



1.25G SFP-10/100/1000T Transceiver
Hot Pluggable, RJ-45, Active Copper SFP

Part Number: FSFP-CJ-Txx-X1



Overview:

FSFP-CJ-Txx-X1 Small Form Factor Pluggable SFP Copper transceivers are compliant with the current SFP Multi-Source Agreement (MSA) Specification. The high performance designed is integrated full duplex data link at 1.25Gbps over four pair Category 5 UTP cable up to 100m links. User can be accessed SFP serial ID information with address of A0h via the 2-wire serial bus I2C protocol. The PHY IC can also be accessed via 2-wire serial bus at address ACh.

Applications:

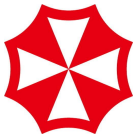
- I Gigabit Ethernet 10/100/1000BASE-T

Features:

- I Compliant with IEEE802.3-2002 and 802.3ab
- I Compliant with SFP MSA
- I Hot Pluggable
- I Auto-detect MDI/MDI-X
- I Compatible with 1000BASE-X and 1000BASE-T auto-negotiation
- I 10/100/1000BASE-T operation in host system with SGMII interface
- I RJ-45 connector
- I Single +3.3V power supply
- I Link length up to 100m with four-pair Cat.5 UTP cable
- I RoHS Compliant

Absolute Maximum Ratings:

Parameters	Symbol	Min.	Max.	Unit
Storage Temperature	T _{ST}	-40	+85	°C
Storage Relative Humidity	RH	5	95	%
Supply Voltage	V _{CC}	-0.5	+4.0	V



Recommended Operating Conditions:

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temp. (FSFP-CJ-Txx-X1)	T _{OP}	0	-	+70	°C
Case Operating Temp. (FSFP-CJ-Txx-X1i)	T _{OP}	-40	-	+85	°C
Supply Voltage	V _{CC}	+3.13	+3.3	+3.47	V
Supply Current	I _{CC}		320	375	mA
Power Consumption	P			1.2	W

General Specifications:

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Data Rate	DR	10		1250	Mb/sec	1
Bit Error Rate	BER			10 ⁻¹²		

Note1: 10/100/1000BASE-T operation requires an SGMII interface with no clocks in the host system. With a SERDES interface that does not support SGMII, the module will operate at 1000BASE-T only.

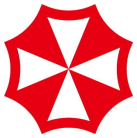
High-Speed Electrical Interface, Host to SFP:

V_{CC}= 3.13V to 3.47V, T_{OP} = 0 °C to 70 °C (FSFP-CJ-Txx-X1); -40 °C to 85 °C (FSFP-CJ-Txx-X1i)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
TD+, TD- Input Voltage Swing	V _{IN+} / V _{IN-}	250		1200	mV	1
RD+, RD- Output Voltage Swing	V _{out+} / V _{out-}	350		800	mV	1
Rise Time (Receiver)	T _r		180	250	ps	2
Fall Time (Receiver)	T _f		180	250	ps	2
Tx Input Impedance	Z _{in}		50		Ohm	1
Rx Output Impedance	Z _{out}		50		Ohm	1

Note1: Single ended.

Note2: 20% to 80% value.



High-Speed Electrical Interface, Cable to SFP:

