

SNR-SFP100-T

Copper SFP 10/100M Transceiver

SNR-SFP100-T 10/100M Copper SFP Series

10/100BASE-T Copper SFP Transceiver
RoHS6 Compliant

Features

- ◆ Support 10/100BASE-T Operation in Host Systems
- ◆ For 100m Reach over Cat 5 UTP Cable
- ◆ Hot-Pluggable SFP Footprint
- ◆ Fully metallic enclosure for low EMI
- ◆ Low power dissipation
- ◆ 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
- ◆ Compliant with SFP MSA
- ◆ Compliant with IEEE Std 802.3



Applications

- ◆ LAN 10/100Base-T
- ◆ Switch to Switch Interface
- ◆ Router/Server Interface
- ◆ Switched backplane applications

Order Information

Part No.	Data Rate	Link Type	Connector	LOS Function	Distance	Temperature
SNR-SFP100-T	10/100M	Cat5	RJ45	With	100m	Standard

Note1: Standard version

Regulatory Compliance

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Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883G Method 3015.7	Class 1C (>1000V)
Electrostatic Discharge to the enclosure	EN 55024:1998+A1+A2 IEC-61000-4-2 GR-1089-CORE	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022:2006 CISPR 22B :2006 VCCI Class B	Compatible with standards Noise frequency range: 30MHz to 6GHz. Good system EMI design practice required to achieve Class B margins. System margins are dependent on customer host board and chassis design.
Immunity	EN 55024:1998+A1+A2 IEC 61000-4-3	Compatible with standards. 1KHz sine-wave, 80% AM, from 80MHz to 1GHz. No effect on transmitter/receiver performance is detectable between these limits.
RoHS6	2002/95/EC 4.1&4.2 2005/747/EC 5&7&13	Compliant with standards ^{*note3}

Note2: For update of the equipments and strict control of raw materials, SNR has the ability to supply the customized products since Jan 1, 2007, which meet the requirements of RoHS6 (Restrictions on use of certain Hazardous Substances) of European Union.

In light of item 5 in RoHS exemption list of RoHS Directive 2002/95/EC, Item 5: Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.

In light of item 13 in RoHS exemption list of RoHS Directive 2005/747/EC, Item13: Lead and cadmium in optical and filter glass. The three exemptions are being concerned for SNR's transceivers, because SNR's transceivers use glass, which may contain Pb, for components such as lenses, windows, isolators, and other electronic components.

Product Description

SNR-SFP100-T series is a 10/100BASE-T Copper Small Form Pluggable (SFP), which is based on the SFP Multi Source Agreement (MSA). It's high performance, cost effective module compliant with the 100BASE-T standards as specified in IEEE 802.3-2002 and IEEE 802.3u, which supporting 100Mbps up to 100 meters reach over unshielded twisted-pair category-5 cable. SNR-SFP100-T can perform any necessary scrambling / descrambling between the 100Base-TX and 100Base-FX formats and support intelligent auto-negotiation 100BASE-T

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operation in host systems.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max
Maximum Supply Voltage	V _{cc}	-0.5		4.0
Storage Temperature	T _s	-40		85

Normal operating condition

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Operating Case Temperature	Top	0		70	°C	Standard
Supply Voltage	V _{cc}	3.15	3.3	3.45	V	

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
+3.3 Volt Electrical Power Interface						
Supply Current	I _{cc}		170	300	mA	
Input Voltage	V _{cc}	3.13	3.3	3.47	V	
Surge Current	I _{surge}			30	mA	
Low-Speed Signals, Electronic Characteristics						
SFP Output LOW	V _{OL}	0		0.5	V	4.7k to 10k pull-up to host_V _{cc} , measured at host side of connector
SFP Output HIGH	V _{OH}	host_V _{cc} -0.5		host_V _{cc} +0.3	V	4.7k to 10k pull-up to host_V _{cc} , measured at host side of connector
SFP Input LOW	V _{IL}	0		0.8	V	4.7k to 10k pull-up to V _{cc} , measured at SFP side of connector
SFP Input HIGH	V _{IH}	2		V _{cc} + 0.3	V	4.7k to 10k pull-up to V _{cc} , measured at SFP side of connector
High-Speed Electrical Interface, Transmission Line-SFP^{*note3}						
Line Baud Rates	f _L		125		MHz	MLT-3 encoding per IEEE802.3u
TX Output impedance	Z _{out, TX}		100		Ohm	Differential, AC coupled Internally

