# SFP-1G-T-AXR

1000Base-T SFP
Copper (SERDES)
100m Reach

+45 (0)32 72 66 76
info@nexgen.eu
www.nexgen.eu

## Features

- Supports 1000Mb Data rate
- Up to 100m on Cat 5 copper cable
- Compact RJ-45 connector assembly
- Fully metal enclosure, for lower EMI
- RoHS compliant and lead-free
- No DDM functions
- Single +3.3V power supply
- Power consumption less than 1.05 W
- Operating case temperature: 0°C to +70°C


## Applications

- 1000Base-T
- Gigabit Ethernet over Cat 5 Cable

| Part number | Product description |
|---|---|
| SFP-1G-T-AXR | 1000Base-T SerDes SFP Copper 100m 0°C to 70°C RJ45 Auto-negX Rx_LOS No DDM |
| SFP-1G-T-AXR-I | 1000Base-T SerDes SFP Copper 100m -40°C to 85°C RJ45 Auto-negX Rx_LOS No DDM |

# PIN Description

| PIN | Symbol | Name - Description | Notes |
|---|---|---|---|
| 1 | VEET | Transmitter Ground (Common with Receiver Ground) | |
| 2 | TFAULT | Transmitter Fault. Not supported. | 1 |
| 3 | TDIS | Transmitter Disable. Laser output disabled on high or open. | 2 |
| 4 | MOD_DEF(2) | Module Definition 2. Data line for Serial ID. | 1 |
| 5 | MOD_DEF(1) | Module Definition 1. Clock line for Serial ID. | 1 |
| 6 | MOD_DEF(0) | Module Definition 0. Grounded within the module. | 1 |
| 7 | Rate Select | No connection required | |
| 8 | LOS | Loss of Signal indication. Logic 0 indicates normal operation. | 3 |
| 9 | VEER | Receiver Ground (Common with Transmitter Ground) | |
| 10 | VEER | Receiver Ground (Common with Transmitter Ground) | |
| 11 | VEER | Receiver Ground (Common with Transmitter Ground) | |
| 12 | RD- | Receiver Inverted DATA out. AC Coupled | 4 |
| 13 | RD+ | Receiver Non-inverted DATA out. AC Coupled | 4 |
| 14 | VEER | Receiver Ground (Common with Transmitter Ground) | |
| 15 | VCCR | Receiver Power Supply | |
| 16 | VCCT | Transmitter Power Supply | |
| 17 | VEET | Transmitter Ground (Common with Receiver Ground) | |
| 18 | TD+ | Transmitter Non-Inverted DATA in. AC Coupled. | 5 |
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled. | 5 |
| 20 | VEET | Transmitter Ground (Common with Receiver Ground) | |

Notes:

1. Open collector/drain output, which should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board if intended for use. Pull up voltage should be between 2.0V to 3.6V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
2. Laser output disabled on Tx_Disable >2.0V or open, enabled on Tx_Disable <0.8V.
3. LOS is open collector output. Should be pulled up with 4.7kΩ to 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
4. RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES.
5. TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

