FICER Technology Co., Ltd.
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SKU: 00T1H01

10G XFP SR Transceiver
Hot Pluggable, Duplex LC, 850nm VCSEL, MMF 300M, DDM, C-Temp

Part Number: FXFP-H7-M85-X3D

Overview

FXFP-H7-M85-X3D Small Form Factor 10Gb/s XFP transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification. The high performance uncooled 850nm VCSEL transmitter & high sensitivity PIN receiver provide superior performance for 10GBASE-SR/SW and 10G Fiber Channel 1200-M5E-SA-I applications up to MMF OM3 300m optical links.

Applications

- 10GBASE-SR/SW Ethernet @10.3125G
- Fiber Channel 1200-M5E-SA-I 10GFC @10.51875G
- SONET OC-192 & SDH STM-64 @9.953G
- CPRI Option #7 @9.83G, #8 @10.1376G
- OTN OTU2 @10.7G, OTU2e @11.09G, OTU2f @11.32G

Features

- Compliant with IEEE802.3ae 10GBASE-SR/SW
- Compliant with Fiber Channel 1200-M5E-SA-I
- Compliant with XFP MSA INF-8077i
- Support 9.95Gb/s to 11.32Gb/s multi-rates
- Hot-pluggable XFP footprint
- 850nm VCSEL transmitter and PIN receiver
- Duplex LC connector
- No Reference Clock required
- 2-wire interface for management and diagnostic monitor compliant with SFF-8472
- Single +3.3V power supply
- Link distance 300m over MM OM3 fiber and 400m over MM OM4 fiber
- Operating Temperature 0~+70°C
- Maximum Power consumption 1.4W
- RoHS compliant

Laser Safety

- This is a Class 1 Laser Product complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.
- Caution: Use of control or adjustments or performance of procedure other than those specified herein may result in hazardous radiation exposure.

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Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Storage Temperature	T_{ST}	-40	+85	°C
Relative Humidity	RH	5	85	%
Supply Voltage	V_{CC}	-0.5	+3.6	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temperature	T_{OP}	0	-	+70	°C
Supply Voltage	V_{CC}	+3.13	+3.3	+3.47	V
Supply Current	I_{CC}			400	mA
Module Total Power	P			1.4	W

Transmitter Electro-optical Characteristics

V_{CC} = 3.13V to 3.47V, T_{OP} = 0 °C to +70 °C

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Date Rate	DR	9.95	10.3125	11.32	Gb/s	
Optical Launch Power	Po	-5		-1	dBm	1
Optical Center Wavelength	λc	840	850	860	nm	
Optical Extinction Ratio	ER	3			dB	
Spectral Width (RMS)	Δλ			0.45	nm	
Optical Eye Mask	IEEE802.3ae					2
Relative Intensity Noise	RIN			-128	dB/Hz	
Input Differential Impedance	R_{IN}	90	100	110	Ω	3
Data Input Differential Voltage	V_{IN}	180		950	mV	
TX Disable Input Voltage-Low (TX ON)	$TDISV_L$	GND		0.8		
TX Disable Input Voltage-High (TX OFF)	$TDISV_H$	2.0		Vcc		
Tx Fault Output Voltage-Low (Tx Normal)	$TFLTV_L$	GND		0.8	V	
Tx Fault Output Voltage-High (Tx Fault)	$TFLTV_H$	2.0		V_{CC}	V	

Note1: The optical power is launched into a 50/125μm multi-mode fiber

Note2: Measured with a PRBS 2^{31}-1 test pattern @10.3125Gbps BER<10^{-12}

Note3: After internal AC coupling

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Receiver Electro-optical Characteristics

V_{CC} = 3.13V to 3.47V, T_{OP} = 0 °C to +70 °C

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Date Rate	DR	9.95	10.3125	11.32	Gb/s	
Receiver Sensitivity	SEN			-11	dBm	1
Maximum Receive Power	P_{RX-MAX}	+0.5			dBm	1
Optical Center Wavelength	λc	840		860	nm	
LOS De-Assert	LOS_D			-12	dBm	
LOS Assert	LOS_A	-26			dBm	
LOS Hysteresis	LOS_{HY}	0.5		4	dB	
Data Output Differential Voltage	V_{OUT}	400	600	800	mV	
Receiver LOS Signal Output Voltage-Low	$LOSV_L$	GND		0.8	V	2
Receiver LOS Signal Output Voltage-High	$LOSV_H$	2.0		Vcc	V	2