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RX Input Impedance	Zin, RX		100		Ohm	Differential, AC coupled Internally
High-Speed Electrical Interface, Host-SFP^{*note3}						
Single ended data input swing	Vin	250		1200	mV	Single ended
Single ended data output swing	Vout	300		1000	mV	Single ended
Rise/Fall Time	Tr, Tf		3		nsec	20%-80%
TX Input Impedance	Zin		50		Ohm	Single ended
RX Output Impedance	Zout		50		Ohm	Single ended

Note3: For detail information, refer to the recommend circuit.

General specifications

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Data rate			125		Mbps	
Distance				100	m	Category 5 UTP. BER <10 ⁻¹²

Pin Descriptions

Pin No.	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable	3	2
4	MOD-DEF2	Module Definition 2	3	3
5	MOD-DEF1	Module Definition 1	3	3
6	MOD-DEF0	Module Definition 0	3	3
7	Rate Select	Not Connected	3	
8	LOS	Los of Signal	3	4
9	VeeR	Receiver Ground	1	
10	VeeR	Receiver Ground	1	
11	VeeR	Receiver Ground	1	
12	RD-	Inv. Received Data Out	3	5
13	RD+	Received Data Out	3	5
14	VeeR	Receiver Ground	1	
15	VccR	Receiver Power	2	6
16	VccT	Transmitter Power	2	6
17	VeeT	Transmitter Ground	1	

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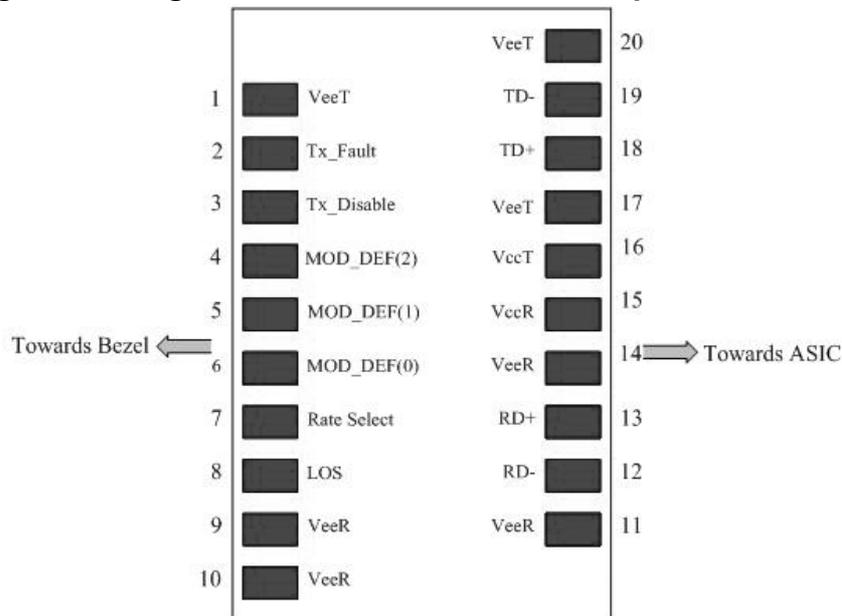
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18	TD+	Transmit Data In	3	7
19	TD-	Inv. Transmit Data In	3	7
20	VeeT	Transmitter Ground	1	

Notes:

1. TX Fault is not used and tied to ground within the module.
2. TX Disable is not used and is not connected within the module.
3. MOD-DEF 0,1,2 are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
MOD-DEF 0 is tied to ground within the module.
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. These are the differential receiver output. Internally AC-coupled in the transceiver. 100Ω differential lines and 100 Ω terminate resistor should be used on the host board.
5. VccT and VccR are internally connected together in the transceiver.
6. These are the differential receiver input. Internally AC-coupled in the transceiver. 100Ω differential lines and 100 Ω terminate resistor is used in the transceiver.

The following is the Diagram of host board connector pin numbers and names



Serial Communication Protocol

SNR Copper SFP support the 2-wire serial communication protocol defined in the SFP MSA. These SFP use a 128 byte EEPROM with an address of A0H. The 10/100/BASE-T physical layer IC can also be accessed via the 2-wire serial bus at address ACH.

