

MGBT1-LEG
LINKSYS 1000BASE-TX SFP
COPPER 100M REACH RJ-45



MGBT1-LEG

1.25Gbps SFP Copper Transceiver

Features

- Up to 1.25Gb/s bi-directional data links
- Hot-pluggable SFP footprint
- Extended case temperature range (0°C to +85°C)
- Fully metallic enclosure for low EMI
- Low power dissipation (1.05 W typical)
- Compact RJ-45 connector assembly
- Access to physical layer IC via 2-wire serial bus
- 1000Base-TX operation in host systems with SERDES interface
- 10/100/1000Mbps compliant in host systems with SGMII interface

Product Description

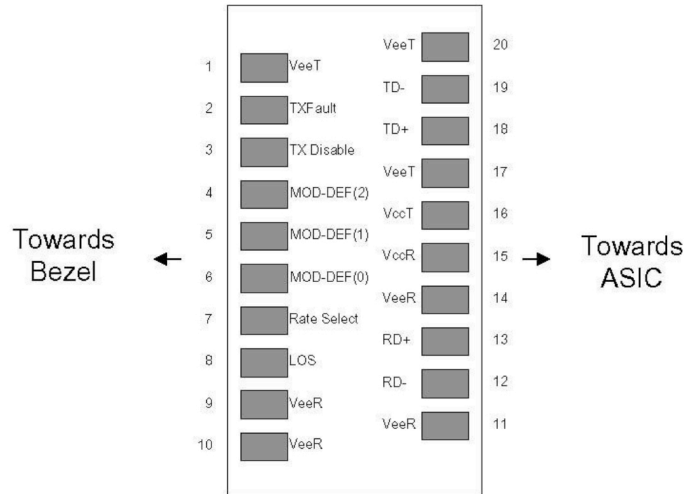
Legrand's MGBT1-LEG, Copper Small Form Pluggable (SFP) transceiver is a high performance, cost effective module compliant with the Gigabit Ethernet and 1000- BASE-T standards as specified in IEEE 802. 3-2002 and IEEE 802.3ab, which supporting 1000Mbps data- rate up to 100 meters reach over unshielded twisted-pair CAT 5 cable. The module supports 1000 Mbps (or 10/100/1000Mbps) full duplex data-links with 5-level Pulse Amplitude Modulation (PAM) signals. All four pairs in the cable are used with symbol rate at 250Mbps on each pair. 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. The physical IC can also be accessed via 2wire serial bus at address ACh.

Pin Descriptions

| Pin | Symbol | Name/Descriptions | Ref. |
|-----|-------------|--|------|
| 1 | VeeT | Transmitter Ground (Common with Receiver Ground). | 1 |
| 2 | TX Fault | Transmitter Fault. Not Supported | |
| 3 | TDIS | Transmitter Disabled. 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 | 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 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 2.0V and 3.6V. 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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|-----------------|--------|------|------|------|------|-------|
| Supply Current | Is | | 320 | 375 | mA | 1 |
| Input Voltage | Vcc | 3.13 | 3.3 | 3.47 | V | 2 |
| Maximum Voltage | Vmax | | | 4 | V | |
| Surge Current | Isurge | | | 30 | mA | 3 |

Notes:

1. 1.2W max power over full range of voltage and temperature. Power consumption and surge current are higher than the specified values in SFP MSA.
2. Referenced to GND
3. Hot plug above steady state current. Power consumption and surge current are higher than the specified values in SFP MSA.

Low-Speed Signals

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|-----------------|--------|--------------|------|--------------|------|-------|
| SFP Output LOW | VOL | 0 | | 0.5 | V | 1 |
| SFP Output High | VOH | Host_Vcc-0.5 | | Host_Vcc+0.3 | V | 1 |
| SFP Input LOW | VIL | 0 | | 0.8 | V | 2 |
| SFP Input HIGH | VIH | 2 | | Vcc+0.3 | V | 2 |

Notes:

1. 4.7k to 10k pull-up to Host_Vcc, measured at host side of connector
2. 4.7k to 10k pull-up to Vcc, measured at SFP side of connector

High-Speed Signals

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|--------------------------------|----------|------|------|------|------|-------|
| Transmission Line-SFP | | | | | | |
| Line Frequency | fL | | 125 | | MHz | 1 |
| TX Output impedance | Zout, TX | | 100 | | Ohm | 2 |
| Rx Input Impedance | Zin, RX | | 100 | | Ohm | 2 |
| Host-SFP | | | | | | |
| Single ended data input swing | Vinsing | 250 | | 1200 | mV | 3 |
| Single ended data output swing | Voutsing | 350 | | 800 | mV | 3 |
| Rise/Fall Time | Tr,Tf | | 175 | | Psec | 4 |
| Tx Input Impedance | Zin | | 50 | | Ohm | 3 |
| Rx Output Impedance | Zout | | 50 | | Ohm | 3 |

Notes:

1. 5-level encoding, per IEEE 802.3
2. Differential, for all Frequencies between 1MHz and 125MHz
3. Single ended
4. 20%-80%

General Specifications

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|--------------------|--------|------|------|------|--------|-------|
| Data Rate | BR | 10 | | 1000 | Mb/sec | 1,4-6 |
| Distance Supported | L | | | 100 | m | 2 |

Notes:

1. IEEE 802.3 compatible
2. Category 5 UTP. BER <10⁻¹²
3. Clock tolerance is +/- 50 ppm
4. By default, the GE-GB-P is a full duplex device in preferred master mode
5. Automatic crossover detection is enabled. External crossover cable is not required
6. 1000Base-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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Notes |
|-----------------------|--------|------|------|------|------|-------|
| Operating Temperature | Top | 0 | | 85 | °C | |
| Storage Temperature | Tsto | -40 | | 85 | °C | |

Mechanical Specifications

