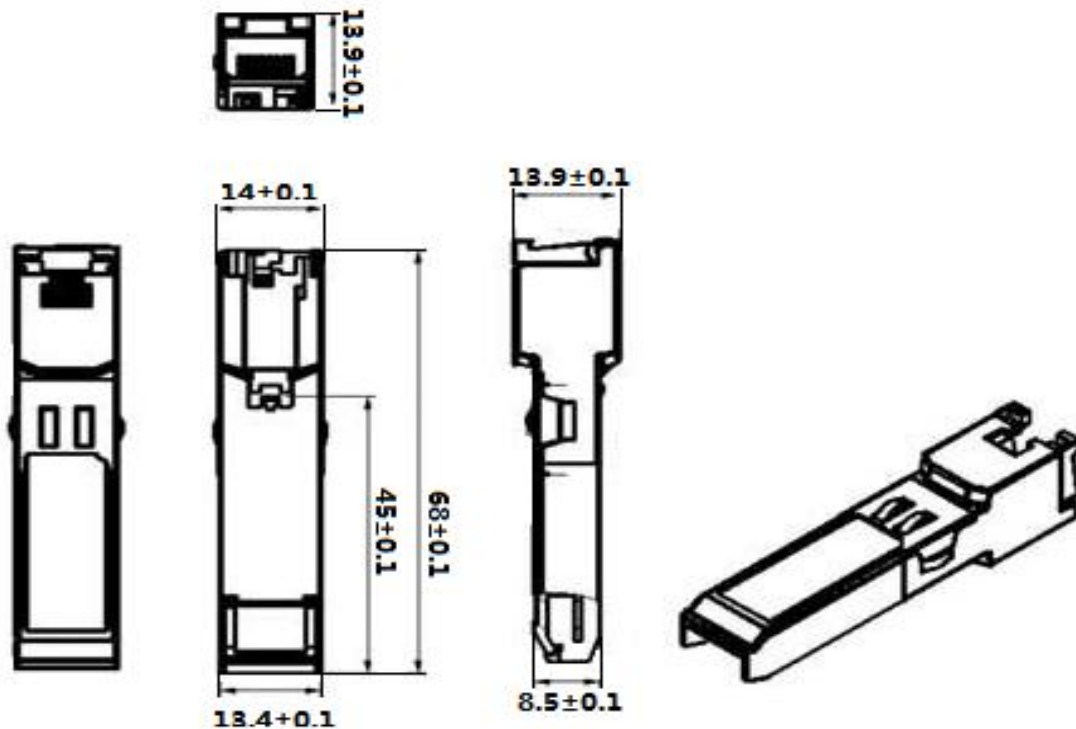
1. TX Fault is not supported and is always connected to ground.
2. ①TX disable, an input used to reset the transceiver module, This pin is pulled up within the module with a

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- 4.7k Ω resistor.
- ② Transceiver low voltage (0 -- 0.8 V) undefined.
- ③ When the transceiver has high voltage (2.0 -- 3.465 V), it is in the reset state and open circuit.
3. ① Module definition pin, on the main board with 4.7k ~10K resistance pull up, pull up voltage should be VccT or VccR.
- ② Mod-Def (0) ground connection.
- ③ Mod-Def (1) is the clock line of a two-wire serial interface for a serial ID.
- ④ Mod-Def (2) is the data line of the serial ID's two-wire serial interface.
4. LVTTTL compatible with a maximum voltage of Host_Vcc. This pin can be enabled or disabled, 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 termination inside the module.

Mechanical Dimensions



Ordering information

Part Number	Product Description
S-SP1GR01-C	SFP, 1000Mb/s, Copper, RJ45 100M, 0°C~+70°C