

## 10/100BASE-T Copper SFP Transceiver

### SFP-100BASE-Tx

#### 1.PRODUCT FEATURES

- Support 10base-T / 100base-Tx
- Hot-pluggable SFP footprint
- Compact RJ-45 connector assembly
- RoHS compliant and lead-free
- Single +3.3V power supply
- 10/100base-Tx Fast Ethernet over Cat 5 cable
- Ambient Operating temperature: -40°C to +85°C



#### 2.PRODUCT DESCRIPTION

SFP-100BASE-Tx Copper Small Form Pluggable (SFP) transceivers are based on the SFP Multi Source Agreement (MSA) . They are compatible with the 10base-T / 100base-Tx standards as specified in IEEE Std 802.3 . SFP-100BASE-T uses the SFP's RX\_LOS pin for link indication. If pull up SFP's TX\_DISABLE pin, SWITCH IC be reset.

#### 3. Cable Length

| Line Side  | Cable | Reach | Host Interface |
|------------|-------|-------|----------------|
| 10base-T   | CAT5  | 200m  | 100base-FX     |
| 100base-Tx | CAT5  | 100m  | 100base-FX     |

## 4.SFP to Host Connector Pin Out

| Pin | Symbol      | Name/Description  | Ref. |
|-----|-------------|---|------|
| 1   | VEET        | Transmitter Ground (Common with Receiver Ground)            | 1    |
| 2   | TFAULT      | Transmitter Fault. Not supported.                           |      |
| 3   | TDIS        | 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         | High indicates no linked. low indicates linked.             | 4    |
| 9   | VEER        | Receiver Ground (Common with Transmitter Ground)            | 1    |
| 10  | VEER        | Receiver Ground (Common with Transmitter Ground)            | 1    |
| 11  | VEER        | 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  | VEER        | Receiver Ground (Common with Transmitter Ground)            | 1    |
| 15  | VCCR        | Receiver Power Supply                                       |      |
| 16  | VCCT        | Transmitter Power Supply                                    |      |
| 17  | VEET        | 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  | VEET        | Transmitter Ground (Common with Receiver Ground)            | 1    |

### Notes:

1. Circuit ground is connected to chassis ground
2. PHY disabled on  $T_{DIS} > 2.0V$  or open, enabled on  $T_{DIS} < 0.8V$
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.
4. LVTTTL compatible with a maximum voltage of 2.5V.

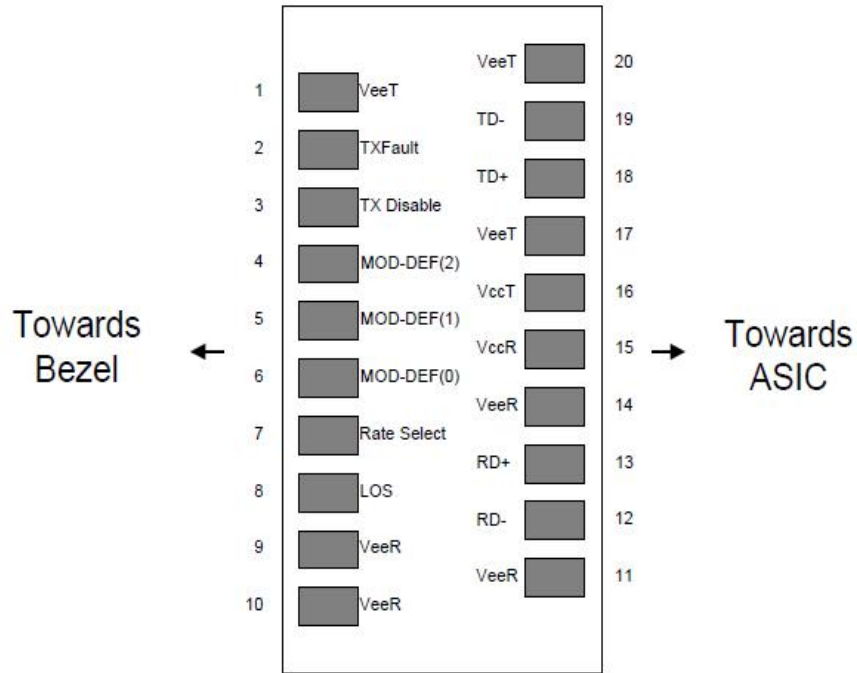


Figure 1. Diagram of host board connector block pin numbers and names

## 5. +3.3V Volt Electrical Power Interface

The SFP-100BASE-Tx has 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     |      | -   | 300  | mA   | 1.0W 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 |      | TBD |      | 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

