

## SFP-100M-1G-TX

## TransOpto

### SFP-100M-1G-TX 1000Base-T Copper SFP Transceiver

#### DESCRIPTIONS

SFP-GEM-TC Copper Small Form Pluggable (SFP) transceivers are high performance, cost effective module compliant with the Gigabit Ethernet and 1000BASE-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 category 5 cables. The module supports 1000 Mbps 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 EEPROM protocol. The physical IC can also be accessed via 2wire serial bus at address A0h.



#### FEATURES

- Up to 1.25Gb/s bi-directional data links
- Hot-pluggable SFP footprint
- Extended case temperature range
- Fully metallic enclosure for low EMI
- Low power dissipation
- Compact RJ-45 connector assembly
- Access to physical layer IC via 2-wire serial bus

- 1000 BASE-T operation in host systems with SERDES interface
- 10/100/1000Mbps compliant in host systems with SGMII interface

#### APPLICATIONS

- 1.25 Gigabit Ethernet over Cat 5 cable

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### ELECTRICAL POWER INTERFACE

The SFP-GEM-TC has an input voltage range of +3.3V +/- 5%. The 3.3V maximum voltage is not allowed for continuous operation.

#### +3.3V Volt electrical power interface

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes/Conditions
Supply Current	Is		320	375	mA	1.2W 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			30	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 GBIC MSA

### 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.	Units	Notes/Conditions
GBIC Output LOW	VOL	0	0.5	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
GBIC 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
GBIC Input LOW	VIL	0	0.8	V	4.7k to 10k pull-up to Vcc, measured at GBIC side of connector
GBIC Input HIGH	VOH	2	Vcc + 0.3	V	4.7k to 10k pull-up to Vcc, measured at GBIC side of connector

## HIGH-SPEED ELECTRICAL INTERFACE

All high-speed signals are AC-coupled internally.

### High-speed electrical interface, transmission line-GBIC

Parameter	Symbol	Min.	Typ.	Max.	Units	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-GBIC

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes/Conditions
Single ended data input swing	Vinsing	250		1200	mV	Single ended
Single ended data output swing	Voutsing	350		800	mV	Single ended
Rase/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

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes/Conditions
Date 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

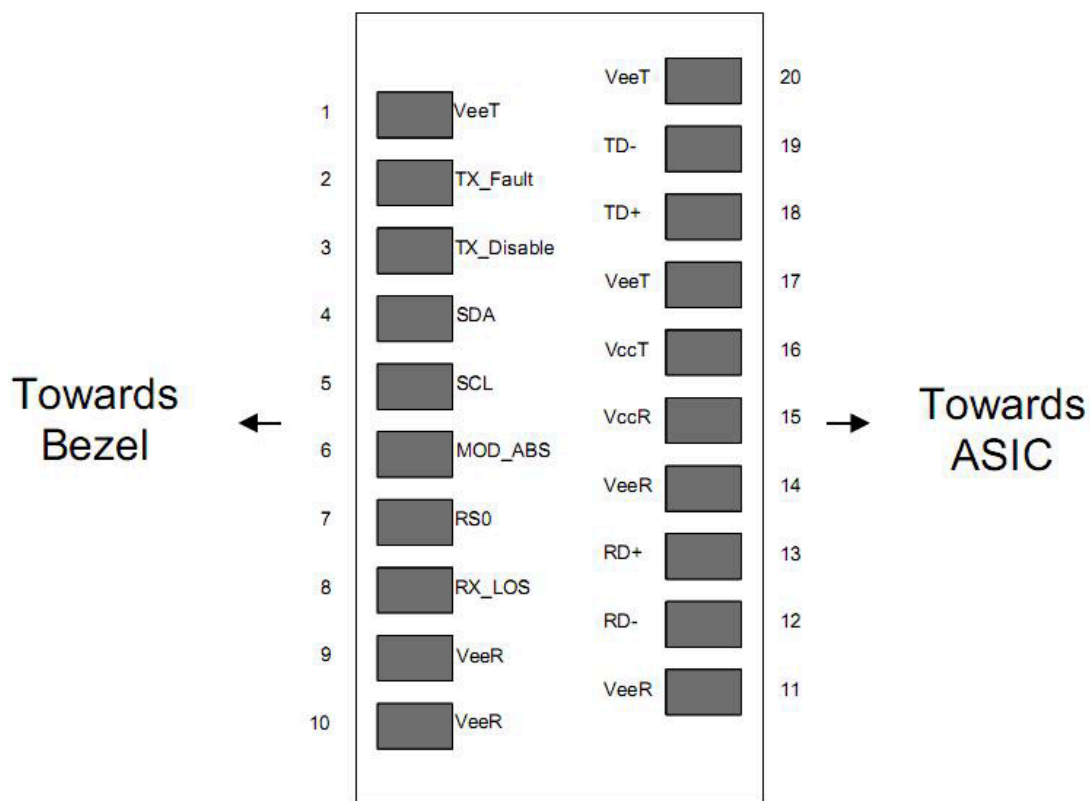
### Notes:

1. Clock tolerance is +/- 50 ppm
2. By default, the module 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

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes/Conditions
Operating Temperature	Top	0		70	°C	Case temperature
	Top	-40		85	°C	Case temperature
Storage Temperature	Tsto	-40		85	°C	Ambient temperature

## PIN DESCRIPTION

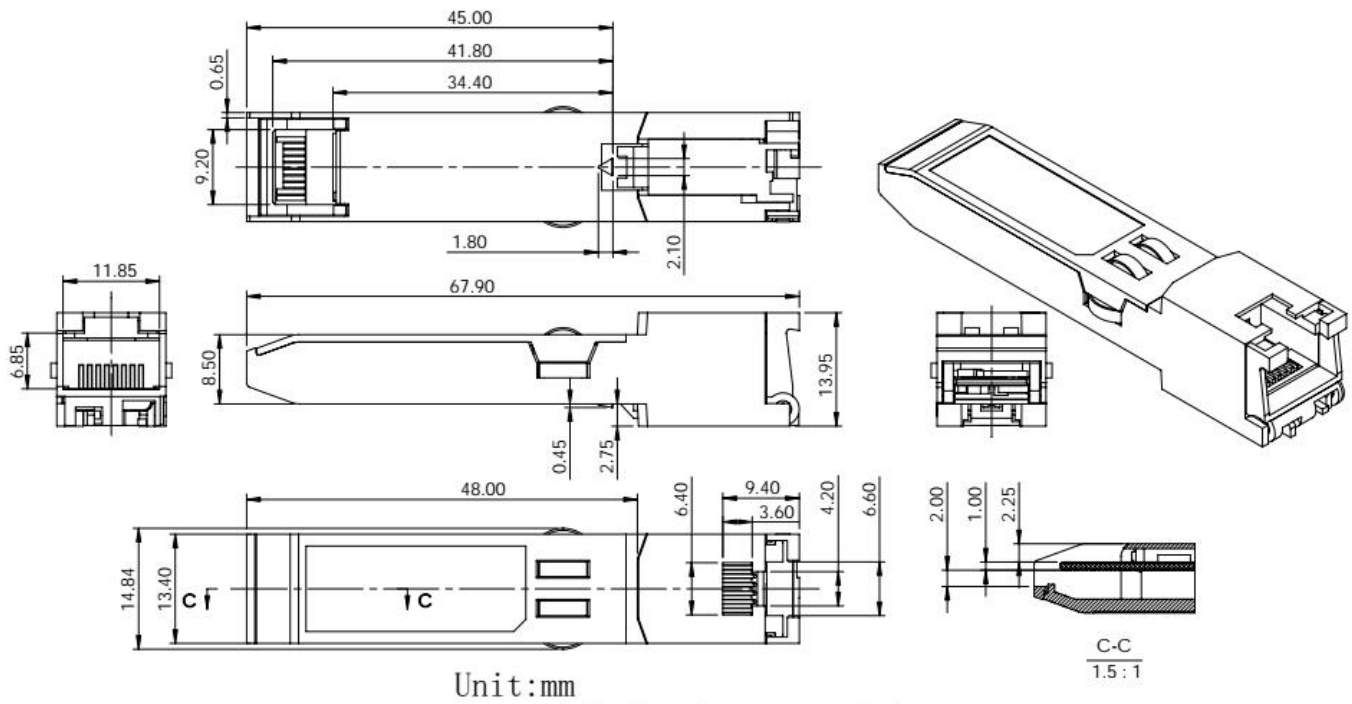


Pin	Signal name	Description	Plug seq.	Notes
1	V EET	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Not supported
3	TX DISABLE	Transmitter Disable	3	
4	SDA	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD_ABS	Module Absent. Grounded within the module	3	
7	RS0	Not Connected	3	
8	LOS	Loss of Signal	3	Not supported
9	V EER	Receiver ground	1	
10	V EER	Receiver ground	1	
11	V EER	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	
13	RD+	Received Data Out	3	
14	V EER	Receiver ground	1	
15	V CCR	Receiver Power Supply	2	
16	V CCT	Transmitter Power Supply	2	
17	V EET	Transmitter Ground	1	
18	TD+	Transmit Data In	3	
19	TD-	Inv- Transmit Data In	3	
20	V EET	Transmitter Ground	1	

## REFERENCES

1. Gigabit Interface Converter (GBIC) Transceiver Multi-Source Agreement (MSA),
2. IEEE Std 802.3, 2002 Edition. IEEE Standards Department, 2002.
3. "AT24C01A/02/04/08/16 2-Wire Serial EEPROM", Atmel Corporation.
4. "Alaska Ultra 88E1111 Integrated 10/100/1000 Gigabit Ethernet Transceiver", Marvell Corporation.

## MECHANICAL SPECIFICATIONS



## ORDERING INFORMATION

### Part Number

SFP-100M-1G-TX

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ALCADON AB  
Sweden  
alcadon.se  
+46 8 657 36 00

ALCADON AS  
Norway  
alcadon.no  
+47 23 17 78 80

ALCADON APS  
Denmark  
alcadon.dk  
+45 45 70 70 77

ALCADON GMBH  
Germany  
alcadon.de  
+49 431 36 30 40 34

ALCADON BV  
Belgium  
alcadon.be  
+32 3 326 26 03