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EEPROM Serial ID Memory Contents

Accessing Serial ID Memory uses the 2 wire address 1010000X (A0H). Memory Contents of Serial ID are shown in Table 1.

Table 1 Serial ID Memory Contents

Addr.	Size (Bytes)	Name of Field	Hex	Description
BASE ID FIELDS				
0	1	Identifier	03	SFP
1	1	Ext. Identifier	04	SFP function is defined by serial ID only
2	1	Connector	22	RJ-45
3-10	8	Transceiver	00 00 00 20 00 00 00 00	100BASE-FX
11	1	Encoding	02	4B5B
12	1	BR, Nominal	01	100M
13	1	Reserved	00	
14	1	Length (9µm)km	00	Transceiver transmit distance
15	1	Length(9µm)100m	00	
16	1	Length (50µm) 10m	00	
17	1	Length(62.5µm)10m	00	
18	1	Length (Copper)	64	100m
19	1	Reserved	00	
20-35	16	Vendor name	XX XX XX XX XX XX XX XX XX ^(note3) 20 20 20 20 20 20 20 20 20	Vendor name (ASCII)
36	1	Reserved	00	
37-39	3	Vendor OUI	XX XX XX ^(note3)	
40-55	16	Vendor PN		Transceiver part number
56-59	4	Vendor rev	XX XX XX XX ^(note3)	
60-61	2	Wavelength	00	
62	1	Reserved	00	
63	1	CC_BASE	Check Sum (Variable)	Check code for Base ID Fields
EXTENDED ID FIELDS				
64-65	2	Options	00 00	
66	1	BR,max	00	
67	1	BR,min	00	
68-83	16	Vendor SN	XX XX XX XX XX XX XX XX XX 20 20 20 20 20 20 20 20 ^(note3)	Serial Number of transceiver (ASCII). For example "B000822".
84-91	8	Date code	XX XX XX XX XX XX XX XX XX ^(note4)	Manufacture date code. For example "080405".
92-94	3	Reserved	XX ^(note4)	
95	1	CC_EXT	Check Sum (Variable)	Check sum for Extended ID Field.
VENDOR SPECIFIC ID FIELDS				
96-127	32	Vendor Specific	Read only	Depends on customer information
128-255	128	Reserved	Read only	

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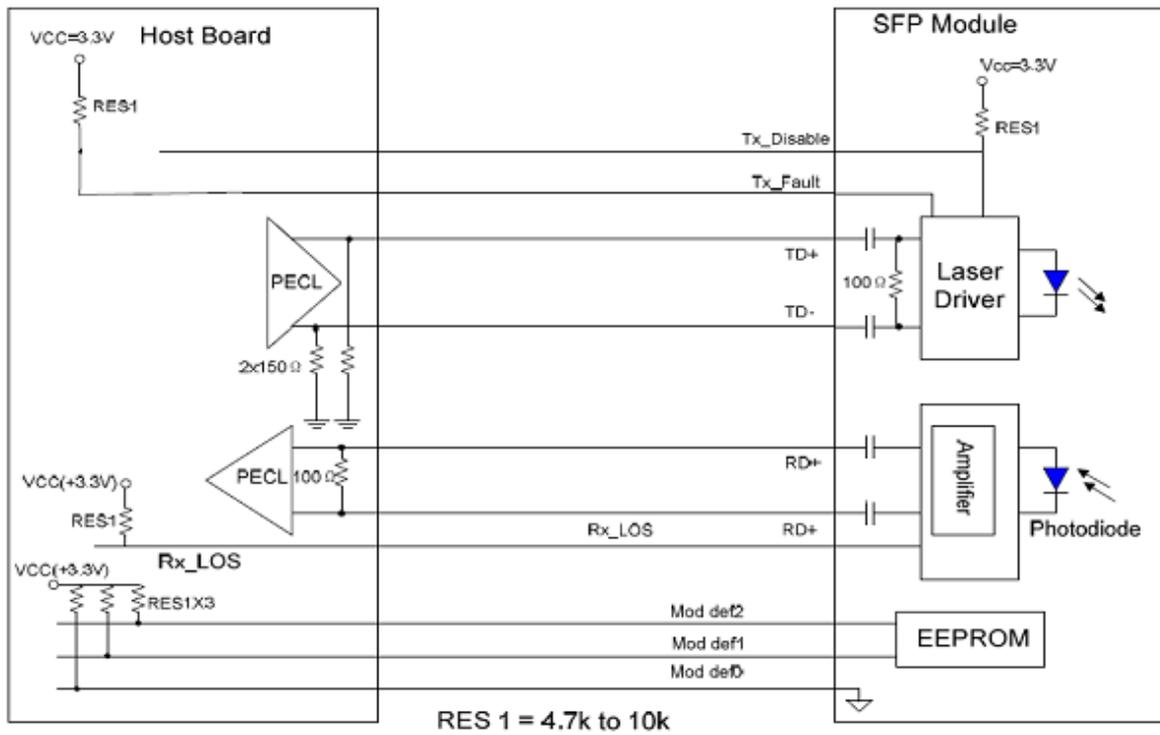
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Note4: The “XX” byte should be filled in according to practical case. For more information, please refer to the related document of SFP Multi-Source Agreement (MSA).

