

## 10GBASE-T SFP+ Copper RJ45 30m Transceiver

### SFPP Series



- Hot-pluggable SFP footprint
- Supports 10GBASE-T / 5GBASE-T / 2.5GBASE-T / 1000BASE-T
- Compact RJ45 connector assembly
- RoHS compliant and lead-free
- Commercial Temperature Range: 0 °C to +70°C
- Single +3.3 V power supply
- 10 Gigabit Ethernet over Cat6a/Cat7 cable

Ascent's 10GBASE-T SFP+ copper transceivers are based on the SFP Multi-Source Agreement (MSA). These 10GBASE SFP+ series modules offer a wide variety of 10 Gigabit Ethernet connectivity options for data center, enterprise wiring closet, and service provider transport applications.

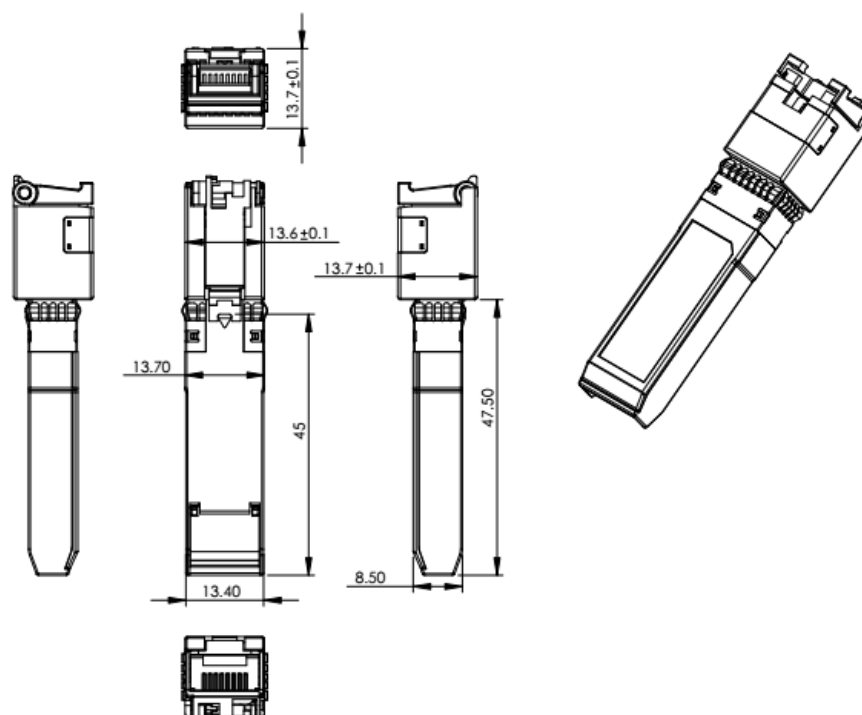
The 10GBASE-T SFP+ copper transceivers are compatible with the 10GBASE-T / 5GBASE-T / 2.5GBASE-T / 1000BASE-T standards as specified in IEEE Std 802.3. 10GBASE-T SFP+ copper transceivers use the SFP's RX\_LOS pin for link indication. If pull up SFP's TX\_DISABLE pin, PHY IC will be reset.

Ascent SFP+ modules offer the Industry's smallest 10G form factor for greatest density per chassis. These are hot-swappable input/output device that plugs into an Ethernet SFP+ port of a switch and no need to power down if installing or replacing. Supports "pay-as-you-populate" model for investment protection and ease of technology migration. Digital optical monitoring capability for strong diagnostic capabilities. Optical interoperability with 10GBASE XENPAK, 10GBASE X2, and 10GBASE XFP interfaces on the same link.

