

10GBASE-T Copper SFP+ Transceiver

ASF-10G-T

Features

- Support 10GBASE-T Operation in Host Systems
- Support RX_LOS as Link indication function
- Hot-Pluggable SFP Footprint
- Compact RJ-45 Connector Assembly
- Compliant with SFP MSA
- Operating Case Temperature:
 - Standard: 0°C~70°C



Applications

- 10G BASE-T IEEE 802.3an
- 1000BASE-T IEEE 802.3ab
- 100BASE-TX IEEE 802.3u
- 5G MGBASE-T
- 2.5G MGBASE-T

Product Description

ASF-10G-T 10G BASE-T Copper Small Form Pluggable (SFP) modules are based on the SFP Multi Source Agreement (MSA). It is compliant with the 10G BASE-T, 1000BASE-T, 100BASE-TX standards as specified in IEEE STD 802.3an, 802.3ab and 802.3au.

Absolute Maximum Ratings*

Parameter	Symbol	Min	Typ	Max	Units
Maximum Supply Voltage	Vcc	-0.5		4.0	V
Storage Temperature	TS	-40		85	°C

*Exceeding any one of these values may destroy the device permanently.

Normal operating condition

Parameter	Symbol		Min	Typ	Max	Units
Operating Case Temperature	Tc	ASF-10G-T	0		70	°C
Supply Voltage	Vcc		3.14	3.3	3.46	V

Regulatory Compliance*Note1

Product Certificate	Certificate Number	Applicable Standard
TUV	R50135086	EN 60950-1:2006+A11+A1+A12+A2
		EN 60825-1:2014
		EN 60825-2:2004+A1+A2
UL	E317337	UL 60950-1
		CSA C22.2 No. 60950-1-07
EMC CE	AE 50285865 0001	EN 55022:2010
		EN 55024:2010
FCC	WTF14F0514417E	47 CFR PART 15 OCT., 2013
FDA	/	CDRH 1040.10
ROHS	/	2011/65/EU

Note1: The above certificate number updated to June 2014, because some certificate will be updated every year, such as

FDA and ROHS. For the latest certification information, please check with 10Gtek.

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
+3.3 Volt Electrical Power Interface						
Supply Current	I _{cc}			800	mA	
Input Voltage	V _{cc}	3.13	3.3	3.47	V	
Low-Speed Signals, Electronic Characteristics						
SFP Output LOW	V _{OL}	0		0.5	V	4.7k to 10k pull-up to host_V _{cc} , measured at host side of 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
High-Speed Electrical Interface, Transmission Line-SFP						
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
High-Speed Electrical Interface, Host-SFP						
Single ended data input swing	V _{in}	250		1200	mV	Single ended
Single ended data output swing	V _{out}	350		800	mV	Single ended
Rise/Fall Time	T _r ,T _f		20		psec	20%-80%
Tx Input Impedance	Z _{in}		50		Ohm	Single ended

Rx Output Impedance	Zout		50		Ohm	Single ended
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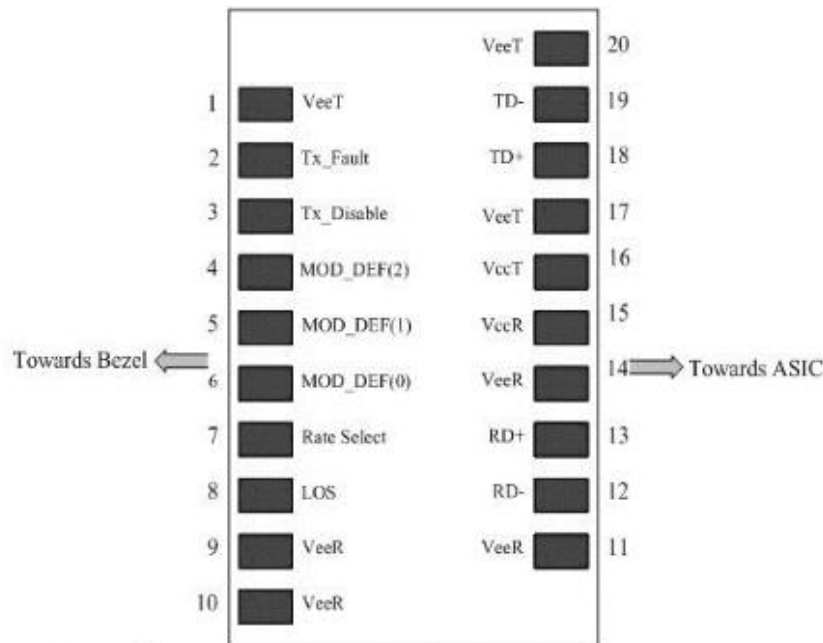
Pin Descriptions

Pin No.	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	Not used
3	TX Disable	Transmitter Disable	3	1
4	MOD-DEF2	Module Definition 2	3	2
5	MOD-DEF1	Module Definition 1	3	2
6	MOD-DEF0	Module Definition 0	3	2
7	RS0	No Connection required	3	
8	LOS	Loss of Signal	3	RX_LOSS
9	RS1	No Connection required	1	
10	VeeR	Receiver Ground	1	
11	VeeR	Receiver Ground	1	
12	RD-	Inv. Received Data Out	3	
13	RD+	Received Data Out	3	
14	VeeR	Receiver Ground	1	
15	VccR	Receiver Power	2	
16	VccT	Transmitter Power	2	
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	
19	TD-	Inv. Transmit Data In	3	
20	VeeT	Transmitter Ground	1	

Notes:

1. PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V, used to reset the module.
2. Should be pulled up with 4.7k – 10k Ohm 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.

The following is the Diagram of host board connector block pin numbers and names



Serial Communication Protocol

10Gtek Copper SFPs support the 2-wire serial communication protocol outlined in the SFP MSA, These SFP use a 128 byte EEPROM with an address of A0H.