Note1: Measured with a PRBS 2^{31}-1 test pattern @10.3125Gbps BER<10^{-12}

Note2: Loss Of Signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

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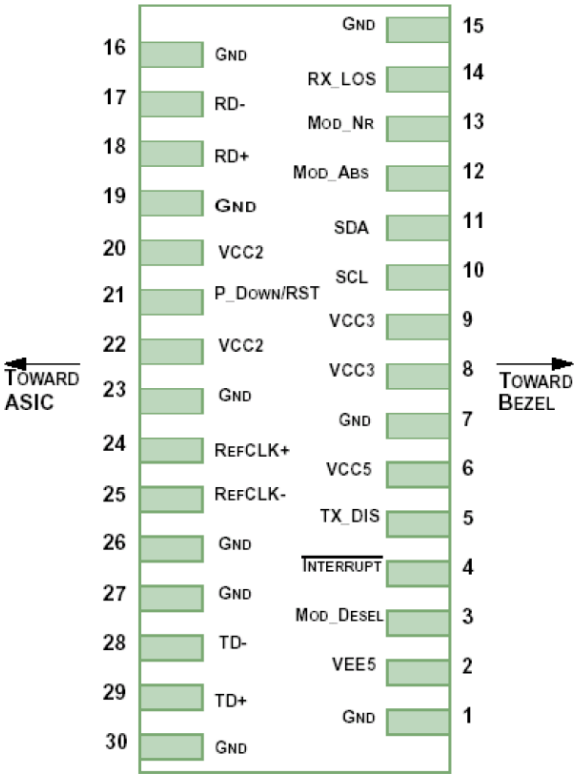
Pin Assignment



Host PCB XFP Pad Assignment

Pin Description

Pin	Logic	Name	Function / Description
1		GND	Module Ground
2		VEE5	Optional –5.2V Power Supply – **Not required**
3	LVTTL-I	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface
4	LVTTL-O	$\overline{\text{Interrupt}}$	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface
5	LVTTL-I	TX_DIS	Transmitter Disable; Transmitter laser source turned off
6		VCC5	+5V Power Supply – **Not required**
7		GND	Module Ground
8		VCC3	+3.3V Power Supply
9		VCC3	+3.3V Power Supply
10	LVTTL-I	SCL	Serial 2-wire interface clock

11	LVTTL-I/O	SDA	Serial 2-wire interface data line
12	LVTTL-O	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.
13	LVTTL-O	Mod_NR	Module Not Ready;
14	LVTTL-O	RX_LOS	Receiver Loss of Signal indicator
15		GND	Module Ground
16		GND	Module Ground
17	CML-O	RD-	Receiver inverted data output
18	CML-O	RD+	Receiver non-inverted data output
19		GND	Module Ground
20		VCC2	+1.8V Power Supply – **Not required**
21	LVTTL-I	P_Down/RST	Power Down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset
			Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.
22		VCC2	+1.8V Power Supply – **Not required**
23		GND	Module Ground
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – **Not required**
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board – **Not required**
26		GND	Module Ground
27		GND	Module Ground
28	CML-I	TD-	Transmitter inverted data input
29	CML-I	TD+	Transmitter non-inverted data input
30		GND	Module Ground

Note1: Module circuit ground is isolated from module chassis ground within the module.
Note2: Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15Vand 3.6V.
Note3: A Reference Clock input is not required.