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Recommended Circuit Schematic



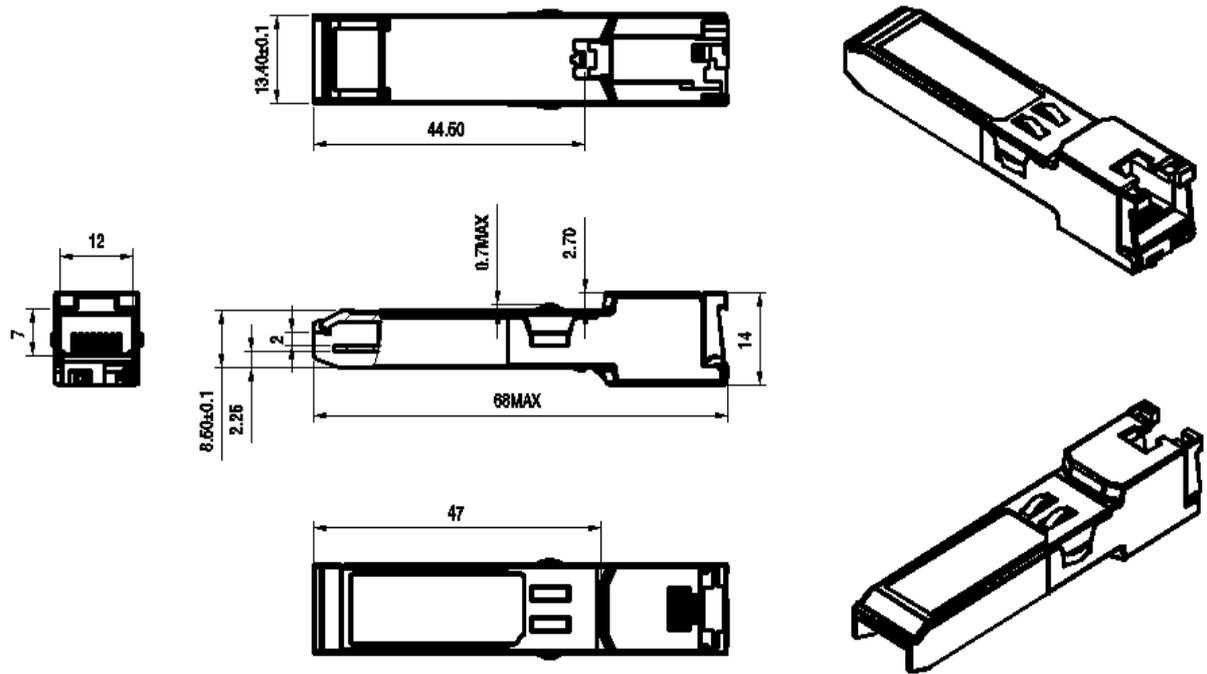
Note5: if TX_disable, LOSS and Tx_Fault are used, they should be connected as the recommend circuit.

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Mechanical Specifications

SNR's Copper SFP transceivers are compliant with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



Notice:

SNR reserves the right to make changes to or discontinue any optical link product or service identified in this publication, without notice, in order to improve design and/or performance. Applications that are described herein for any of the optical link products are for illustrative purposes only. SNR makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

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