# SNR-SFP+T

## SNR-SFP+T

**10GBASE-T Copper SFP+ Transceiver**


### Features

- Support 10GBASE-T Operation in Host Systems
- Support RX_LOS as Link indication function
- Hot-Pluggable SFP Footprint
- Compact RJ-45 Connector Assembly
- Compliant with SFP MSA
- Operating Case Temperature：
  Standard：0℃~70℃

### Applications

- 10G BASE-T IEEE 802.3an
- 1000BASE-T IEEE 802.3ab
- 100BASE-TX IEEE 802.3u
- 5G MGBASE-T
- 2.5G MGBASE-T

### Order Information

| Part No. | Data Rate | Media type | Distance | Connector | Temperature |
|---|---|---|---|---|---|
| SNR-SFP+T | 10G | CAT6A/CAT7 | 20m | RJ45 | Standard |

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## Regulatory Compliance

| Product Certificate | Certificate Number | Applicable Standard |
|---|---|---|
| TUV | R50135086 | EN 60950-1:2006+A11+A1+A12+A2 |
| | | EN 60825-1:2014 |
| | | EN 60825-2:2004+A1+A2 |
| UL | E317337 | UL 60950-1 |
| | | CSA C22.2 No. 60950-1-07 |
| EMC CE | AE 50285865 0001 | EN 55022:2010 |
| | | EN 55024:2010 |
| FCC | WTF14F0514417E | 47 CFR PART 15 OCT., 2013 |
| FDA | / | CDRH 1040.10 |
| ROHS | / | 2011/65/EU |

## Product Description

SNR-SFP+T 10G BASE-T Copper Small Form Pluggable (SFP) modules are based on the SFP Multi Source Agreement (MSA). It is compliant with the 10G BASE-T,1000BASE-T, 100BASE-TX standards as specified in IEEE STD 802.3an, 802.3ab and 802.3au.

## Absolute Maximum Ratings*

| Parameter | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Maximum Supply Voltage | Vcc | -0.5 | | 4.0 | V |
| Storage Temperature | $T_S$ | -40 | | 85 | °C |

*Exceeding any one of these values may destroy the device permanently.

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## Normal operating condition

| Parameter | Symbol | | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| Operating Case Temperature | Tc | SNR-SFP+T | 0 | | 70 | °C |
| Supply Voltage | Vcc | | 3.14 | 3.3 | 3.46 | V |

## Electrical Characteristics

| Parameter | Symbol | Min | Typ | Max | Units | Notes/Conditions |
|---|---|---|---|---|---|---|
| **+3.3 Volt Electrical Power Interface** | | | | | | |
| Supply Current | Icc | | | 800 | mA | |
| Input Voltage | Vcc | 3.13 | 3.3 | 3.47 | V | |
| **Low-Speed Signals, Electronic Characteristics** | | | | | | |
| SFP Output LOW | $V_{OL}$ | 0 | | 0.5 | V | 4.7k to 10k pull-up to host_Vcc, measured at host side of connector |
| SFP Output HIGH | $V_{OH}$ | 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** | | | | | | |
| 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** | | | | | | |
| Single ended data input swing | Vin | 250 | | 1200 | mV | Single ended |
| Single ended data output swing | Vout | 350 | | 800 | mV | Single ended |
| Rise/Fall Time | Tr,Tf | | 20 | | psec | 20%-80% |
| Tx Input Impedance | Zin | | 50 | | Ohm | Single ended |

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| | | | | | | |
|---|---|---|---|---|---|---|
| Rx Output Impedance | Zout | | 50 | | Ohm | Single ended |

## Pin Descriptions

| Pin No. | Name | Function | Plug Seq. | Notes |
|---|---|---|---|---|
| 1 | VeeT | Transmitter Ground | 1 | |
| 2 | TX Fault | Transmitter Fault Indication | 3 | Not used |
| 3 | TX Disable | Transmitter Disable | 3 | 1 |
| 4 | MOD-DEF2 | Module Definition 2 | 3 | 2 |
| 5 | MOD-DEF1 | Module Definition 1 | 3 | 2 |
| 6 | MOD-DEF0 | Module Definition 0 | 3 | 2 |
| 7 | RS0 | No Connection required | 3 | |
| 8 | LOS | Loss of Signal | 3 | RX_LOSS |
| 9 | RS1 | No Connection required | 1 | |
| 10 | VeeR | Receiver Ground | 1 | |
| 11 | VeeR | Receiver Ground | 1 | |
| 12 | RD- | Inv. Received Data Out | 3 | |
| 13 | RD+ | Received Data Out | 3 | |
| 14 | VeeR | Receiver Ground | 1 | |
| 15 | VccR | Receiver Power | 2 | |
| 16 | VccT | Transmitter Power | 2 | |
| 17 | VeeT | Transmitter Ground | 1 | |
| 18 | TD+ | Transmit Data In | 3 | |
| 19 | TD- | Inv. Transmit Data In | 3 | |
| 20 | VeeT | Transmitter Ground | 1 | |

**Notes:**

1. PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V, used to reset the module.
2. Should be pulled up with 4.7k – 10k Ohm on host board to a voltage between 2.0 V and 3.6 V. MOD_DEF(0) pulls line low to indicate module is plugged in.