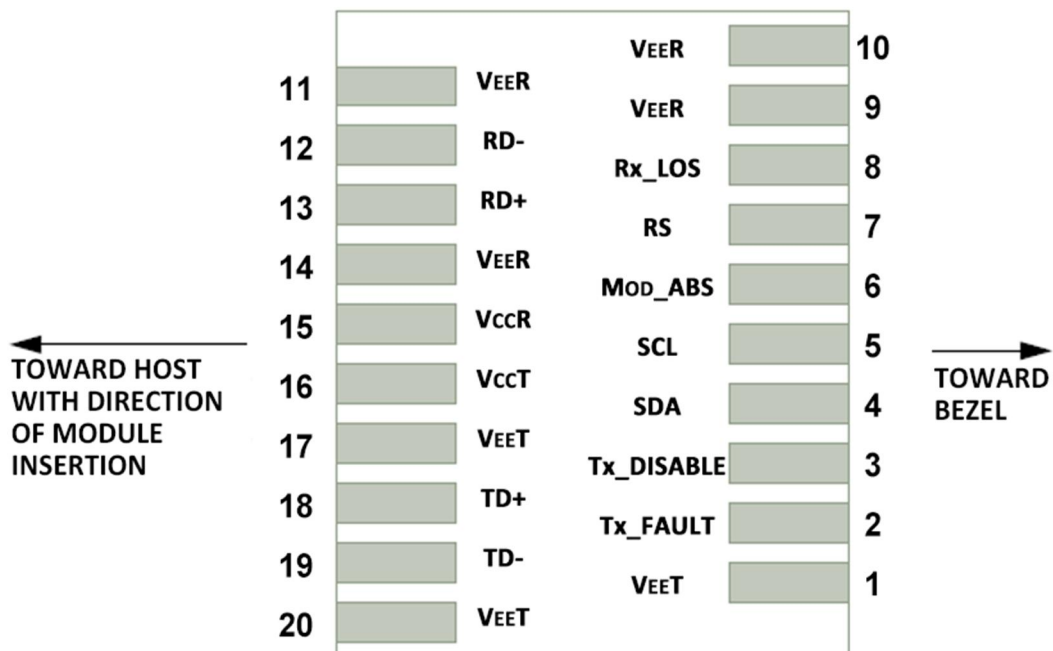
V_{CC}= 3.13V to 3.47V, T_{OP} = 0 °C to 70 °C (FSFP-CJ-Txx-X1); -40 °C to 85 °C (FSFP-CJ-Txx-X1i)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Transmission Frequency	Ft	10		1250	MHz	1
TX Output Impedance	Z _{out.TX}		100		Ohm	2
RX Output Impedance	Z _{in.RX}		100		Ohm	2

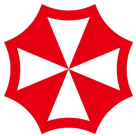
Note1: 4D-PAM-5 encoding per IEEE802.3: 2002

Note2: Differential for frequencies ranging from 1MHz to 1.25GHz

Pin Assignment:



Host PCB SFP Pad Assignment Top View



Pin Description:

Pin	Name	Function / Description
1	VEET	Transmitter Ground
2	Tx_FAULT	Transmitter Fault Indication (1)
3	Tx_DISABLE	Transmitter Disable – Turns off transmitter laser output (2)
4	SDA	2-wire Serial Interface Data Line (SDA: Serial Data Signal) (3)
5	SCL	2-wire Serial Interface Clock (SCL: Serial Clock Signal) (3)
6	MOD_ABS	Module Absent, connected to VEET or VEER in the module (3)
7	RS	Rate Select, optional (5)
8	Rx_LOS	Receiver Loss of Signal Indication (4)
9	VEER	Receiver Ground
10	VEER	Receiver Ground
11	VEER	Receiver Ground
12	RD-	Receiver Inverted Data output, Differential LVPECL, AC coupled
13	RD+	Receiver Non-Inverted Data output, Differential LVPECL, AC coupled
14	VEER	Receiver Ground
15	VCCR	Receiver 3.3V Power Supply
16	VcCT	Transmitter 3.3V Power Supply
17	VEET	Transmitter Ground
18	TD+	Transmitter Non-Inverted Data Input, Differential LVPECL, AC coupled
19	TD-	Transmitter Inverted Data Input, Differential LVPECL, AC coupled
20	VEET	Transmitter Ground

Note1: TX Fault is not used and is always tied to ground through a 100 ohm resistor.

Note2: TX Disable as described in the MSA is not applicable to the 1000BASE-T module, but is used for convenience as an input to reset the internal PHY IC. This pin is pulled up within the module with a 4.7KΩ resistor.

? Low (0 – 0.8 V): Transceiver on; Between (0.8 V and 2.0 V): Undefined

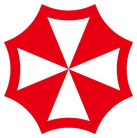
? High (2.0 – 3.465 V): Transceiver in reset state