## Key Features

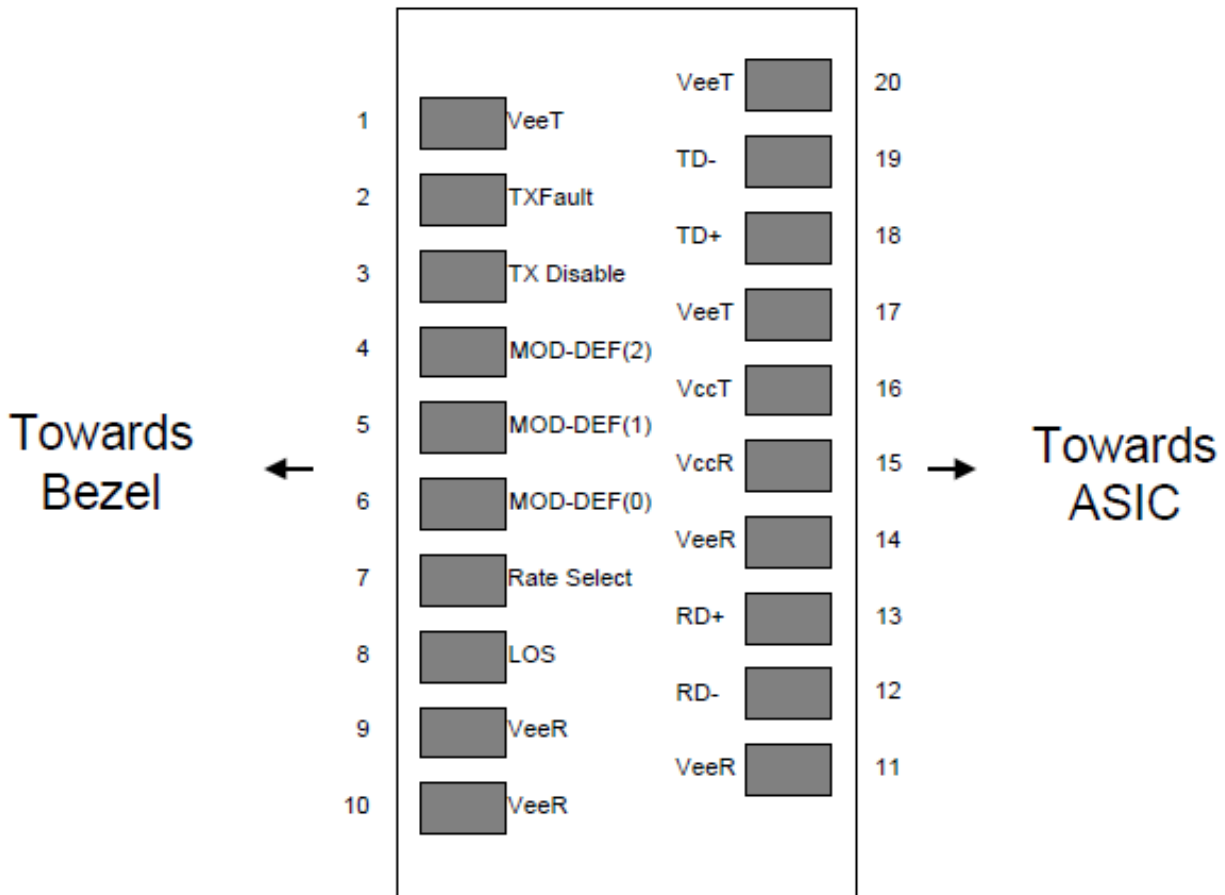
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## Outline Dimensions



Units in mm

## Pin Assignment



**Diagram of Host Board Connector Block Pin Numbers and Names**

Pin	Symbol	Name/Description	Note
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	TFAULT	Transmitter Fault. Not supported.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required	
8	LOS	High indicates no linked. low indicates linked.	4
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. Circuit ground is connected to chassis ground
2. PHY disabled on TDIS > 2.0 V or open, enabled on TDIS < 0.8 V
3. Should be pulled up with 4.7kΩ to 10kΩs 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.
4. LVTTTL compatible with a maximum voltage of 2.5 V.

## Specifications

### General Product Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Bit Rate	BR	1		10	Gb/sec	IEEE 802.3 compatible.

## Note:

Clock tolerance is ±50 ppm

### Environmental Specifications

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Operating Temperature	Top	0		65	°C	Case temperature
Storage Temperature	Tsto	-40		85	°C	Ambient temperature

## Notes:

Automatic crossover detection is enabled. External crossover cable is not required.

### Transmission Distances

Standard	Cable	Reach	Host Port
10GBASE-T	Cat6a/Cat7	30m	XFI
5GBASE-T/2.5GBASE-T	Cat5e	50m	5GBASE-R/2.5GBASE-X
1000BASE-T	Cat5e	100m	1000BASE-FX

## Electronic Characteristics

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

### Low-Speed Signals, Electronic Characteristics

Parameter	Symbol	Min	Max	Unit	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

## +3.3V Volt Electrical Power Interface

The SFPP-AT-CO-03 has an input voltage range of 3.3 V +/- 5%. The 4V maximum voltage is not allowed for continuous operation.

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Supply Current	I <sub>s</sub>		700	900	mA	3.0 W max power over a full range of voltage and temperature. See caution note below.
Input Voltage	V <sub>cc</sub>	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	V <sub>max</sub>			4	V	
Surge Current	I <sub>surge</sub>		TBD		mA	Hot plug above steady state current. See caution note below.

### Note:

Power consumption and surge current are higher than the specified values in the SFP MSA.

## High-Speed Electrical Interface

All high-speed signals are AC-coupled internally.

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
<b>High-Speed Electrical Interface, Transmission Line-SFP</b>						
Line Frequency	f <sub>L</sub>		125		MHz	5-level encoding, per IEEE 802.3
Tx Output Impedance	Z <sub>out,TX</sub>		100		Ω	Differential, for all frequencies between 1MHz and 125 MHz
Rx Input Impedance	Z <sub>in,RX</sub>		100		Ω	Differential, for all frequencies between 1MHz and 125 MHz

## High-Speed Electrical Interface, Host-SFP

Single ended data input swing	V <sub>in</sub> swing	250	1200	mV	Single-ended
Single ended data output swing	V <sub>out</sub> swing	350	800	mV	Single-ended
Rise/Fall Time	T <sub>r</sub> , T <sub>f</sub>	175		psec	20 % to 80 %
Tx Input Impedance	Z <sub>in</sub>	50		Ω	Single-ended
Rx Output Impedance	Z <sub>out</sub>	50		Ω	Single-ended

## Serial Communication Protocol

All Ascent SFPs support the 2-wire serial communication protocol outlined in the SFP MSA. These SFPs use an MCU, can be accessed with address of A0h.

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
<b>Serial Bus Timing, Requirements</b>						
I <sup>2</sup> C Clock Rate		0		200,000	Hz	

## Ordering Information

### Product Name

SFPP-AT-CO-03

### Product Description

SFP+ Plug-in, 10 Gbps Copper Transceiver, RJ45, 10GBASE-T over Cat6a/Cat7 cable, 30 m

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