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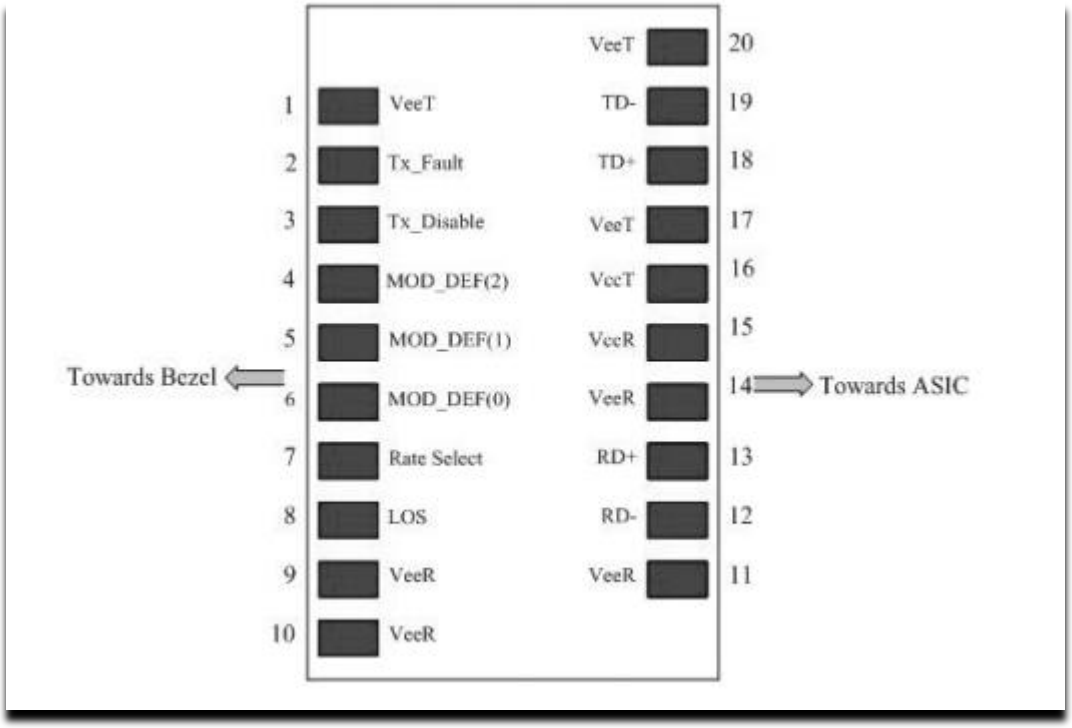
**The following is the Diagram of host board connector block pin numbers and names**




## Serial Communication Protocol

SNR Copper SFPs support the 2-wire serial communication protocol outlined in the SFP MSA, These SFP use a 128 byte EEPROM with an address of A0H.

## 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.

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**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 | 07 | -LC |
| 3-10 | 8 | Transceiver | 10 00 00 00 00 00 00 00 | Transmitter Code |
| 11 | 1 | Encoding | 06 | 64B/66B |
| 12 | 1 | BR, Nominal | 67 | 10.3G |
| 13 | 1 | Reserved | 00 | - |
| 14 | 1 | Length (9μm)km | 00 | |
| 15 | 1 | Length(9μm)100m | 00 | |
| 16 | 1 | Length (50μm) 10m | 08 | 80m |
| 17 | 1 | Length(62.5μm)10m | 02 | 20m |
| 18 | 1 | Length (Copper) | 00 | |
| 19 | 1 | Reserved | 1E | 300m |
| 20-35 | 16 | Vendor name | XX XX XX XX XX XX XX XX XX XX[(note3)]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 | XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX[(note3)] | Transceiver part number |
| 56-59 | 4 | Vendor rev | XX XX XX XX[(note3)] | - |
| 60-61 | 2 | Wavelength | 03 52 | -850nm |
| 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 1A | TX_DISABLE, TX_FAULT and Loss of Signal implemented. |
| 66 | 1 | BR,max | 00 | |
| 67 | 1 | BR,min | 00 | |

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| | | | | |
|---|---|---|---|---|
| 68-83 | 16 | Vendor SN | 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(note3) | Manufactory date code. For example “080405”. |
| 92 | 1 | Diagnostic Monitoring Type | XX(note3) | Digital diagnostic monitoring implemented |
| 93 | 1 | Enhanced Options | XX(note3) | Optional flags |
| 94 | 1 | SFF_8472 Compliance | XX(note3) | 01 for diagnostics (Rev9.3 SFF-8472). |
| 95 | 1 | CC_EXT | Check Sum | Check sum for Extended ID |
| | | | (Variable) | Field. |
| **VENDOR SPECIFIC ID FIELDS** | | | | |
| 96-127 | 32 | Vendor Specific | Read only | Depends on customer information |
| 128-255 | 128 | Reserved | Read only | - |

Note3: 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).

## Mechanical Specifications

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