



RoHS compliant
1000T/ Gigabit Ethernet
SFP-T 1000 Base only



Features:

- Up to 1.25 Gb/s bi-directional data links
- Hot-pluggable SFP footprint
- Low power dissipation(1.05W typical)
- Compact RJ-45 connector assembly
- Fully metal enclosure, for lower EMI
- RoHS compliant and lead-free
- Single +3.3V power supply
- 1000 BASE-T operation in host systems with Serdes interface
- Gigabit Ethernet over Cat 5 cable
- Ambient Operating temperature: -20°C to +75°C

Application

- Distributed multi-processing
- Switch to switch interface
- High speed I/O for file server
- Bus extension application
- Channel extender, data storage

Ordering Information

| PART NUMBER | INPUT/OUTPUT | MONITOR | VOLTAGE | TEMPERATURE |
|---------------|--------------|---------|---------|----------------|
| CL-SFP T 1000 | AC/AC | X | 3.3V | -20°C to 75 °C |



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Product selection

| <i>P/N</i> | Link Indicator on RX_LOS Pin | 1000BASE-X auto-negotiation enabled by default |
|---------------|------------------------------|--|
| CL-SFP-T 1000 | <i>Yes</i> | <i>No</i> |

SFP to Host Connector Pin Out

| <i>PIN</i> | <i>SYMBOL</i> | <i>Name/ Description</i> | <i>Ref.</i> |
|------------|--------------------|---|-------------|
| 1 | V _{EET} | Transmitter Ground (Common with Receiver Ground) | 1 |
| 2 | T _{FAULT} | Transmitter Fault. Not supported. | |
| 3 | T _{DIS} | Transmitter Disable. Laser output disabled on high or open. | 2 |
| 4 | MOD_DEF(2) | Module Definition 2. Data line for Serial ID. | 3 |
| 5 | MOD_DEF(1) | Module Definition 1. Clock line for Serial ID. | 3 |
| 6 | MOD_DEF(0) | Module Definition 0. Grounded within the module. | 3 |
| 7 | Rate Select | No connection required | |
| 8 | LOS | | |
| 9 | V _{EER} | Receiver Ground (Common with Transmitter Ground) | 1 |
| 10 | V _{EER} | Receiver Ground (Common with Transmitter Ground) | 1 |
| 11 | V _{EER} | Receiver Ground (Common with Transmitter Ground) | 1 |
| 12 | RD- | Receiver Inverted DATA out. AC Coupled | |
| 13 | RD+ | Receiver Non-inverted DATA out. AC Coupled | |
| 14 | V _{EER} | Receiver Ground (Common with Transmitter Ground) | 1 |
| 15 | V _{CCR} | Receiver Power Supply | |
| 16 | V _{CCT} | Transmitter Power Supply | |
| 17 | V _{EET} | Transmitter Ground (Common with Receiver Ground) | 1 |
| 18 | TD+ | Transmitter Non-Inverted DATA in. AC Coupled. | |
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled. | |
| 20 | V _{EET} | Transmitter Ground (Common with Receiver Ground) | 1 |



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Notes:

1. Circuit ground is connected to chassis ground
2. PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V
3. Should be pulled up with 4.7k - 10k Ohms 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.

