1.25Gbps Copper SFP Transceiver SFP-T-GFE-PLU / SFP-T-GFE-PLUI*

Features

- Up to 1.25Gbps bi-directional data links
- RJ45 Max100m
- Fully metallic enclosure for low EMI
- Compact RJ-45 Connector assembly
- Hot-pluggable SFP footprint
- Low power dissipation
- Operating temperature: Refer to Ordering Info
- RoHS compliant and Lead Free
- Access to physical layer IC via 2-wire serial bus over Cat 5 cable
- 10/100/1000BASE-T operation in host systems with SGMII interface

Applications

- 1.25 Gigabit Ethernet

Product Description

The SFP-T-GFE-PLU /SFP-T-GFE-PLUI is Copper Small Form pluggable (SFP) transceiver, which is based on SFP multi-sourcing agreement (MSA). They are compatible with the Gigabit Ethernet and 1000BASE-T standards as specified in IEEE Std 802.3. The 1000BASE-T physical layer IC (PHY) can be accessed via I2C,allowing access to all PHY settings and features. The SFP-T-GFE-PLU /SFP-T-GFE-PLUI is compatible with 1000BASE-X auto-negotiation.

*This spec sheet is also for other vendor compatible units with the last 3 digits of the part number varying based on vendor code. Please see the last page of this specification sheet for a list of vendor codes

+3.3V Volt Electrical Power Interf

The SFP-T-GFE-PLU /SFP-T-GFE-PLUI has an input voltage range of 3.3V +/-5%,The 4 V maximun voltage is not allowed for continuous operation.

Parameter	Symbol	Min.	Typ	Max	Units	Notes/Conditions
Supply Current	Is	300	325	345	mA	1.2W max power over full range of voltage and temperature.see caution note below
Power Supply Voltage	Vcc	3.13	3.3	3.47	v	Referebced to GND
Maximum Voltage	Vmax				v	
Surge Current	Isurge			345	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

Table 1.+3.3 Volt electrical power interface

Low-Speed Signals

Parameter	Symbol	Min.	Max	Units	Notes/Conditions
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

Table 2. Low-speed signals,electronic characteristics

High-Speed Electrical Interface

ALL high-speed signals are AC-coupled internally

(1)High-speed Electrical Interface Transmission Line-SFP

Parameter	Symbol	Min.	Typ	Max	Units	Notes/Conditions
Line Frequency	Is	10	125	1000	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

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

(2)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	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

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

General Specifications

Parameter	Symbol	Min.	Typ	Max	Units	Notes/Conditions
Data Rate	BR	10		1000	Mb/sec	IEEE 802.3 compatible.See Notes 2 through 4 below
Tx Output Impedance	L			100	M	Category 5 UTP.BER<10^{-12}

Table 5. General specifications

Note:

1.Clock tolerance is +/- 50 ppm

2.By default, the SFP-T-GFE-PLU /SFP-T-GFE-PLUI is a full duplex device in preferred master mode

3.Automatic crossover detection is enabled.External crossover calble is not required

4.10/100/1000 BASE-T operation requires the host system to have an SGMII interface with no clocks,and the module PHY to be configured per Applications 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 SFP-T-GFE-PLU	Top	0		70	°C	Case temperature
Operating Temperature SFP-T-GFE-PLUI	Top	-40		85	°C	Case temperature
Storage Temperature	Tsto	-40		85	°C	Ambient temperature

Table 6. Environmental specifications

Pin Descriptions

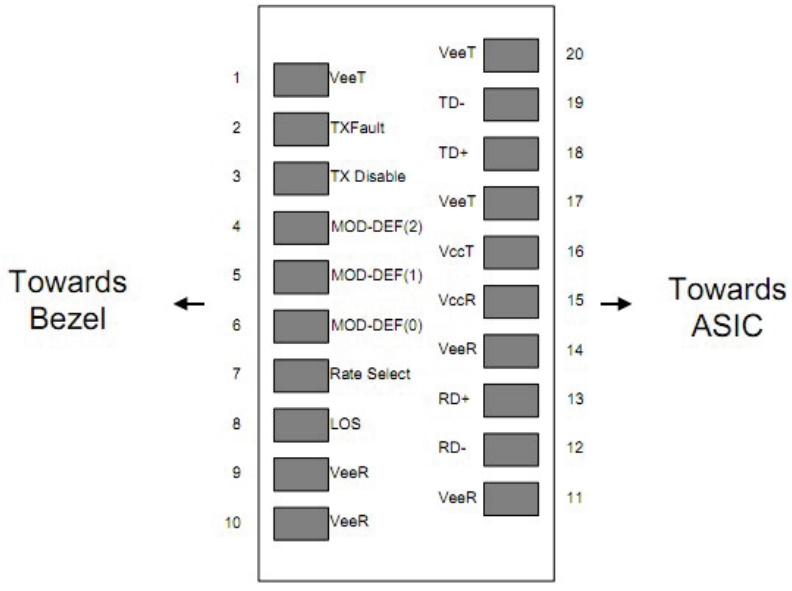


Diagram of Host Board Connector Block Pin Numbers and Names

Pin	Symbol	Description	Ref.
1	VEET	Transmitter Ground (Common with Receiver Ground)	8.1
2	TFAULT	Transmitter Fault. Not supported.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	8.2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	8.3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	8.3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	8.3
7	Rate Select	No connection required	
8	LOS	Grounded	8.4
9	VEER	Receiver Ground (Common with Transmitter Ground)	8.1
10	VEER	Receiver Ground (Common with Transmitter Ground)	8.1
11	VEER	Receiver Ground (Common with Transmitter Ground)	8.1
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)	8.1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	8.1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	8.1

