

SO-SFP-1000BASE-TR

SFP, 1000Base-T SERDES Interface, Rx-LOS detection

OVERVIEW

The SO-SFP-1000Base-TR series are 1000BASE-T Copper Small Form Pluggable (SFP) modules are based on the SFP Multi Source Agreement (MSA). It is compliant with the Gigabit Ethernet and 1000BASE-T standards as specified in IEEE STD 802.3 and 802.3ab.

PRODUCT FEATURES

- Support 1000BASE-T operation in host systems
- Support RX_LOS as link indication function
- For 100m reach over UTP Cat5 cable
- Hot-Pluggable SFP footprint
- Fully metallic enclosure for low EMI
- Low power dissipation (1.05 W typical)
- Compact RJ-45 connector assembly
- Access to physical layer IC via 2-wire serial bus
- Detailed product information in EEPROM
- Operating case temperature
 - Standard: 0 °C~+70 °C
 - Industrial: -40 °C ~+85 °C
- Compliant with IEEE Std 802.3-2002

APPLICATIONS

- LAN 1000Base-T
- Gigabit Ethernet over Cat5 cable
- Switch-to-Switch interface
- Router/Server interface

ORDERING INFORMATION

Part Number	Description
SO-SFP-1000Base-TR	SFP, 1000Base-T SERDES Interface, Rx-LOS detection
SO-SFP-1000Base-TR-I	SFP, 1000Base-T SERDES Interface, Rx-LOS detection, ind.temp.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Maximum Supply Voltage	VCC	-0.5	4.0	V
Storage Temperature	TS	-40	85	°C

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Case Operating Temperature	T_c	SO-SFP-1000Base-TR	0	+70	°C
		SO-SFP-1000Base-TR -I	-40	+85	
Power Supply Voltage	Vcc	3.15	3.3	3.45	V
Data rate		10		1000	Mbps

ELECTRICAL CHARACTERISTICS +3.3 VOLT ELECTRICAL POWER INTERFACE

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Supply Current	I_{cc}		300	350	mA	
Input Voltage	Vcc	3.15	3.3	3.47	V	
Surge Current	I_{surge}			30	mA	

ELECTRICAL CHARACTERISTICS LOW-SPEED SIGNALS, ELECTRONIC CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit	Notes
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_Vcc0.5		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

ELECTRICAL CHARACTERISTICS HIGH-SPEED ELECTRICAL INTERFACE, TRANSMISSION LINE-SFP

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Line Baud Rates	f_L		125		MHz	5-level encoding, per IEEE 802.3
TX Output impedance	$Z_{out, TX}$		100		Ohm	Differential, for all frequencies between 1MHz and 1250MHz
RX Input Impedance	$Z_{in, RX}$		100		ohm	Differential, for all frequencies between 1MHz and 1250MHz

Subject to change without notice.

For more information, visit smaroptics.com.

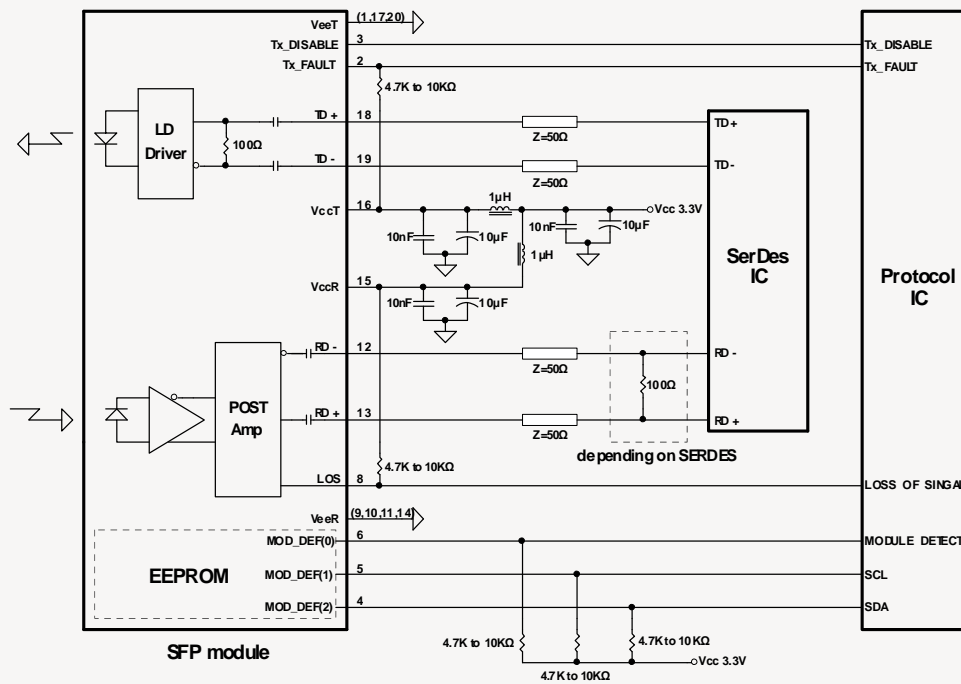
ELECTRICAL CHARACTERISTICS HIGH-SPEED ELECTRICAL INTERFACE, HOST-SFP

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Single ended data input swing	V_{in}	250		1200	mV	Single ended
Single ended data output swing	V_{out}	350		800	mV	Single ended
Rise/Fall Time	T_r, T_f		175		psec	20%-80%
TX Input Impedance	Z_{in}		50		Ohm	Single ended
RX Output Impedance	Z_{out}		50		ohm	Single ended

GENERAL SPECIFICATIONS

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data rate			1000		Mbps	
Distance				100	m	Category 5 UTP. BER <10 ⁻¹²

RECOMMENDED CIRCUIT SCHEMATIC



PIN FUNCTION DEFINITIONS

PIN	Signal Name	Description	PIN	Signal Name	Description
1	V _{EE} T	Transmitter Signal Ground	11	V _{EE} R	Receiver Signal Ground
2	TX_Fault	Transmitter Fault Indication. Logic "1" Output = Laser Fault. Logic "0" Output = Normal Operation	12	RD-	Inverse Receiver Data Out
3	TX_Disable	Logic "1" Input (or no connection) = Laser off, Logic "0" = Laser on.	13	RD+	Receiver Data Out
4	SDA	Modulation Definition 2 – Two wires serial ID Interface	14	V _{EE} R	Receiver Signal Ground
5	SDL	Modulation Definition 1 – Two wires serial ID Interface	15	V _{CC} R	Receiver Power – 3.3V±5%

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6	MOD-ABS	Modulation Definition 0 – Ground in Module	16	V _{CC} T	Transmitter Power – 3.3V±5%
7	RS0	RX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance.	17	V _{EE} T	Transmitter Signal Ground
8	RX_LOS	Loss of Signal Out (OC).	18	TD+	Transmitter Data In
9	RS1	TX Rate Select (LVTTTL). This pin has an internal 30k pulldown to ground. A signal on this pin will not affect module performance.	19	TD-	Inverse Transmitter Data In
10	V _{EE} R	Receiver Signal Ground	20	V _{EE} T	Transmitter Signal Ground

MECHANICAL DRAWING