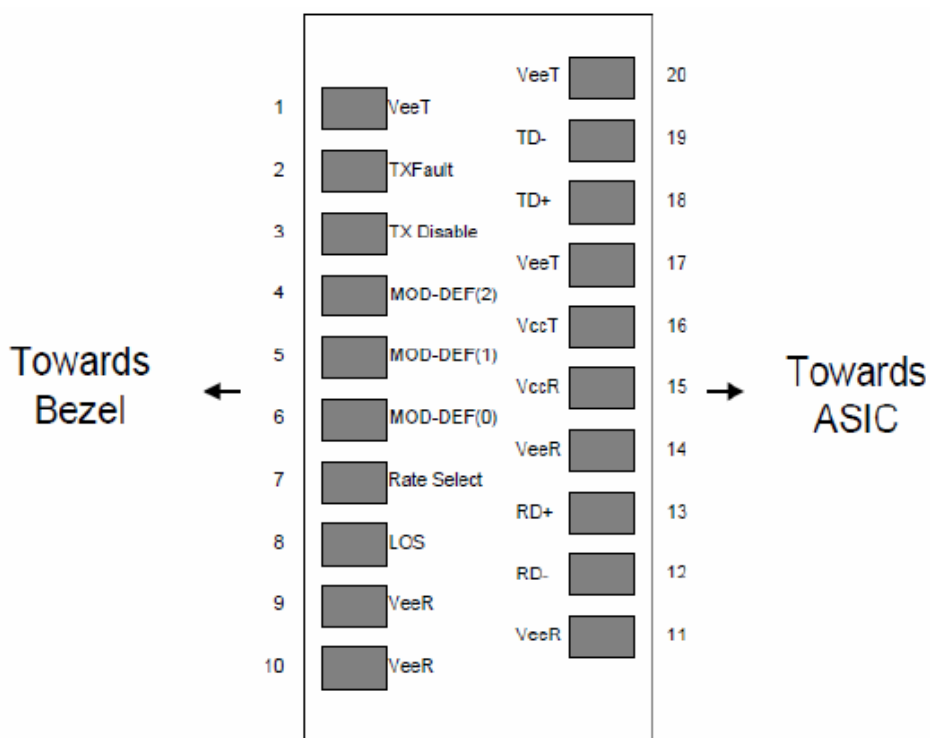


Figure 1. Diagram of host board connector block pin numbers and names

II. +3.3V Volt Electrical Power Interface



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Both 2 models have an input voltage range of 3.3 V +/- 5%. The 4V maximum voltage is not allowed for continuous operation.

| +3.3 Volt Electrical Power Interface | | | | | | |
|---|--------|------|-----|------|------|---|
| Parameter | Symbol | Min | Typ | Max | unit | Notes/Conditions |
| Supply Current | Is | | 320 | 375 | mA | 1.2W max power over full range of voltage and temperature. See caution note below |
| Input Voltage | Vcc | 3.13 | 3.3 | 3.47 | V | Referenced to GND |
| Maximum Voltage | Vmax | | | 4 | V | |
| Surge Current | Isurge | | | 30 | mA | Hot plug above steady state current. See caution note below |

Caution: Power consumption and surge current are higher than the specified values in the SFP MSA

III. Low-Speed Signals

MOD_DEF(1) (SCL) and MOD_DEF(2) (SDA), are open drain CMOS signals (see section VII, "Serial Communication Protocol"). Both MOD_DEF(1) and MOD_DEF(2) must be pulled up to host_Vcc

| Low-Speed Signals, Electronic Characteristics | | | | | | |
|--|--------|---------------|----------------|------|---|--|
| Parameter | Symbol | Min | Max | unit | 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 | |

IV. High-Speed Electrical Interface



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All high-speed signals are AC-coupled internally.

| High-Speed Electrical Interface, Transmission Line-SFP | | | | | | |
|---|---------|-----|-----|-----|------|---|
| Parameter | Symbol | Min | Typ | Max | unit | 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 | unit | Notes/Conditions |
| Single ended data input swing | V _{ising} | 250 | | 1200 | mV | Single ended |
| Single ended data output swing | V _{outing} | 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 |

V. General Specifications



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| General | | | | | | |
|--------------|--------|-----|-----|------|--------|---|
| Parameter | Symbol | Min | Typ | Max | unit | Notes/Conditions |
| Data Rate | BR | 10 | | 1000 | Mb/sec | IEEE 802.3 compatible. See Notes 2 through 4 below |
| Cable Length | L | | | 100 | m | Category 5 UTP. BER |

Notes:

1. Clock tolerance is +/- 50 ppm
2. By default, the CL-SFP-T1000 is a full duplex device in preferred master mode
3. Automatic crossover detection is enabled. External crossover cable is not required

VI. Environmental Specifications

| Environmental Specifications | | | | | | |
|------------------------------|--------|-----|-----|-----|------|---------------------|
| Parameter | Symbol | Min | Typ | Max | unit | Notes/Conditions |
| Operating Temperature | Top | -20 | | 75 | °C | Case temperature |
| Storage Temperature | Tsto | -40 | | 85 | °C | Ambient temperature |