Table 7. SFP to host connector pin assignments and descriptions

Note:
8.1 Circuit ground is connected to chassis ground.
8.2 PHY disabled on TDIS>2.0V or open,enabled on TDIS<0.8V.
8.3 Should be pulled up with 4.7k - 10k Ohms on host board to a voltage between 2.0V and 3.6V.
MOD_DEF(0) pulls line low to indicate module is plugged in.

Serial Communication Protocol

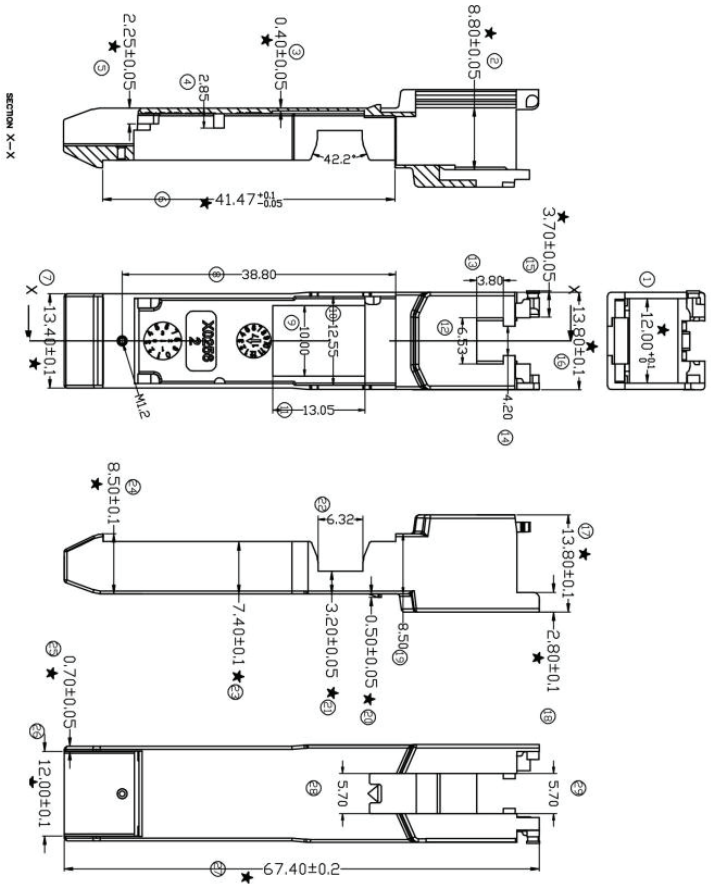
All PLUSOPTIC SFPS support the 2-wire serial communication protocol outlined in the SFP MSA. These SFPS use an Atmel AT24C01A 128 byte E2PROM with an address of A0h. For details on interfacing with the EEPROM,see the Atmel data sheet titled "AT24C01A/02/04/08/16 2-Wire Serial CMOS EEPROM."

The 1000BASE-T physical layer IC can also be accessed via the 2-wire serial bus at address Ach.For details interfacing with the PHY IC,see Marvell data sheet titled "Alaska Ultra 88E1111 Integrated Gigabit Ethernet Transceiver"(Marvell document number MV-S100649-00).

Serial Bus Timing Requirements

Parameter	Symbol	Min.	Typ	Max	Units	Notes/Conditions
IC Clock Rate		0		100000	Hz	

Mechanical Specifications



Custom requirement:

EEPROM

2 wire address 1010000X (A0h)

0~95 Serial ID Defined by SFP MSA (96 bytes)
96~127 Vendor Speific (32 bytes)
128~255 Reserved (128 bytes)

EEPROM Serial ID Memory Contents

Add.	Size (Bytes)	Name of Field	Hex	Description
BASE ID FIELDS				
0	1	Identifier	03	SFP
1	1	Ext. Identifier	04	SFP function is defined by serial ID only
2	1	Connector	22	RJ45 Connector
3-10	8	Transceiver	00 00 00 08 00 00 00 00	Transmitter Code
11	1	Encoding	01	8B/10B
12	1	BR, Nominal	0D	1.25Gbps
13	1	Reserved	00	
14	1	Length (9um) km	00	Transceiver Transmit Distance
15	1	Length (9um) 100m	00	
16	1	Length (50um) 10m	00	
17	1	Length (62.5um) 10m	00	
18	1	Length (Copper)	64	100m
19	1	Reserved	00	
20-35	16	Vendor Name	43 2D 4C 49 47 48 54 20 20 20 20 20 20 20 20 20	Plusoptic * OEM available
36	1	Reserved	00	
37-39	3	Vendor OUI	00 00 00	
40-55	16	Vendor PN	xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	* OEM available