Digital Diagnostic Functions

As defined by the XFP MSA, Ficer's XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

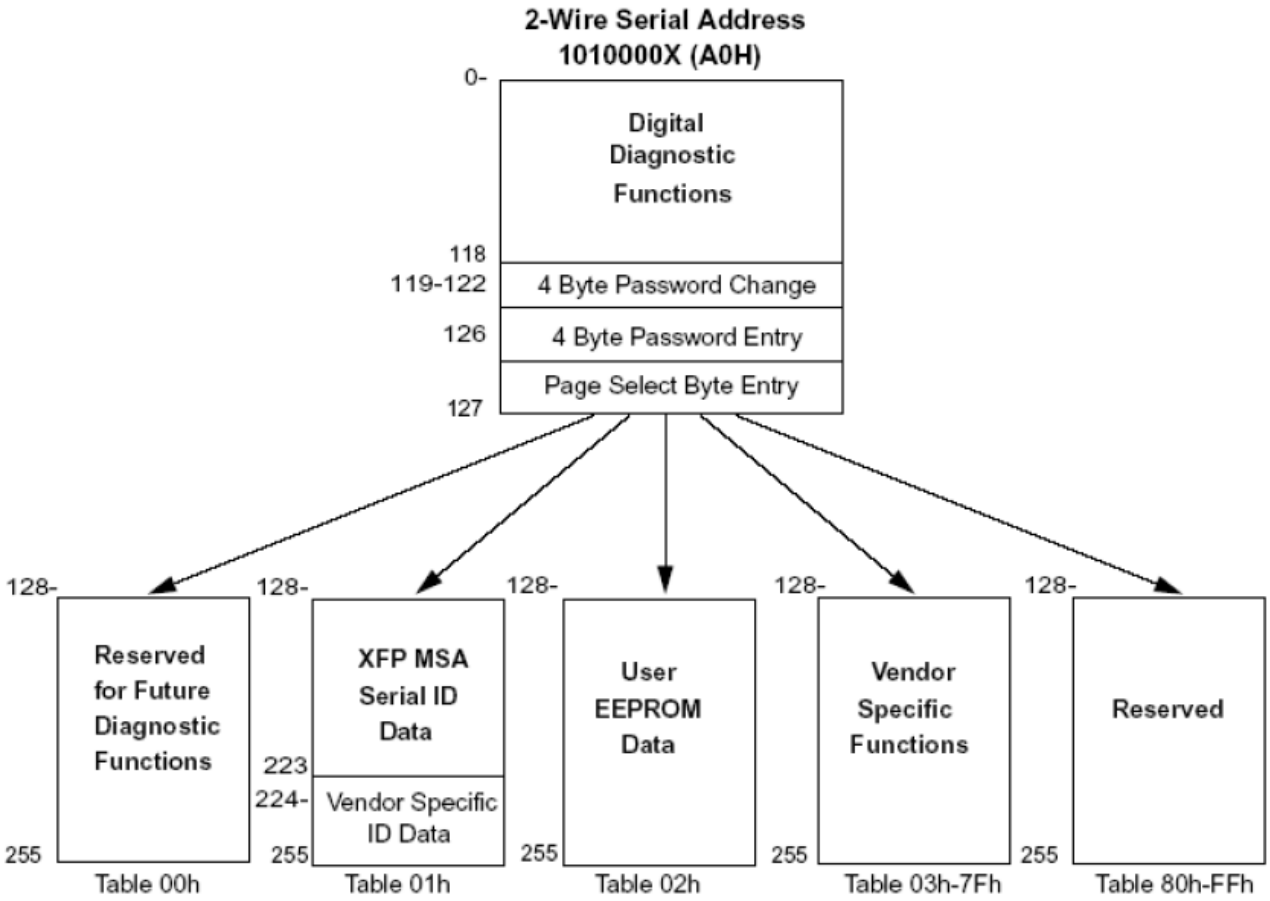
- Transceiver temperature
- Laser bias current
- Transmitted optical power
- Received optical power
- Transceiver supply voltage

It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Controller (DDC) inside the transceiver, which is accessed through the 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL pin) is generated by the host. The positive edge clocks data into the XFP transceiver into those segments of its memory map that are not write-protected. The negative edge clocks data from the XFP transceiver. The serial data signal (SDA pin) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 000h to the maximum address of the memory.

For more detailed information including memory map definitions, please see the XFP MSA Specification.