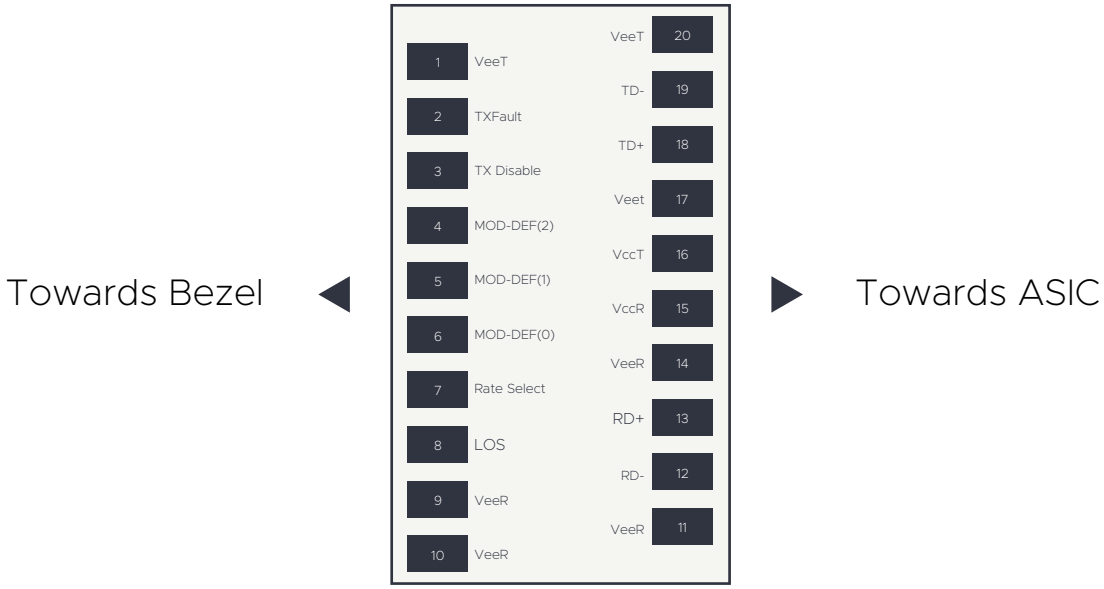



Figure 1. Diagram of host board connector block pin numbers and names

## Recommended Operating Conditions

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Supply Voltage | Vcc | 3.15 | 3.30 | 3.47 | V | |
| Storage Temperature | Ts | -40 | - | +85 | °C | |
| Operating Temperature (Commercial) | Tc | 0 | - | +70 | °C | |
| Operating Temperature (Industrial) | Ti | -40 | - | +85 | °C | |
| Relative Humidity | RH | 5 | - | 85 | % | 1 |

Notes:
1. Non-condensing.

## Transmission Rate

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Data Rate | - | - | - | 1000 | Mbps | 1 |
| Transmission Distance | Td | - | - | 100 | m | 2 |

Notes:
1. 1000 BASE-T operation based on SERDES interfaces (preferred master mode)
2. On Category 5 UTP cable, BER≤10^-12

## High-speed Electrical Interface (Host SFP)

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| TD+, TD- Input voltage Swing | Vinsing | 250 | - | 1200 | mV | 1 |
| RD+, RD- Output voltage Swing | Voutsing | 350 | - | 800 | mV | 1 |
| Rise/Fall Time | Tr,Tf | - | 175 | - | ps | 2 |
| Tx Input Impedance | Zin | - | 50 | - | Ω | 1 |
| Rx Output Impedance | Zout | -5 | 50 | - | Ω | 1 |

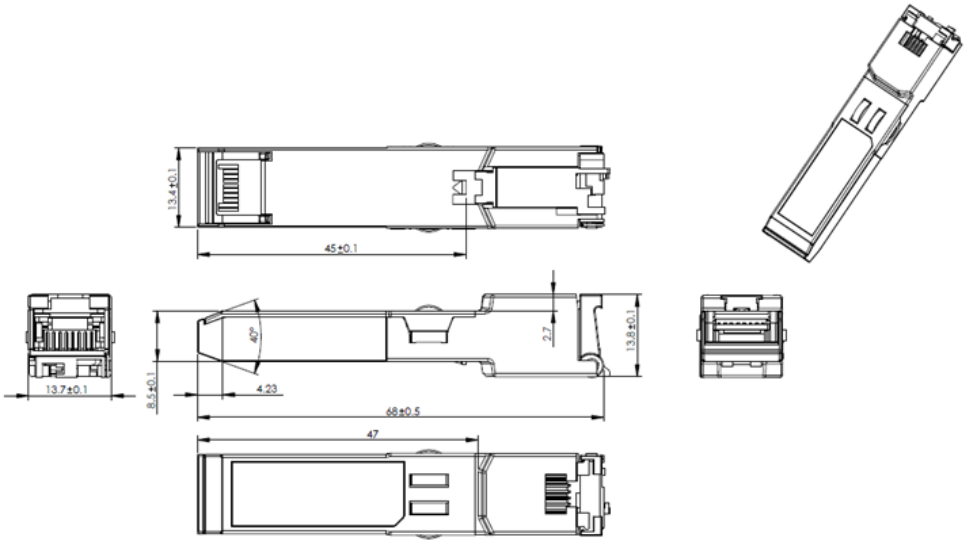
Notes:
1. Single ended
2. 20% to 80% value

## High-speed Electrical Interface (Cable to SFP)

| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
|---|---|---|---|---|---|---|
| Transmission Frequency | fL | - | 125 | - | MHz | 1 |
| Tx Input Impedance | Zin | - | 100 | - | Ω | 2 |
| Rx Output Impedance | Zout | - | 100 | - | Ω | 2 |

Notes:
1. 4D-PAM-5 encoding per IEEE802.3: 2002
2. Differential for frequencies ranging from 1 MHz to 125 MHz

# Mechanical Dimensions




# Revision history

| Revision | Date | Author | Description |
|---|---|---|---|
| V1.2 | 05-03-2020 | JGN | Initial Document |

Note : Nexgen A/S reserves the right to change this document without notice.