
SGED1-NAC-T1

Features

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

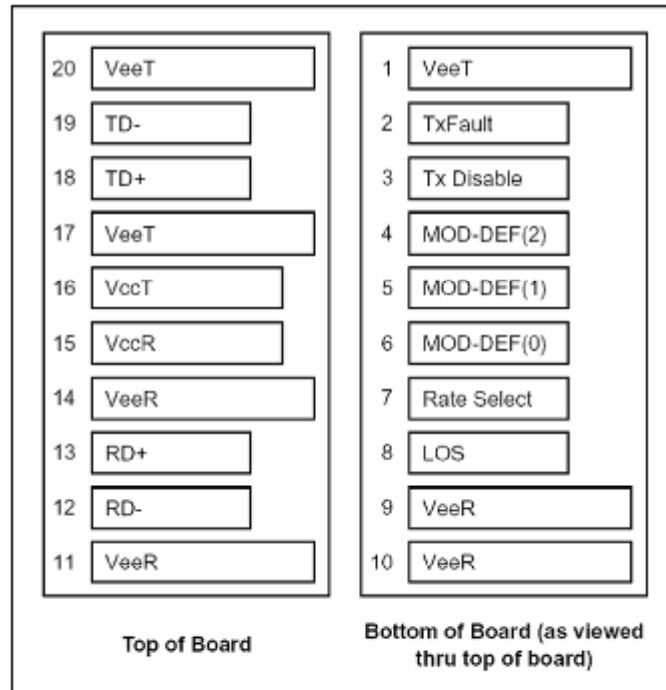
Application

- u 1.25 Gigabit Ethernet over Cat 5 cable

Description

SGED1-NAC-T1 Copper Small Form Pluggable (SFP) transceiver module is high performance, cost effective module compliant with the Gigabit Ethernet and 1000BASE-T standards as specified in IEEE 802.3, which supporting 1000Mbps data-rate up to 100 meters reach over unshielded twisted-pair category 5 cable. 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 CMOS EEPROM protocol. The physical IC can also be accessed via 2wire serial bus at address ACh.

Pin Description



As Viewed Through Top of Board

Pin	Name	Function/Description	Engage-ment	Order
1	VEET	Transmitter Ground	1	
2	TX FAULT	Not supported	3	Note 1
3	TX DISABLE	PHY disabled on high or open	3	Note 2
4	MOD_DEF(2)	SDA Serial Data Signal	3	Note 3
5	MOD_DEF(1)	SCL Serial Clock Signal	3	Note 3
6	MOD_DEF(0)	Connected to ground	3	
7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	Note 4
9	VEER	Receiver ground	1	
10	VEER	Receiver ground	1	
11	VEER	Receiver ground	1	
12	RX-	Inv. Received Data Out	3	Note 5
13	RX+	Received Data Out	3	Note 5
14	VEER	Receiver ground	1	
15	VCCR	Receiver Power Supply	2	
16	VCCT	Transmitter Power Supply	2	

17	VEET	Transmitter Ground	1	
18	TX+	Transmit Data In	3	Note 6
19	TX-	Inv. Transmit Data In	3	Note 6
10	VEET	Transmitter Ground	1	

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

- 1) TX Fault is connected to ground.
- 2) The TX Disable is an CLOCK input if the SGED1-NAC-T1 choice external clock. And The TX Disable is non-connect when the SGED1-NAC-T1 choice internal clock.
- 3) Mod-Def 0,1,2. These are the module definition pins.
 Mod-Def 0 is Connected to ground
 Mod-Def 1 is the clock line of two wire serial interface for serial ID
 Mod-Def 2 is the data line of two wire serial interface for serial ID
- 4) The communication is connected when the los is low, The communication is non-connected when the los is high.
- 5) RD-/+: These are the differential receiver outputs. They are AC-coupled, differential lines with 100 differential termination inside the module.
- 6) TD-/+: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 differential termination inside the module.