## 6. 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       |  |

## 7.High-Speed Electrical Interface

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                          | Vinsing                        | 250 |     | 1200 | mV   | Single ended  |
| Single ended data output swing                         | Voutsing                       | 350 |     | 800  | mV   | Single ended  |
| Rise/Fall Time   | T <sub>r</sub> ,T <sub>f</sub> |     | -   |      | psec | 20%-80%   |
| Tx Input Impedance                                     | Zin                            |     | 50  |      | Ohm  | Single ended  |
| Rx Output Impedance                                    | Zout                           |     | 50  |      | Ohm  | Single ended  |

## 8.General Specifications

| General   |        |     |     |     |        |   |
|-----------|--------|-----|-----|-----|--------|---|
| Parameter | Symbol | Min | Typ | Max | unit   | Notes/Conditions                              |
| Data Rate | BR     | 10  |     | 100 | Mb/sec | IEEE 802.3 compatible.<br>See Notes 1,2 below |

**Notes:**

1. Clock tolerance is +/- 50 ppm

## 9.Environmental Specifications

Automatic crossover detection is enabled. External crossover cable is not required

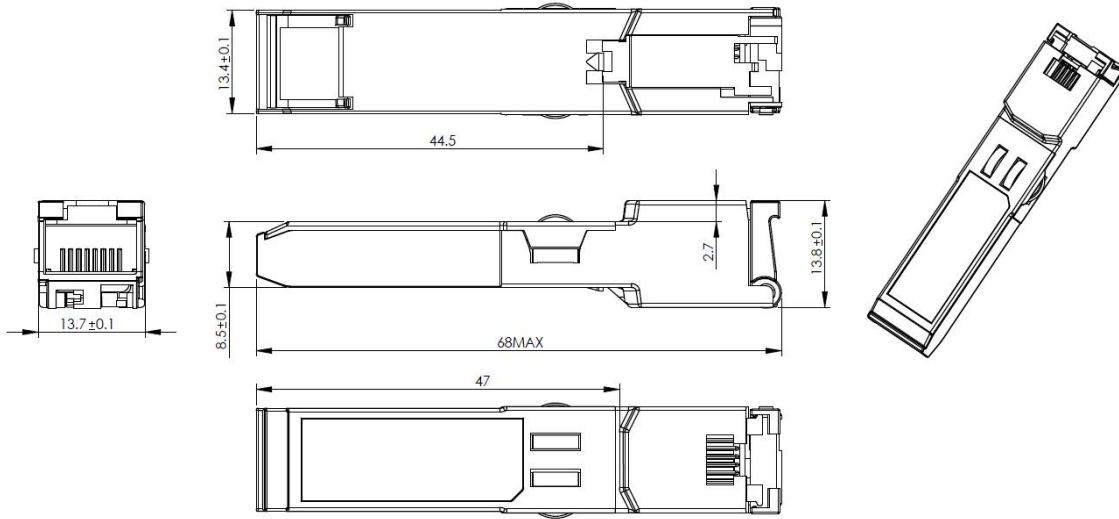
| ENVIRONMENT SPECIFICATION |        |     |     |     |      |                     |
|---------------------------|--------|-----|-----|-----|------|---------------------|
| Parameter                 | Symbol | Min | Typ | Max | unit | Notes/Conditions    |
| Operating Temperature     | Top    | -40 |     | 85  | °C   | Case temperature    |
| Storage Temperature       | Tsto   | -40 |     | 85  | °C   | Ambient temperature |

## 10. Serial Communication Protocol

All WINTOP SFPs support the 2-wire serial communication protocol outlined in the SFP MSA. These SFPs use an MCU, can be accessed with address of A0h.

| Serial Bus Timing, Requirements |        |     |     |         |      |                  |
|---------------------------------|--------|-----|-----|---------|------|------------------|
| Parameter                       | Symbol | Min | Typ | Max     | unit | Notes/Conditions |
| I <sup>2</sup> C Clock Rate     |        | 0   |     | 200,000 | Hz   |                  |

## 11. Mechanical Specifications (Unit:mm)



## 12. Ordering information

| Part Number | Description                              |
|-------------|--|
| OT-SFP-FE-T | 10/100Mbps, Copper SFP with spring latch |

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