

**Alpha Bridge
ASFP-1G-T-I
Datasheet**



Features

- Up to 1.25Gb/s bi-directional data links
- Hot-pluggable SFP footprint
- Extended case temperature range commercial (0°C to +70°C), industrial (-40°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-T operation in host systems with SERDES interface
- 10/100/1000Mbps compliant in host systems with SGMII interface

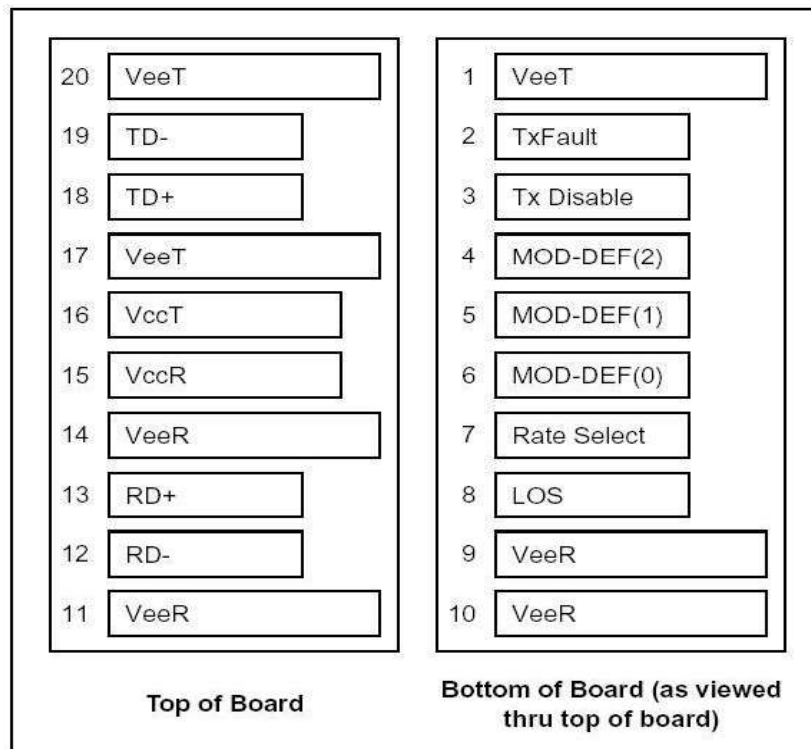
Applications

- 1.25 Gigabit Ethernet over Cat cable

Description

The Copper Small Form Pluggable (SFP)transceivers is high performance, cost-effective module compliant with the Gigabit Ethernet and 1000BASE-T standards as specified in IEEE 802. 3-2002 and IEEE802.3ab, which supporting 1000Mbps data- rate up to 100 meters reach over unshielded twisted-pair category cable. The module supports 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 A0h.

Pin Definitions



Pin Descriptions

Pin	Signal Name	Description	Plug Seq.	Notes
1	VEET	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note1
3	TX DISABLE	Transmitter Disable	3	Note2
4	MOD_DEF(2)	SDA Serial Data Signal	3	Note3
5	MOD_DEF(1)	SCL Serial Clock Signal	3	Note3
6	MOD_DEF(0)	TTL Low	3	Note3
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
20	VEET	Transmitter Ground	1	

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

- TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
- TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7 "C 10 K resistor. Its states are:

Low (0 to 0.8V):	Transmitter on
(>0.8, < 2.0V):	Undefined
High (2.0 to 3.465V):	Transmitter Disabled
Open:	Transmitter Disabled
- Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K to 10K resistor on the host board. The pull-up voltage shall be VccT or VccR
 Mod-Def 0 is grounded by the module to indicate that the module is present
 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
- LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7K to 10K resistor. Pull up voltage between 2.0V and VccT, R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to <0.8V.
- RD-/+ : These are the differential receiver outputs. They are AC coupled 100 differential lines which should be terminated with 100 (differential) at the user SERDES.
- TD-/+ : These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 differential termination inside the module.

+3.3 Volt Electrical Power Interface

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

Parameter	Symbol	Min	Type	Max	Units	Notes/Conditions
Supply Current	I _s		320	375	mA	1.2W max power over full range of voltage and temperature. See the caution note below
Input Voltage	V _{cc}	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	V _{max}			4	V	
Surge Current	I _{surge}			30	mA	Hot-plug above steady-state current. See the caution note below

Table 1: +3.3 Volt Electrical Power Interface

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_V_{cc}.

Parameter	Symbol	Min	Max	Units	Notes/Conditions
SFP Output LOW	V _{OL}	0	0.5	V	4.7k to 10k pull-up to host_V _{cc} , measured at host side of the connector
SFP Output HIGH	V _{OH}	host_V _{cc} - 0.5	host_V _{cc} + 0.3	V	4.7k to 10k pull-up to host_V _{cc} , measured at host side of connector
SFP Input LOW	V _{IL}	0	0.8	V	4.7k to 10k pull-up to V _{cc} , measured at SFP side of connector
SFP Input HIGH	V _{IH}	2	V _{cc} + 0.3	V	4.7k to 10k pull-up to V _{cc} , measured at SFP side of connector

Table 2: Low-speed signals, electronic characteristics

High-Speed Electrical Interface

All high-speed signals are AC-coupled internally.

Parameter	Symbol	Min	Typ.	Max	Units	Notes/Conditions
Line Frequency	f _L		125		MHz	5-level encoding, per IEEE 802.3
Tx Output Impedance	Z _{out,TX}		100		Ohm	Differential, for all Frequencies between 1MHz and 125MHz
Rx Input Impedance	Z _{in,RX}		100		Ohm	Differential, for all Frequencies between 1MHz and 125MHz

Table 3. High-speed electrical interface, transmission line-SFP

High-speed electrical interface, host-SFP

Parameter	Symbol	Min	Typ.	Max	Units	Notes/Conditions
Single-ended data input swing	V _{insing}	250		1200	mV	Single-ended
Single-ended data output swing	V _{outsing}	350		800	mV	Single-ended
Rise/Fall Time	T _r ,T _f		175		psec	20%-80%
Tx Input Impedance	Z _{in}		50		Ohm	Single-ended
Rx Output Impedance	Z _{out}		50		Ohm	Single-ended

Table 4. High-speed electrical interface, host-SFP

Ordering information

Part Number	Description
ASFP-1G-T-I	10/100/1000Mbps, Copper SFP, RJ45, 100 Meter

Note: All information contained in this document is subject to change without notice.