Digital Diagnostic Memory Map

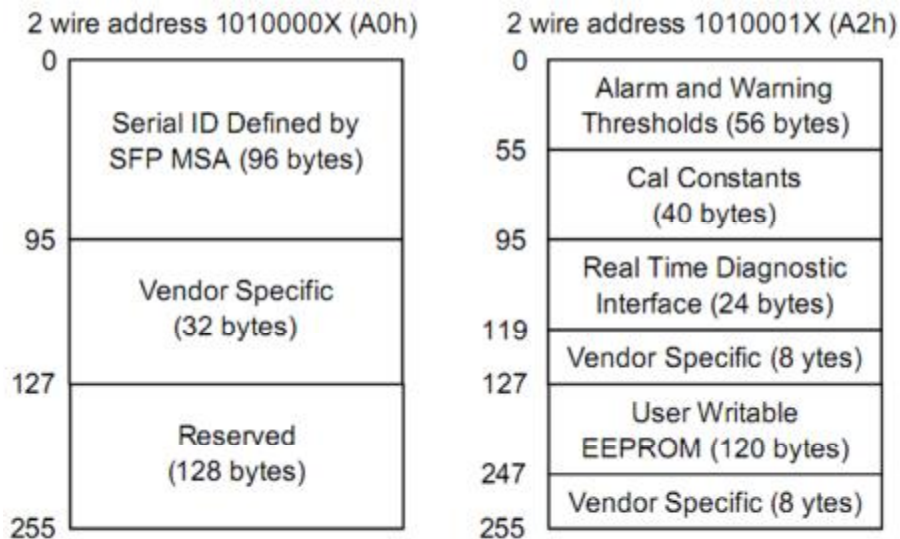


Figure1

Digital Diagnostic Monitoring Information

Parameter	Range	Accuracy	Calibration
Temperature	0 to 85°C	±3°C	Internal
Voltage	3.0 to 3.6V	±3%	Internal

Environmental specifications

Table 1. Environmental Specifications

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

+3.3V Volt Electrical Power Interface

Table 2. +3.3V Volt electrical power interface

+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 SFP 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.

Table 3. Low-speed signals, electronic characteristics

Low-Speed Signals, Electronic Characteristics					
Parameter	Symbol	Min	Max	Units	Notes/Conditions
SFP Output LOW	VOL	0	320	mV	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.

Table 4. High-speed electrical interface, transmission line-SFP

High-Speed Electrical Interface Transmission Line-SFP					
Parameter	Symbol	Min	Max	Units	Notes/Conditions
Line Frequency	fL		125	MHz	5-level encoding, per IEEE
Tx Output Impedance	Zout,T X		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-SFP

Table 5. High-speed electrical interface, host-SFP

High-Speed Electrical Interface, Host-SFP						
Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Single ended data input swing	Vinsing	250		1200	Mv	Single ended
Single ended data output swing	Voutsin g	350		800	mv	Single ended
Rise/Fall Time	Tr,Tf		175		mv	20%-80%
Tx Input Impedance	Zin		50		Ohm	Single ended
Rx Output Impedance	Zin		50		Ohm	Single ended

General Specifications

Table 6. General specifications

General						
Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Data Rate	BR	10		1000	Mb/sec	IEEE802.3u
Cable Length	L			100	m	Category 5 UTP. BER <10-12

Notes:

1. Clock tolerance is +/- 50 ppm
2. the SGED1-NAC-T1 is a full duplex device in preferred master mode
3. Automatic crossover detection is enabled. External crossover cable is not required

Mechanical Specifications

The host-side of the SGED1-NAC-T1 conforms to the mechanical specifications outlined in the SFP MSA1. The front portion of the SFP (part extending beyond the face plate of the host) is larger to accommodate the RJ-45 connector.

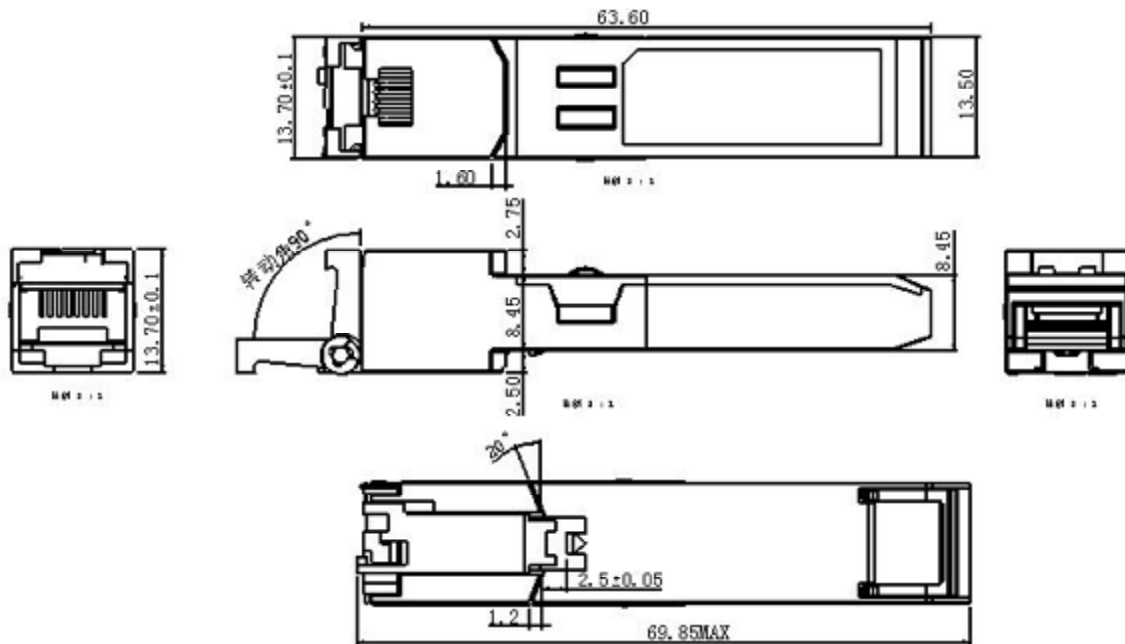


Figure 2. SGED1-NAC-T1 mechanical dimensions