

## FN-TRAN-GC-C

Fortinet® FN-TRAN-GC Compatible TAA 10/100/1000Base-TX SFP Transceiver (Copper, 100m, RJ-45, -40 to 85C)

### Features:

- Up to 1.25Gbps bi-directional data links
- Compliant with IEEE 802.3z, IEEE 802.3u, IEEE 802.3ab
- Compliant with SFP MSA
- Hot-pluggable
- Support 10/100/1000BASE-T operation in host systems with SGMII interface
- RJ-45 connector
- Auto-sense MDI/MDIX
- Single power supply 3.3V
- Operating Temperature: -40 to 85 Celsius
- RoHS Compliant and Lead-Free



### Applications:

- 1000Base Ethernet
- Access and Enterprise

### Product Description

This Fortinet® FN-TRAN-GC compatible SFP transceiver provides 10/100/1000Base-TX throughput up to 100m over a copper connection via a RJ-45 connector. This TX module supports 10/100/1000Base auto-negotiation and can be configured to fit your needs. It is guaranteed to be 100% compatible with the equivalent Fortinet® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. It is built to meet or exceed the specifications of Fortinet®, as well as to comply with MSA (Multi-Source Agreement) standards to ensure seamless network integration. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S.-made or designated country end products.")



## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Rate	DR	10		1000	Mb/sec	1
Cable Length	CL			100	m	2
Bit Error Rate	BER			10 <sup>-12</sup>		
Storage Temperature	Tstg	-40		85	°C	3
Supply Current	I <sub>cc</sub>		370	420	mA	
Maximum Voltage	V <sub>MAX</sub>			4	V	
Operating Temperature	T <sub>c</sub>	-40		85	°C	

### Notes:

1. IEEE 802.3 compatible.
2. Category 5 UTP.
3. Ambient temperature.

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Input Voltage	V <sub>CC</sub>	3.14	3.3	3.46	V	
Power Consumption	P		1.22	1.38	W	
Single-Ended Input Swing	V <sub>IN,pp</sub>	250		1200	mV	
Single-Ended Output Swing	V <sub>OUT,pp</sub>	275		800	mV	
Rise/Fall Time (20-80%)	T <sub>r</sub> /T <sub>f</sub>		175		ps	
Tx Input Impedance	Z <sub>IN</sub>		50		Ω	1
Rx Output Impedance	Z <sub>OUT</sub>		50		Ω	1
Transmitter						
Line Frequency	F <sub>L</sub>		125		MHz	1
Tx Output Impedance Differential	Z <sub>OUT,TX</sub>		100		Ω	2
Rx Input Impedance Differential	Z <sub>IN,RX</sub>		100		Ω	2
Low-Speed Electrical Signal						
SFP Output - Low	V <sub>OL</sub>	0		0.5	V	1
SFP Output - High	V <sub>OH</sub>	Host_Vcc-0.5		Host_Vcc+0.3	V	1
SFP Input - Low	V <sub>IL</sub>	0		0.8	V	1
SFP Input - High	V <sub>IH</sub>	2		Vcc+0.3	V	1

### Notes:

1. Single-ended.
2. 5-level encoding.
3. For all frequencies between 1MHz and 125MHz.
4. External 4.7kΩ to 10kΩ pull-up resistor required.

## Pin Descriptions

Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	Tx_Fault	Transmitter Fault. Not Supported.	
3	Tx_Disable	Transmitter Disable. PHY disabled on “high” or “open.”	2
4	MOD_DEF(2)	Module Definition 2. 2-Wire Serial Interface Data.	3
5	MOD_DEF(1)	Module Definition 1. 2-Wire Serial Interface Clock.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No Connection Required.	
8	LOS	Loss of Signal.	
9	VeeR	Receiver Ground (Common with Transmitter Ground).	1
10	VeeR	Receiver Ground (Common with Transmitter Ground).	1
11	VeeR	Receiver Ground (Common with Transmitter Ground).	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).	1
15	VccR	Receiver Power Supply.	
16	VccT	Transmitter Power Supply.	
17	VeeT	Transmitter Ground (Common with Receiver Ground).	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).	1

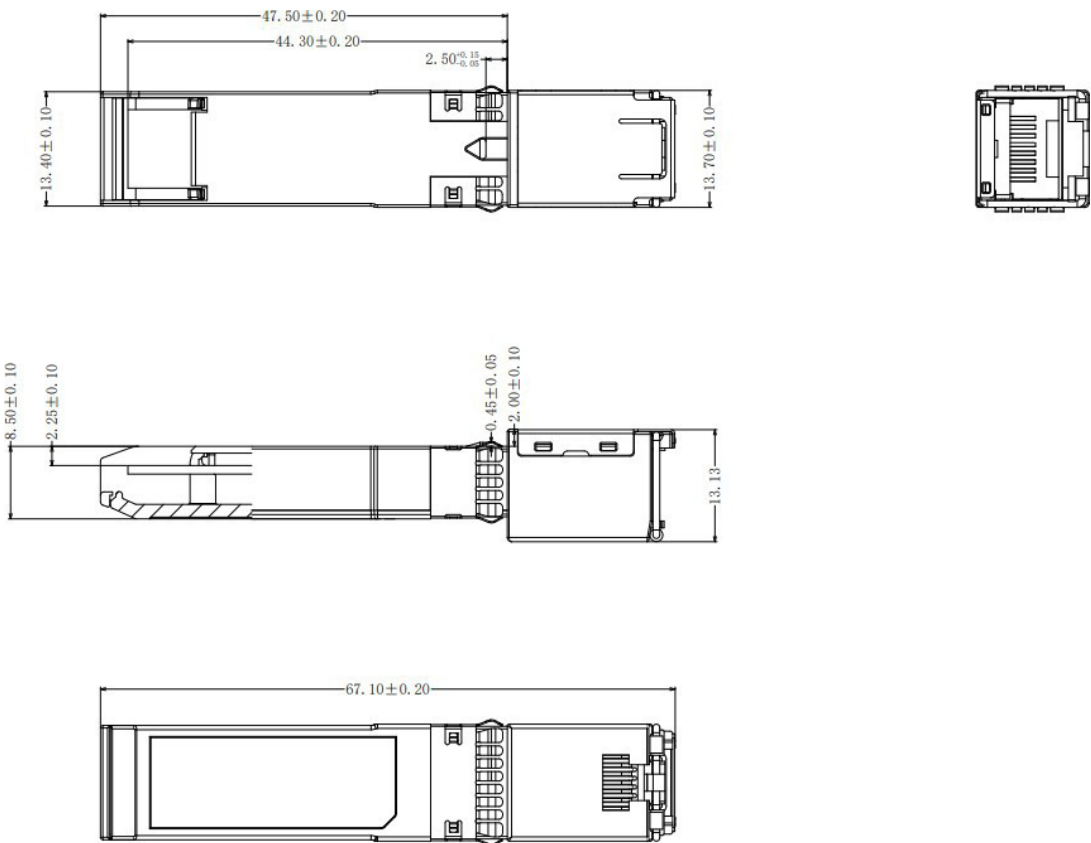
## Notes:

1. The circuit ground is connected to the chassis ground.
2. Disabled:  $T_{DIS} > 2V$  or open. Enabled:  $T_{DIS} < 0.8V$ .
3. Should be pulled up with 4.7kΩ to 10kΩ on the host board to a voltage between 2V and 3.6V.

Electrical Pad Layout



Mechanical Specifications



## About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

## Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

## Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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