? Open: Transceiver in reset state

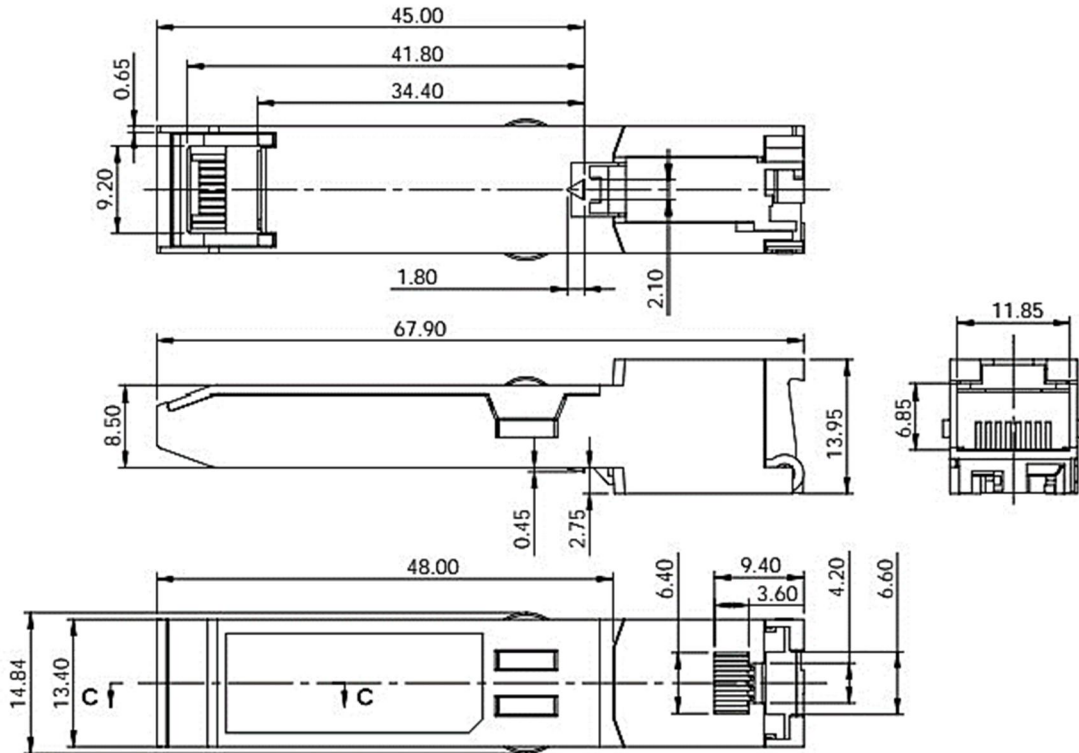
Note3: These are the module definition pins. They should be pulled up with a 4.7K~10KΩ resistor on the host board to supply less than VccT+0.3V or VccR+0.3V. MOD_ABS is grounded by the module to indicate that the module is present.

Note4: Rx_LOS (Loss of signal) is an open collector/drain output which should be pulled up externally with a 4.7K~10KΩ resistor on the host board to supply <VccT+0.3V or VccR+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.

Note5: No connect on this module.



Mechanical Dimensions:



(All Dimensions are ± 0.20 mm Unless Otherwise Specified, Unit: mm)



Ordering Information:

Part No.	Speed mode	MAC interface	1000BASE-X Auto-Negotiation enabled by default*2	Link Indicator on Rx_LOS pin	Temp.
FSFP-CJ-T10-X1	1000M*1	SERDES	Yes	No	0~70°C
FSFP-CJ-T10-X1i	1000M*1	SERDES	Yes	No	-40~85°C
FSFP-CJ-T11-X1	1000M*1	SERDES	Yes	Yes	0~70°C
FSFP-CJ-T11-X1i	1000M*1	SERDES	Yes	Yes	-40~85°C
FSFP-CJ-T01-X1	1000M*1	SERDES	No	Yes	0~70°C
FSFP-CJ-T01-X1i	1000M*1	SERDES	No	Yes	-40~85°C
FSFP-CJ-T22-X1	10/100/1000M	SGMII	Yes	Yes	0~70°C
FSFP-CJ-T22-X1i	10/100/1000M	SGMII	Yes	Yes	-40~85°C
FSFP-CJ-T20-X1	10/100/1000M	SGMII	Yes	No	0~70°C
FSFP-CJ-T20-X1i	10/100/1000M	SGMII	Yes	No	-40~85°C

NOTE1: 10/100/1000BASE -T operation requires the host system to have an SGMII interface with no clocks, and the module PHY to be configured by the host system. With a SERDES interface that does not support SGMII, the module will operate at 1000BASE-T only.

NOTE2: 1000BASE -T auto-negotiation is always activated.