1G SFP RJ45 Copper Optical Transceiver
PN: VT-011CMxR-AA

Product Overview

Vitex's 1G SFP RJ45 Copper transceiver delivers a robust, cost-effective solution for high-speed Gigabit Ethernet connectivity. Designed to support 1000BASE-T operation in host systems, this transceiver enables reliable communication over Cat5 UTP cable up to 100 meters, making it ideal for LAN, switch-to-switch, and router/server interfaces. It's hot-pluggable SFP footprint, fully metallic enclosure for low EMI, and low power dissipation (<1.2W) ensure optimal performance in either commercial (0°C to 70°C) and industrial (-40°C to 85°C) environments.

Features

- Support 1000BASE-T Operation in Host Systems
- For 100m Reach over Cat5 UTP Cable
- Hot-Pluggable SFP Footprint
- Fully metallic enclosure for low EMI
- Low power dissipation, Power Dissipation < 1.2W
- Compact RJ-45 connector assembly
- Detailed product information in EEPROM
- Operating temperature range (Case Temperature)
    - Commercial Level: 0°C to 70°C
    - Industrial Level: -40°C to 85°C

Applications

- LAN 1000Base-T
- Switch to Switch Interface
- Router/Server Interface
- Gigabit Ethernet over Cat5 Cable
- Compliant with MSA SFP Specification
- Compliant with IEEE Std 802.3-2002

Ordering Information

Part Number	Description
VT-011CMCR-AA	1G SFP 100m 1000 BASE-T, CAT5, RJ45 Copper, C-temp
VT-011CMIR-AA	1G SFP 100m 1000 BASE-T, CAT5, RJ45 Copper, I-temp

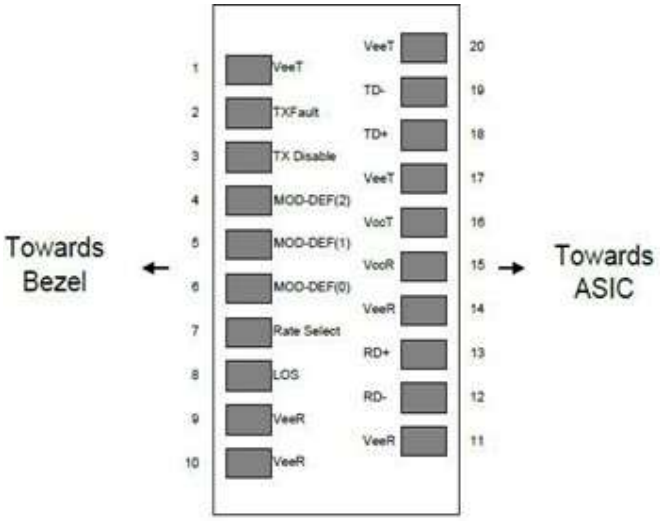
General Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Remarks
Distance				100	m	Category 5 UTP. BER < 1E-12
Data Rate			1000		Mbps	
Storage Temperature	T_S	-40		85	℃	
Maximum Supply Voltage	VCC	-0.5		3.6	V	
Operating Relative Humidity		5		85	%	
Operating Case Temperature	Tc	0		70	°C	C-temp
		-40		85	°C	I-temp
Power Supply Voltage (Recommended)		3.15	3.3	3.45	V	

Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
+3.3 Volt Electrical Power Interface						
Supply Current	Icc		300	350	mA	
Input Voltage	Vcc	3.13	3.3	3.47	V	
Surge Current (Isurge)				30	mA	
Low-Speed Signals, Electronic Characteristics						
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
High-Speed Electrical Interface, Transmission Line-SFP						
Line Baud Rates	fL		125		MHz	5 level encoding per IEEE802.3
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
High-Speed Electrical Interface, Host-SFP						
Single ended data input swing	Vin	250		1200	mV	Single ended
Single ended data output swing	Vout	300		800	mV	Single ended
Rise/Fall Time	Tr, Tf		175		nsec	20%-80%
TX Input Impedance	Zin		50		Ohm	Single ended
RX Output Impedance	Zout		50		Ohm	Single ended

