

PRODUCT FEATURES

- 100% Cisco Compatible MGBT1
- Up to 1.25 Gb/s bi-directional data links
- Hot-pluggable SFP transceiver module
- 1000BASE-T Copper
- Gigabit Ethernet over Cat5 Cable
- Low power dissipation (1.05W typical)
- Compact RJ-45 connector assembly
- Access to physical layer IC via 2-wire serial bus
- Up to 100m transmission distance
- 1000BASE-T operation in host systems with SERDES interface
- 10/100/1000Mbps compliant in host systems with SGMII interface
- Commercial temperature range (0°C to +70°C)



GENERAL

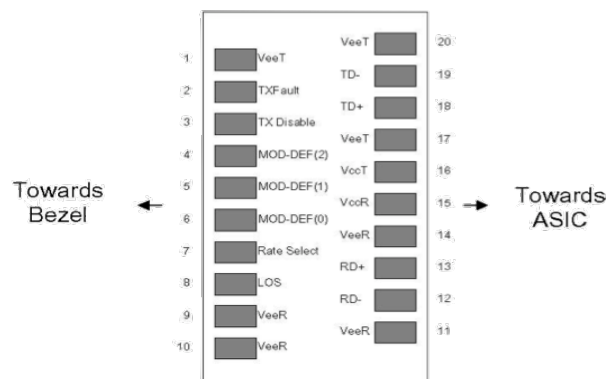
MGBT1-HPC Copper Small Form Pluggable (SFP) transceivers are a high performance, cost effective module compliant with the Gigabit Ethernet and 1000- BASE-T standards as specified in IEEE 802. 3-2002 and IEEE 802.3ab, which supporting 1000Mbps data- rate up to 100 meters reach over unshielded twisted-pair CAT 5 cable. The Cisco compatible SFPs support 1000 Mbps (or 10/100/1000Mbps) full duplex data-links with a 100m reach over unshielded twisted-pair CAT 5 cable. The module provides standard serial ID information compliant with SFP MSA, which can be accessed with address of A0h via the 2wire serial CMOS EEPROM protocol.

PIN DESCRIPTIONS

| Pin | Symbol | Name/Description | Ref. |
|-----|-------------|---|------|
| 1 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |
| 2 | TX Fault | Transmitter Fault. Not Supported | |
| 3 | TX Disable | Transmitter Disable. PHY 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 | Loss of Signal indication | 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 | Transceiver Ground (Common with Transmitter Ground) | 1 |
| 18 | TD+ | Transceiver 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 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.
4. LVTTTL compatible with a maximum voltage of 2.5V. Not supported on GE-GB-P.



Pin-out of Connector Block on Host Board

+3.3 Volt Electrical Power Interface

The GE-GB-P has an input voltage range of 3.3 V +/- 5%. The 4 V maximum voltage is not allowed for continuous operation.

| +3.3 Volt Electrical Power Interface | | | | | | |
|--------------------------------------|--------|------|-----|------|------|---|
| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
| Supply Current | Is | | 320 | 375 | mA | 1.2W max power over full range of voltage and temperature |
| 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 able steady state current |

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 |
| 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 |

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 |
| 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 125 MHz |
| Rx Input Impedance | Zin,RX | - | 100 | - | Ohm | Differential, for all Frequencies between 1MHz and 125 MHz |

High-Speed Electrical Interface

| High-Speed Electrical Interface, Host-SFP | | | | | | |
|---|----------|-----|-----|------|------|--------------|
| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
| 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 | Tr,Tf | - | 175 | - | psec | 20% - 80% |
| Tx Input Impedance | Zin | - | 50 | - | Ohm | Single ended |
| Rx Output Impedance | Zout | - | 50 | - | Ohm | Single ended |

General Specifications

| MGBT1-HPC General Specifications | | | | | | |
|----------------------------------|--------|-----|-----|-------|--------|--|
| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
| Data Rate | BR | 10 | - | 1,000 | Mb/sec | IEEE 802.3 compatible. See Notes 2 through 4 below |
| Cable Length | L | - | - | 100 | m | Category 5 UTP. BER <10 ⁻¹² |

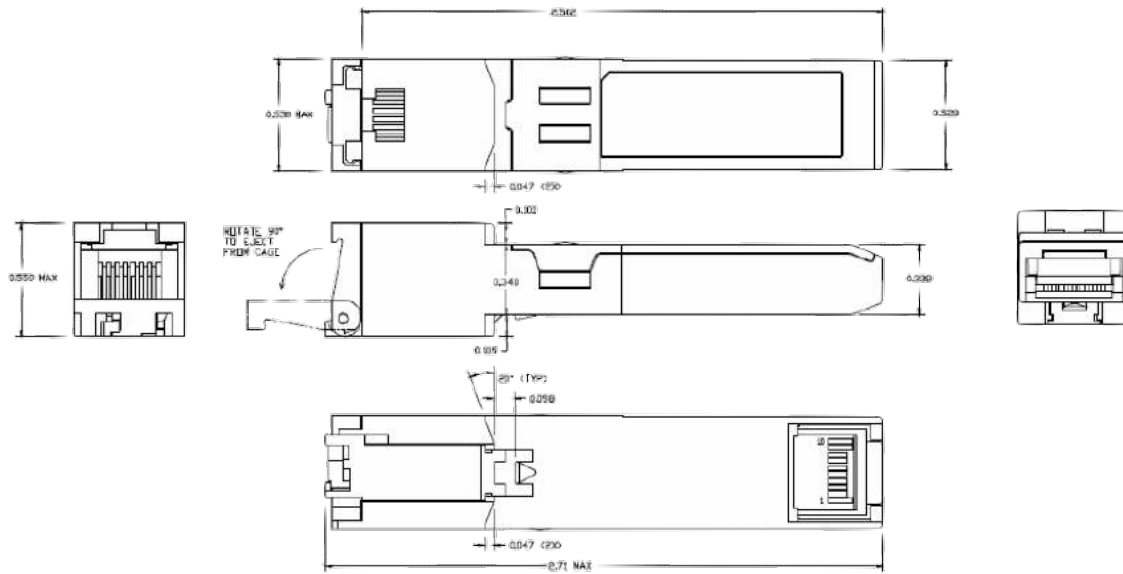
Notes:

1. Clock tolerance is +/- 50 ppm
2. By default, the GE-GB-P is a full duplex device in preferred master mode
3. Automatic crossover detection is enabled. External crossover cable is not required
4. 1000 BASE-T operation requires the host system to have an SGMII interface with no clocks, and the module PHY to be configured per Application Note AN-2036. With a SERDES that does not support SGMII, the module will operate at 1000BASE-T only.

Environmental Specifications

| Temperature Specifications | | | | | | |
|----------------------------|--------|-----|-----|-----|------|---------------------|
| Parameter | Symbol | Min | Typ | Max | Unit | Notes |
| Operating Temperature | Top | 0 | - | 85 | °C | Case temperature |
| Storage Temperature | Tsto | -40 | - | 85 | °C | Ambient temperature |

Mechanical Specifications



MGBT1-HPC Mechanical Dimensions

Ordering Information

| Part Number | Product Description |
|-------------|--|
| MGBT1-HPC | Cisco Compatible 1000BASE-T Copper SFP Transceiver |