VII. Serial Communication Protocol

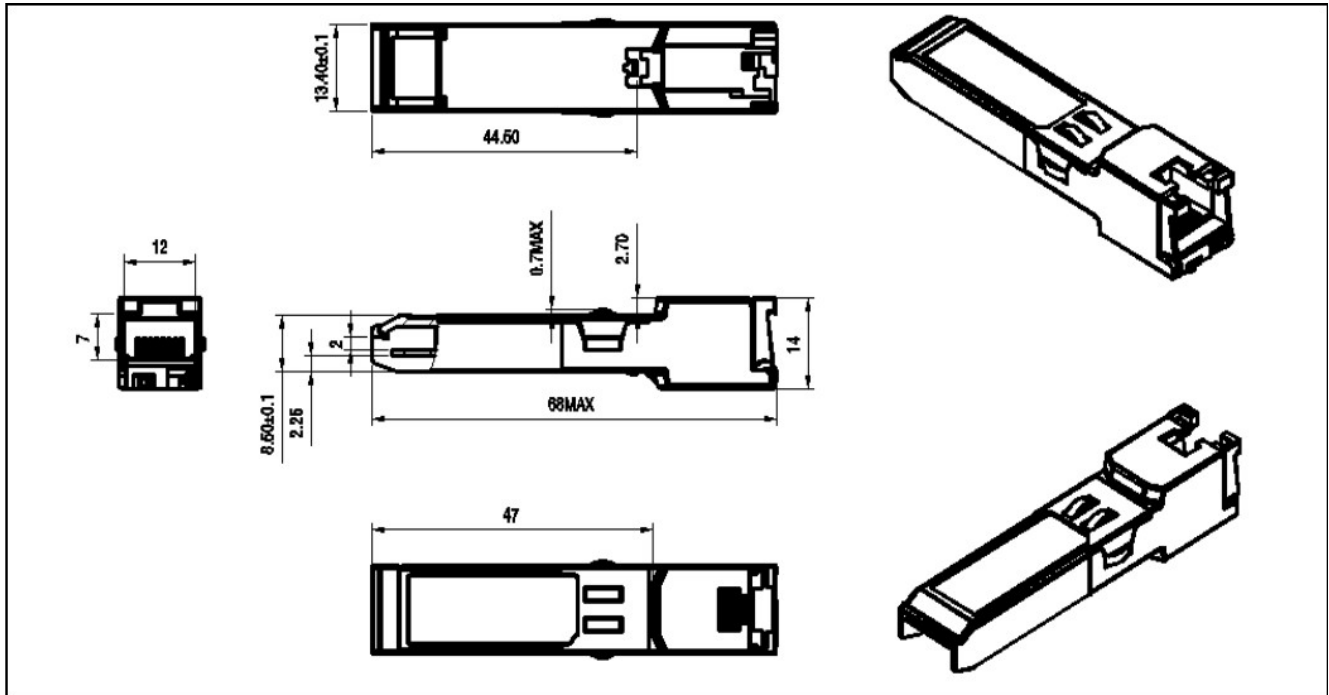
All Carelink SFPs support the 2-wire serial communication protocol outlined in the SFP MSA. These SFPs use an Atmel AT24C02B 128 byte EEPROM with an address of A0h. The 1000BASE-T physical layer IC can also be accessed via the 2-wire serial bus at address ACh. For details interfacing with the PHY IC, see Marvell data sheet titled "Alaska Ultra 88E1111 Integrated Gigabit Ethernet Transceiver" (Marvell document number MV-S100649-00).

| Serial Bus Timing Requirements | | | | | | |
|--------------------------------|--------|-----|-----|---------|------|------------------|
| Parameter | Symbol | Min | Typ | Max | unit | Notes/Conditions |
| I ² C Clock Rate | | 0 | | 100,000 | Hz | |



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VIII. Mechanical Specifications (Unit:mm)



Eye Safety Mark

The SFP series multimode transceiver is a class 1 laser product. It complies with EN 60825-1 and FDA 21 CFR 1040.10 and 1040.11. In order to meet laser safety requirements the transceiver shall be operated within the Absolute Maximum Ratings.

Caution

All adjustments have been done at the factory before the shipment of the devices. No maintenance and user serviceable part is required. Tampering with and modifying the performance of the device will result in voided product warranty.

Required Mark

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

Note : All information contained in this document is subject to change without notice.