FICER Technology Co., Ltd.
明虹科技股份有限公司
2F, No.138, Daye Rd., Beitou Dist.,
Taipei City 11268, Taiwan
www.Ficer.com

Rev.00T3.30_20240319

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

- Gigabit Ethernet 10/100/1000BASE-T

Features

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

Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Storage Temperature	TST	-40	+85	°C
Storage Relative Humidity	RH	5	95	%
Supply Voltage	VCC	-0.5	+4.0	V

TEL+886-2-2898-3830 FAX+886-2-2898-3840 Sales@Ficer.com Link Fiber to Future

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		1000	Mb/s	1
Cable Length	L			100	M	2

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.

Note2: Cat.5 UTP, BER<10^{-12}

High-Speed Electrical Interface, Cable to SFP

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Line Frequency	F_L		125		MHz	1
Tx Output Impedance	$Z_{OUT.Tx}$		100		Ohm	2
Rx Input 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.

High-Speed Electrical Interface, Host to SFP

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 / Fall Time (20~80%)	Tr / Tf		175		ps	
Tx Input Impedance	Z_{IN}		50		Ohm	1
Rx Output Impedance	Z_{OUT}		50		Ohm	1

Note1: Single ended.

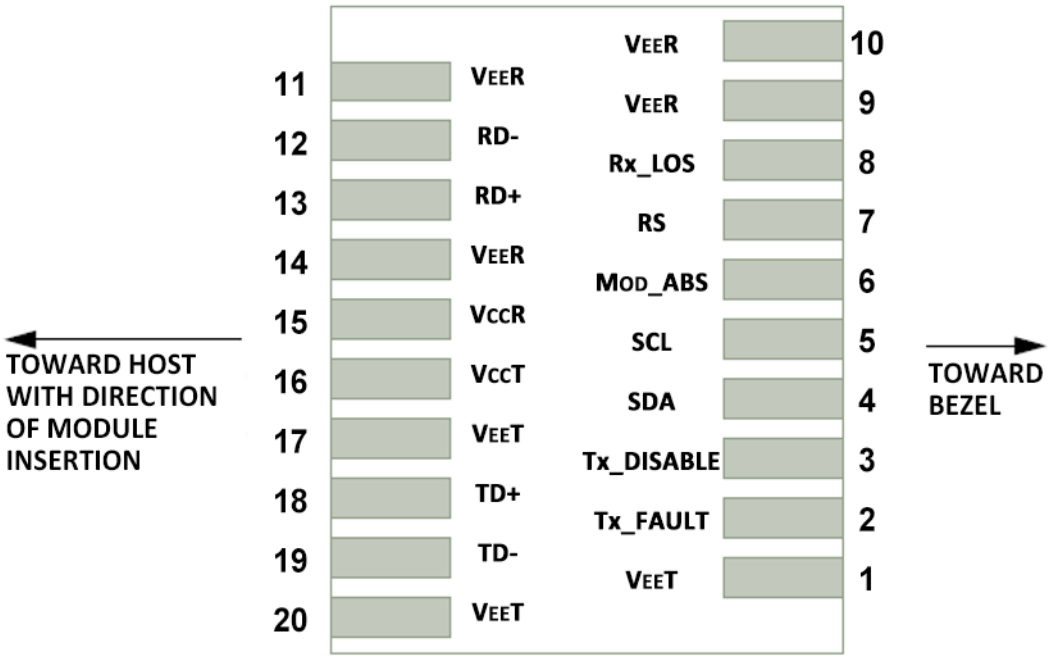
TEL+886-2-2898-3830 FAX+886-2-2898-3840 Sales@Ficer.com Link Fiber to Future

Low-Speed Signals

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.

