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.

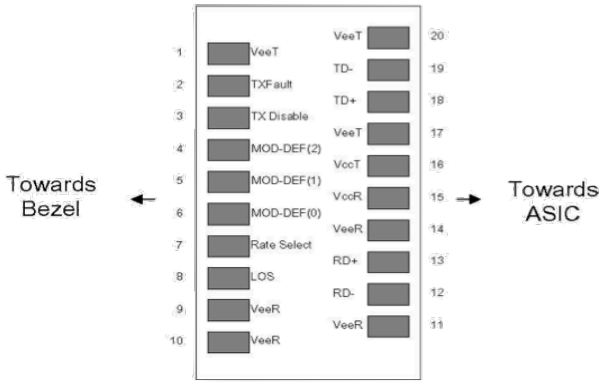
HPC Optics
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PIN DESCRIPTIONS

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. LVTTL 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

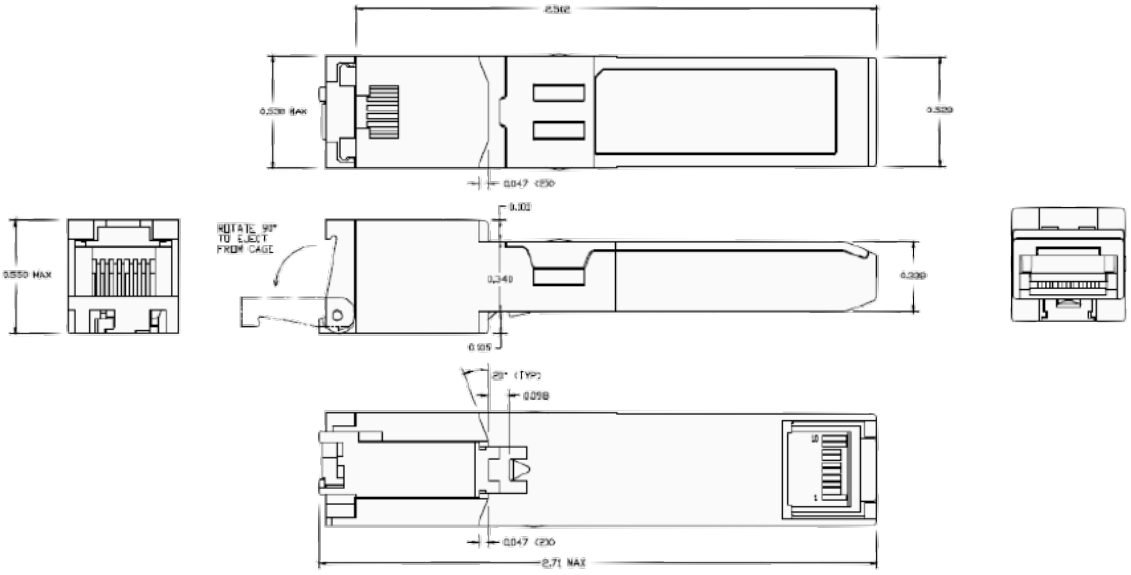
Notes:

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