Add.	Size (Bytes)	Name of Field	Hex	Description
56-59	4	Vendor Rev	30 31 20 20	01
60-61	2	Wavelength	00 00	0nm
62	1	Reserved	00	
63	1	CC_BASE	xx	Check Code for Base ID Field
EXTENDED ID FIELDS				
64-65	2	Options	00 00	
66	1	BR, Max	00	
67	1	BR, Min	00	
68-83	16	Vendor SN	43 4C xx xx xx xx xx xx xx xx xx 20 20 20 20	SN of Transceiver (ASCII). Exp. "SPXXXXXXXXXX"
84-91	8	Date Code	xx xx xx xx xx xx 20 20	Exp. 120727
92	1	Diagnostic Monitoring	00	DDM Not implemented
93	1	Enhanced Options	00	Optional flags not implement
94	1	SFF_8472 Compliance	00	Not defined
95	1	CC_EXT	checksum	Checksum for Extened ID
VENDOR SPECIFIC ID FIELDS				
96-127	32	Vendor Specific	20 20 20……	Depends on Customer Info
128-255	128	Reserved	FF FF FF……	Depends on Customer Info

Ordering Information

Part No.	Data Rate	Operating Temp.	Distance	Optical Interface
SFP-T-GFE-PLU	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-PLUI	10/100/1000M	-40°C ~ 85°C	100m	RJ45
SFP-T-GFE-ALCI	10/100/1000M	-40°C ~ 85°C	100m	RJ45
SFP-T-GFE-ALL	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-CIS	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-CISI	10/100/1000M	-40°C ~ 85°C	100m	RJ45
SFP-T-GFE-DEL	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-DELI	10/100/1000M	-40°C ~ 85°C	100m	RJ45
SFP-T-GFE-EXT	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-EXTI	10/100/1000M	-40°C ~ 85°C	100m	RJ45
SFP-T-GFE-FIN	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-FOR	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-H3C	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-HIR	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-HP	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-HUA	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-INTI	10/100/1000M	-40°C ~ 85°C	100m	RJ45
SFP-T-GFE-JUN	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-MEL	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-MELI	10/100/1000M	-40°C ~ 85°C	100m	RJ45
SFP-T-GFE-MER	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-MOX	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-MOXI	10/100/1000M	-40°C ~ 85°C	100m	RJ45
SFP-T-GFE-NOK	10/100/1000M	0°C ~ 70°C	100m	RJ45
SFP-T-GFE-PAL	10/100/1000M	0°C ~ 70°C	100m	RJ45

Ordering Information

When ordering, to choose the vendor you require such as Cisco, HP, Juniper etc you need to replace the 'XXX' at the end of each SKU with the relevant 3 digit vendor code, for instance if you wanted a Cisco Multimode 1.25Gb SFP then the SKU would read SFP-1G-550M-MMD-CIS.

VENDOR	CODE	VENDOR	CODE	VENDOR	CODE	VENDOR	CODE
3com	3CO	Cyan	CYN	Huawei	HUA	PlusOptic	PLU
Adtran	ADT	Compaq	COM	IBM	IBM	Q-logic	QLO
Alcatel-Lucent	ALC	Dell	DEL	Intel	INT	QNA	QNA
Allied Telesis	ATE	Delta	DTA	JDS Uniphase	JDS	RAD	RAD
Allnet	ALL	D-LINK	DLI	Juniper	JUN	Redback	RED
Arista Networks	ARI	EMC	EMC	LNV	LNV	Riverstone	RIV
Aruba Networks	ARU	EMU	EMU	Linksys	LIN	Silicom	SIL
Asante	ASA	Enterasys	ENT	Marconi	MAR	Smartoptic	SMO
Avago	AVA	Extreme	EXT	McAfee	McA	SMC	SMC
Avaya	AVY	F5 Networks	F5	Meraki	MER	Solarflare	SLF
Black Box	BLK	Finisar	FIN	Milan Techn	MIL	Sun	SUN
Blade	BLA	Fluke	FLU	Moxa	MOX	SuperMicro	SUP
Bluecoat	BLU	Force 10	F10	NetAPP	NAP	Telco	TEL
Broadcom	BRD	Fortinet	FOR	Netgear	NET	TP-Link	TPL
Brocade	BRO	Foundry	FOU	Nortel	NOR	Transition	TRA
Calix	CAL	Fujitsu	FUJ	Packeteer	PKT	Trendnet	TRE
Ceragon Networks	CRN	Gigamon	GIG	PacketLight	PKL	Voltaire	VOL
Check Point	CHE	H3C	H3C	Palo Alto	PAL	WGD	WGD
CHL	CHL	HIR	HIR	Penguin	PEN	WES	WES
Ciena	CIE	HP	HP	Perle	PER	ZTE	ZTE
Cisco	CIS	HP ProCurve	HPP	PicoLight	PIC	ZYXEL	ZYX
Citrix	CIX	Huawei	HUA	Planet	PLA		