Digital Diagnostic Memory Map



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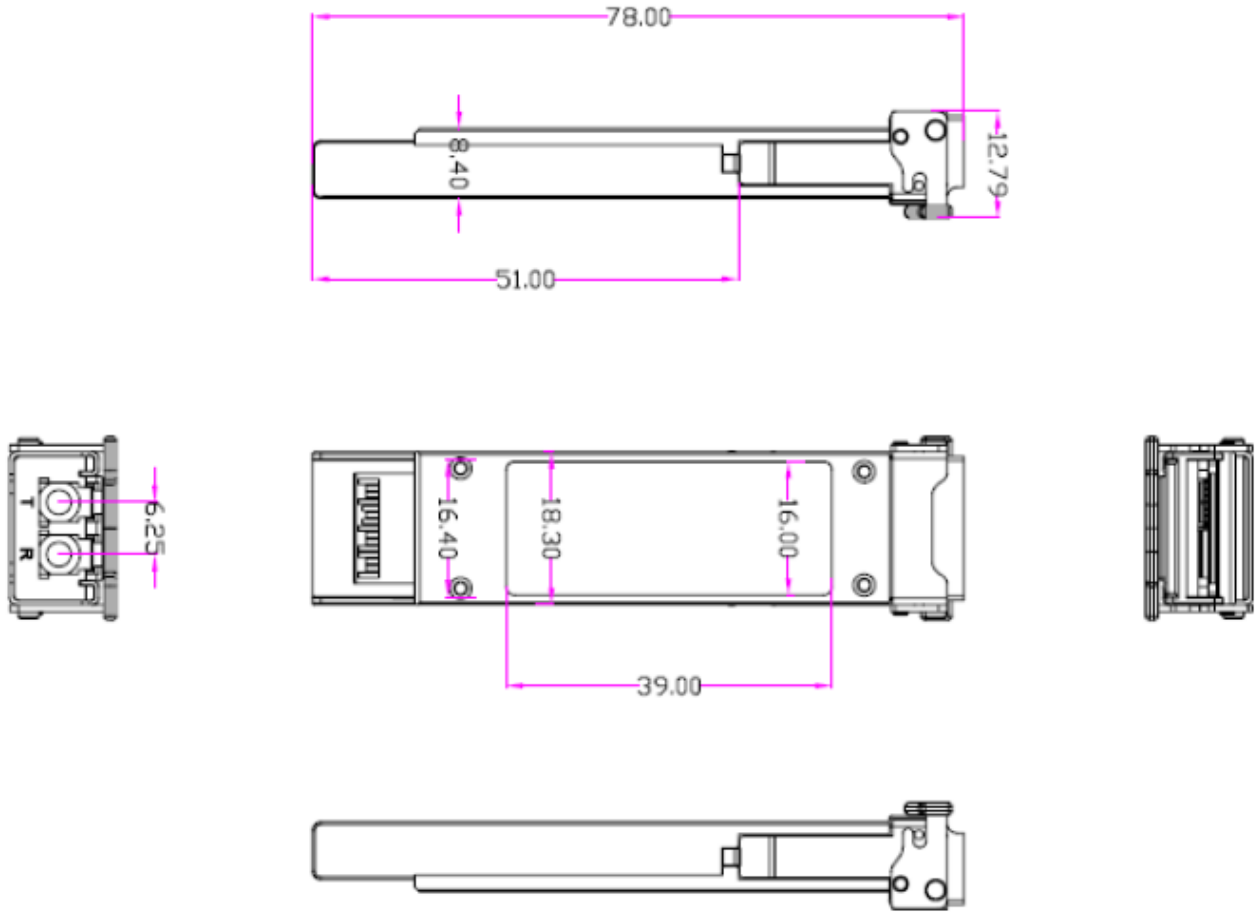
Mechanical Dimensions



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

Ordering Information

Part No.	Tx	Rx	Link	DDM	Temp.
FXFP-H7-M85-X3D	850nm	840nm ~ 860nm	MM OM4: 400m MM OM3: 300m MM OM2: 82m MM OM1: 33m	Yes	0~+70°C

Note: Distances are indicative only. To calculate a more precise link budget based on specific conditions in your application, please refer to the optical characteristics.

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