PRODUCT FEATURES

- 100% Cisco Meraki Compatible MA-SFP-1GB-TX
- 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

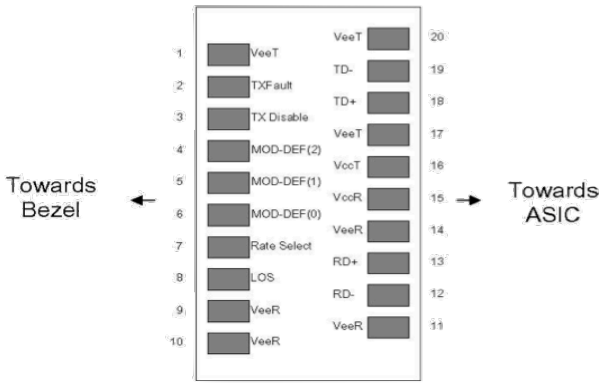
MA-SFP-1GB-TX-HPC Copper Small Form Pluggable (SFP) transceivers are a high performance, cost effective module compliant with the Gigabit Ethernet and 1000- BASE-T standards as specified in IEEE 802. 3-2002 and IEEE 802.3ab, which supporting 1000Mbps data- rate up to 100 meters reach over unshielded twisted-pair CAT 5 cable. The Meraki 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. 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

MA-SFP-1GB-TX-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

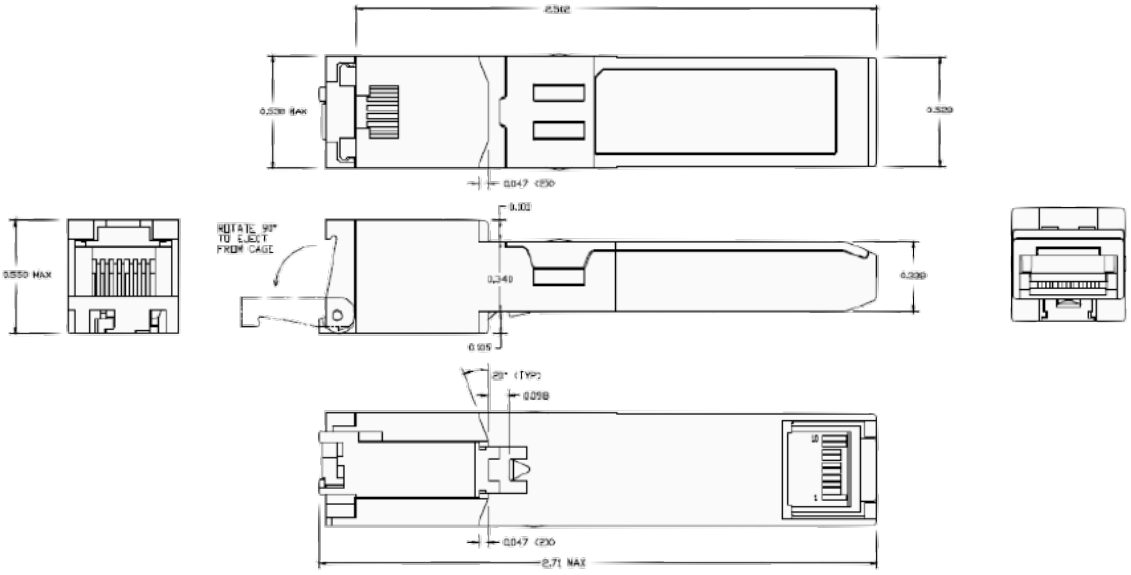
Notes:

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



MA-SFP-1GB-TX-HPC Mechanical Dimensions

Ordering Information

Part Number	Product Description
MA-SFP-1GB-TX-HPC	Meraki Compatible 1000BASE-T Copper SFP Transceiver