Electrical Connector Layout



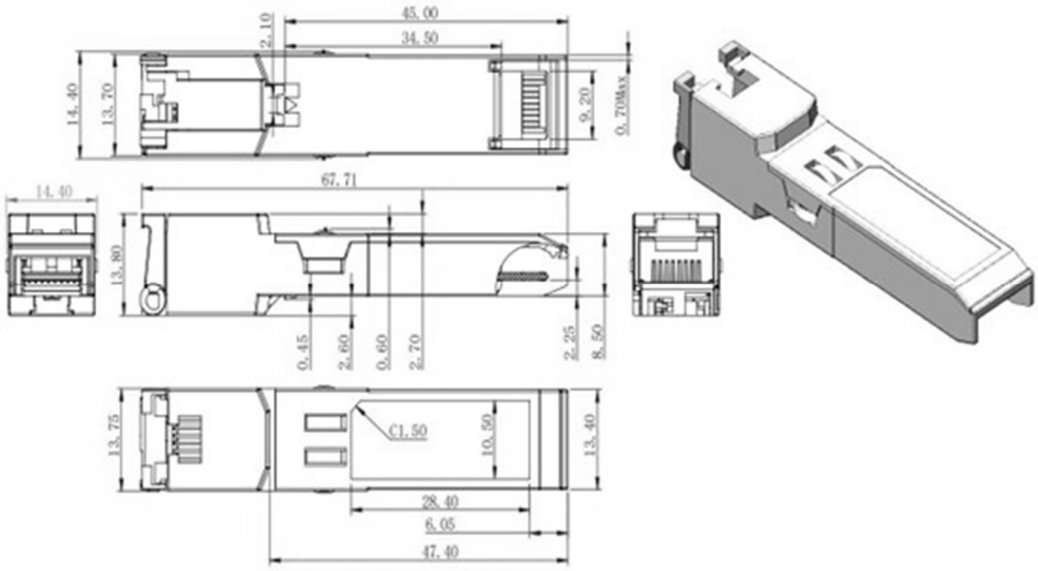
Electrical Pin Definition

PIN #	Symbol	Description	Plug Seq	Remarks
1	VeeT	Transmitter Ground	1	5
2	TX Fault	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable	3	2) Module disables on high or open
4	MOD-DEF2	Module Definition 2	3	3) 2 wire serial ID interface.
5	MOD-DEF1	Module Definition 1	3	3) 2 wire serial ID interface.
6	MOD-DEF0	Module Definition 0	3	3) Grounded within the module.
7	Rate Select	Not Connect	3	Function not available
8	LOS	Loss of Signal	3	4
9	VeeR	Receiver Ground	1	5
10	VeeR	Receiver Ground	1	5
11	VeeR	Receiver Ground	1	5
12	RD-	Inv. Received Data Out	3	6
13	RD+	Received Data Out	3	7
14	VeeR	Receiver Ground	1	5
15	VccR	Receiver Power	2	7) 3.3 ± 5%
16	VccT	Transmitter Power	2	7) 3.3 ± 5%
17	VeeT	Transmitter Ground	1	5
18	TD+	Transmit Data In	3	8
19	TD-	Inv. Transmit Data In	3	8
20	VeeT	Transmitter	1	5

1. TX Fault is an open collector/drain output, which should be pulled up with a 4.7–10KΩ resistor on the host board. Pull up voltage between 2.0V and VccT/R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.
2. TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7–10KΩ resistor. Its states are:
    a. Low (0 – 0.8V): Transmitter on

   b. (>0.8, < 2.0V): Undefined
   c. High (2.0 – 3.465V): Transmitter Disabled
   d. Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are module definition pins. They should be pulled up with a 4.7–10KΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
   a. Mod-Def 0 is grounded by the module to indicate that the module is present.
   b. Mod-Def 1 is the clock line of two wire serial interface for serial ID.
   c. Mod-Def 2 is the data line of two wire serial interface for serial ID.
4. LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7–10KΩ 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.
5. VeeR and VeeT may be internally connected within the SFP module.
6. RD-/+: These are the differential receiver outputs. They are AC coupled with 100 differential Lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board. The voltage swing on these lines will be between 400 and 2000mV differential (200 –1000mV single ended) when properly terminated.
7. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V±5% at the SFP connector pin. Maximum supply current is 300mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1 ohm should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage when the recommended supply-filtering network is used, hot plugging of the SFP transceiver module will result in an in rush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.
8. TD-/+: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 differential terminations inside the module. The AC coupling is done inside the module and is thus not required on the host board. The inputs will accept differential swings of 400 – 2000mV (200 – 1000mV single-ended).

Electrical Connector Layout



Revision History

Date	Rev	Description
01/20/2022	1.0	Release version
02/05/2025	2.0	New branding guidelines
02/06/2025	2.1	Fixed Pin assignment table

For more information

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