EEPROM Serial ID Memory Contents

Accessing Serial ID Memory uses the 2 wire address 1010000X (A0H). Memory Contents of Serial ID are shown in Table 1.

Table 1 Serial ID Memory Contents

Addr.	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	07	-LC

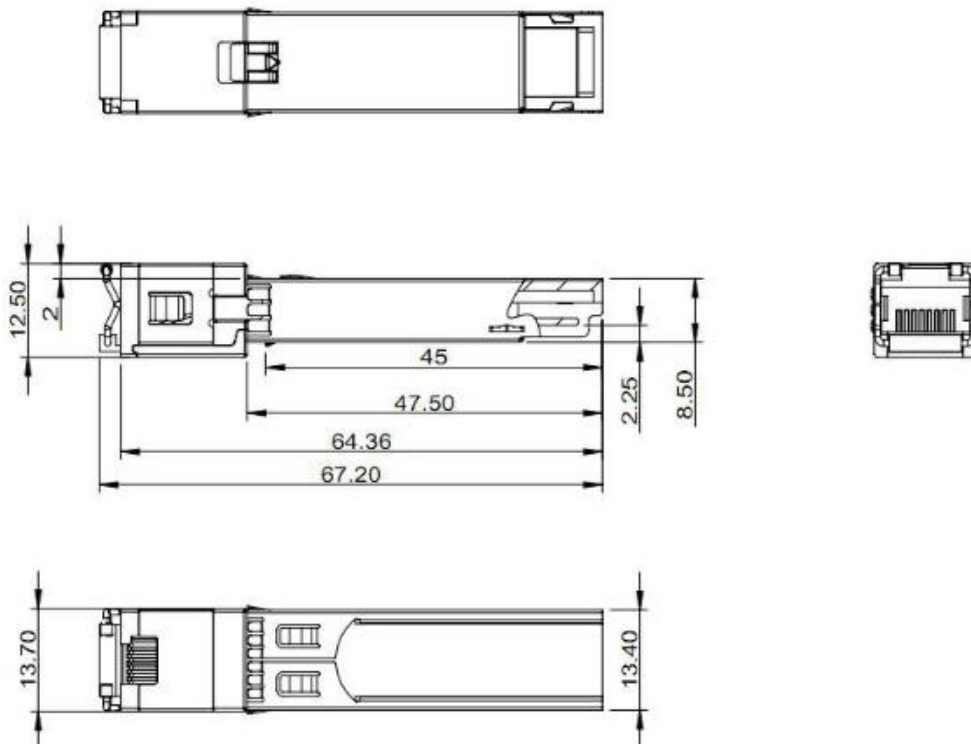
3-10	8	Transceiver	10 00 00 00 00 00 00 00	Transmitter Code
11	1	Encoding	06	64B/66B
12	1	BR, Nominal	67	10.3G
13	1	Reserved	00	-
14	1	Length (9µm)km	00	
15	1	Length(9µm)100m	00	
16	1	Length (50µm) 10m	08	80m
17	1	Length(62.5µm)10m	02	20m
18	1	Length (Copper)	00	
19	1	Reserved	1E	300m
20-35	16	Vendor name	XX XX XX XX XX XX XX XX(note2)20 20	Vendor name (ASCII)
36	1	Reserved	00	-
37-39	3	Vendor OUI	XX XX XX(note2)	-
40-55	16	Vendor PN	XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX(note2)	Transceiver part number
56-59	4	Vendor rev	XX XX XX XX(note2)	-
60-61	2	Wavelength	03 52	-850nm
62	1	Reserved	00	-
63	1	CC_BASE	Check Sum (Variable)	Check code for Base ID Fields
EXTENDED ID FIELDS				
64-65	2	Options	00 1A	TX_DISABLE, TX_FAULT and Loss of Signal implemented.
66	1	BR,max	00	
67	1	BR,min	00	
68-83	16	Vendor SN	XX XX XX XX XX XX XX XX 20 20 20 20 20 20 20 20(note2)	Serial Number of transceiver (ASCII). For example "B000822".
84-91	8	Date code	XX XX XX XX XX XX XX XX(note2)	Manufactory date code. For example "080405".
92	1	Diagnostic Monitoring Type	XX(note2)	Digital diagnostic monitoring implemented

93	1	Enhanced Options	XX(note2)	Optional flags
94	1	SFF_8472 Compliance	XX(note2)	01 for diagnostics (Rev9.3 SFF-8472).
95	1	CC_EXT	Check Sum	Check sum for Extended ID
			(Variable)	Field.
VENDOR SPECIFIC ID FIELDS				
96-127	32	Vendor Specific	Read only	Depends on customer information
128-255	128	Reserved	Read only	-

Note2: The "XX" byte should be filled in according to practical case. For more information, please refer to the related document of SFP Multi-Source Agreement (MSA).

Mechanical Specifications

10Gtek's Copper SFP transceivers are compliant with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



*This 2D drawing only for reference, please check with 10Gtek before ordering.

Notice

10Gtek reserves the right to make changes to or discontinue any optical link product or service identified in this publication, without notice, in order to improve design and/or performance. Applications that are described herein for any of the optical link products are for illustrative purposes only. 10Gtek makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Order Information

Part No.	Data Rate	Media type	Distance	Connector	Temperature
ASF-10G-T* Note3	10G	CAT6A/CAT7	20m	RJ45	Standard

Note3: Standard version.

*The product image only for reference purpose.

Revision History

Revision	Initiated	Approved	content	Release Date
Ver1.0	Jacky	Nicky	Released	Dec/2016
Ver1.1	QR.HUANG	Nicky	Released	July/2017

Further Information

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