Parameters	Symbol	Min.	Max.	Unit	Note
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

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

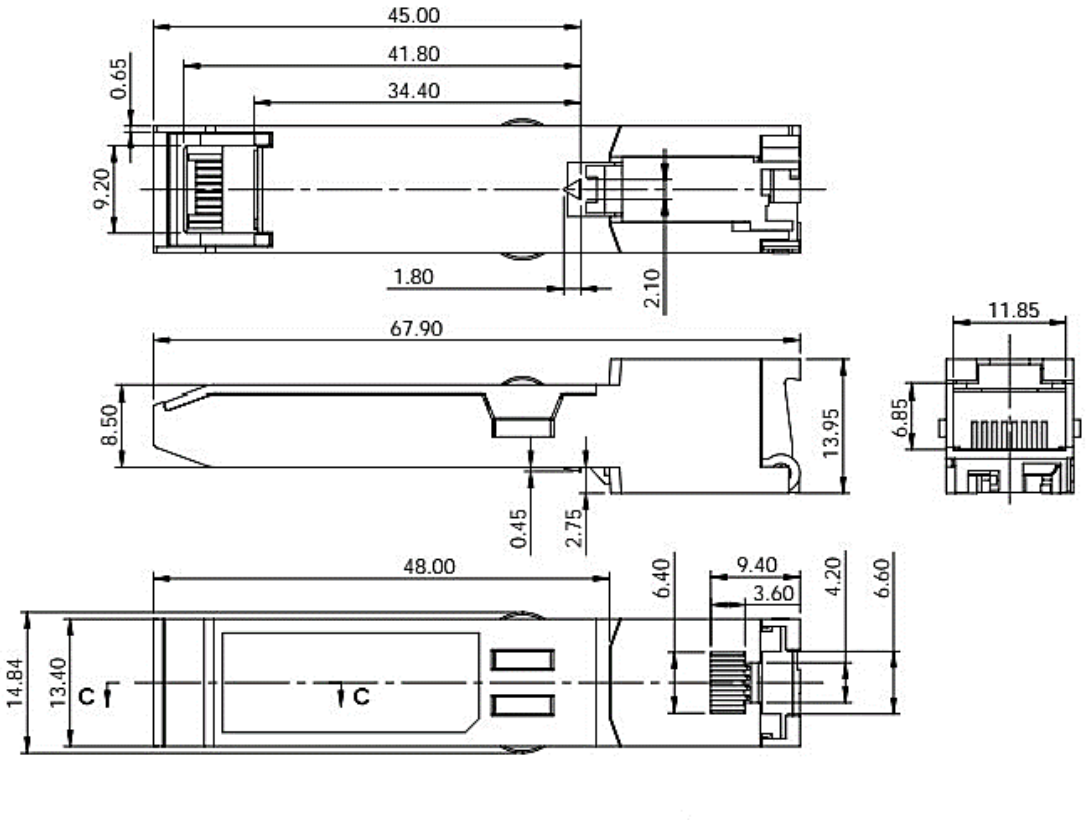
Note3: These are the module definition pins. They should be pulled up with a 4.7K~10KΩ resistor on the host board to supply less than VccT+0.3V or VccR+0.3V. MOD_ABS is grounded by the module to indicate that the module is present.

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.

2F, No.138, Daye Rd., Beitou Dist.,
Taipei City 11268, Taiwan
www.Ficer.com

Mechanical Dimensions



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

TEL+886-2-2898-3830 FAX+886-2-2898-3840 Sales@Ficer.com Link Fiber to Future

Ordering Information

Part No.	Host Port Interface	Speed Mode	1000BASE-X*2 auto-negotiation enabled by default	Link Indicator on Rx_LOS pin	Temp.
FSFP-CJ-T10-X1	SERDES	1000M*1	Yes	No	0~70°C
FSFP-CJ-T10-X1i	SERDES	1000M*1	Yes	No	-40~85°C
FSFP-CJ-T11-X1	SERDES	1000M*1	Yes	Yes	0~70°C
FSFP-CJ-T11-X1i	SERDES	1000M*1	Yes	Yes	-40~85°C
FSFP-CJ-T01-X1	SERDES	1000M*1	No	Yes	0~70°C
FSFP-CJ-T01-X1i	SERDES	1000M*1	No	Yes	-40~85°C
FSFP-CJ-T22-X1	SGMII	10/100/1000M	Yes	Yes	0~70°C
FSFP-CJ-T22-X1i	SGMII	10/100/1000M	Yes	Yes	-40~85°C
FSFP-CJ-T20-X1	SGMII	10/100/1000M	Yes	No	0~70°C
FSFP-CJ-T20-X1i	SGMII	10/100/1000M	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 SFP copper module PHY Interface 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: Here 1000BASE-X auto-negotiation is used to set the configuration options the SFP copper module advertises to the Host system after 1000BASE-T auto-negotiation via twisted-pair copper cable is completed. 1000BASE -T auto-negotiation is always activated.