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10G X2-SR Transceiver
Hot Pluggable, Duplex SC, 850nm VCSEL, Multi-Mode, 300M, DDM

Part Number: FXF2-H1-M85-X3D

Overview

FXF2-H1-M85-X3D is a highly integrated serial optical transponder module for 10Gbit/s data transmission that is usable in typical router line card applications, Storage, IP network and LAN and compliant to X2 MSA. The MUX/DEMUX with clock and data recovery (CDR), XAUI interface and MDIO management functions are all integrated into the module. This transceiver uses a 850nm VCSEL Laser Diode to achieve 300m over multi-mode fiber as 10GBASE-SR of the IEEE 802.3ae.

Applications

- 10G Gigabit Ethernet

Features

- XAUI Electrical Interface: 4 Lanes @3.125Gb/s
- Hot Pluggable
- 850nm VCSEL transmitter
- Duplex SC connector
- MDIO Management Interface
- Support DDM function
- Link length up to 300m over Multi mode OM3 fiber
- Compliant to IEEE802.3ae 10GBASE-SR
- Compliant to X2 MSA
- 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 3.3V	V_{CC3}	0	+3.6	V
Supply Voltage 1.2V (APS)	V_{CC1}	0	+1.5	V

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Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage 3.3V	V_{CC3}	+3.14	+3.3	+3.47	V
Supply Voltage 1.2V (APS)	V_{CC1}	+1.15	+1.2	+1.25	V
Supply Current 3.3V	I_{CC3}			100	mA
Supply Current 1.2V (APS)	I_{CC1}			1100	mA
Module Total Power Consumption	Pc		1.7	2.4	W
Operating Case Temperature	T_C	0		70	°C

Transmitter Electro-optical Characteristics

V_{CC1}=1.15V to 1.25V, V_{CC3}= 3.14V to 3.47V, T_{OP} = 0 °C to 70 °C

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Date Rate	DR		10.3125		Gb/s	
Signaling speed variation from nominal		-100		+100	ppm	
Maximum Launch Power	PMAX	-3		-1	dBm	
Optical Center Wavelength	λ	840	850	860	nm	
Spectral Width	Δλ		0.4	0.45	nm	
Optical Extinction Ratio	ER	3.5			dB	
Off Transmitter Power	POFF			-28	dBm	
Dispersion Penalty	DP			3.9	dB	

Receiver Electro-optical Characteristics

V_{CC1}=1.15V to 1.25V, V_{CC3}= 3.14V to 3.47V, T_{OP} = 0 °C to 70 °C

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Date Rate	DR		10.3125		Gb/s	
Receiver Sensitivity (OMA)	SEN			-11.1	dBm	
Optical Center Wavelength	λ	840	850	860	nm	
Stressed Receiver Sensitivity (OMA)	P_{IN-S_min}			-7.5	dBm	
Maximum Receive Power	P_{RX-MAX}	+0.5			dBm	
Receiver Reflectance	Rrx			-12	dB	

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XAUI I/O Characteristics

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
XAUI Data Rate	DR		3.125		Gb/s	
XAUI Baud Rate Tolerance	P_{IN_min}	-100		+100	dBm	Relative Tolerance
Differential Input Voltage Swing	λ	220		1600	dBm	8B/10B Coded
Differential Output Voltage Swing	$P_{IN\text{-}S\_min}$	800		1600	dBm	RLoad=100Ω ± 5%
Differential Input Impedance	P_{IN_max}	80	100	120	Ω	
Total Output Jitter	Rrx			0.35	UI	no pre-equalization
Total Deterministic Output Jitter				0.17	UI	no pre-equalization

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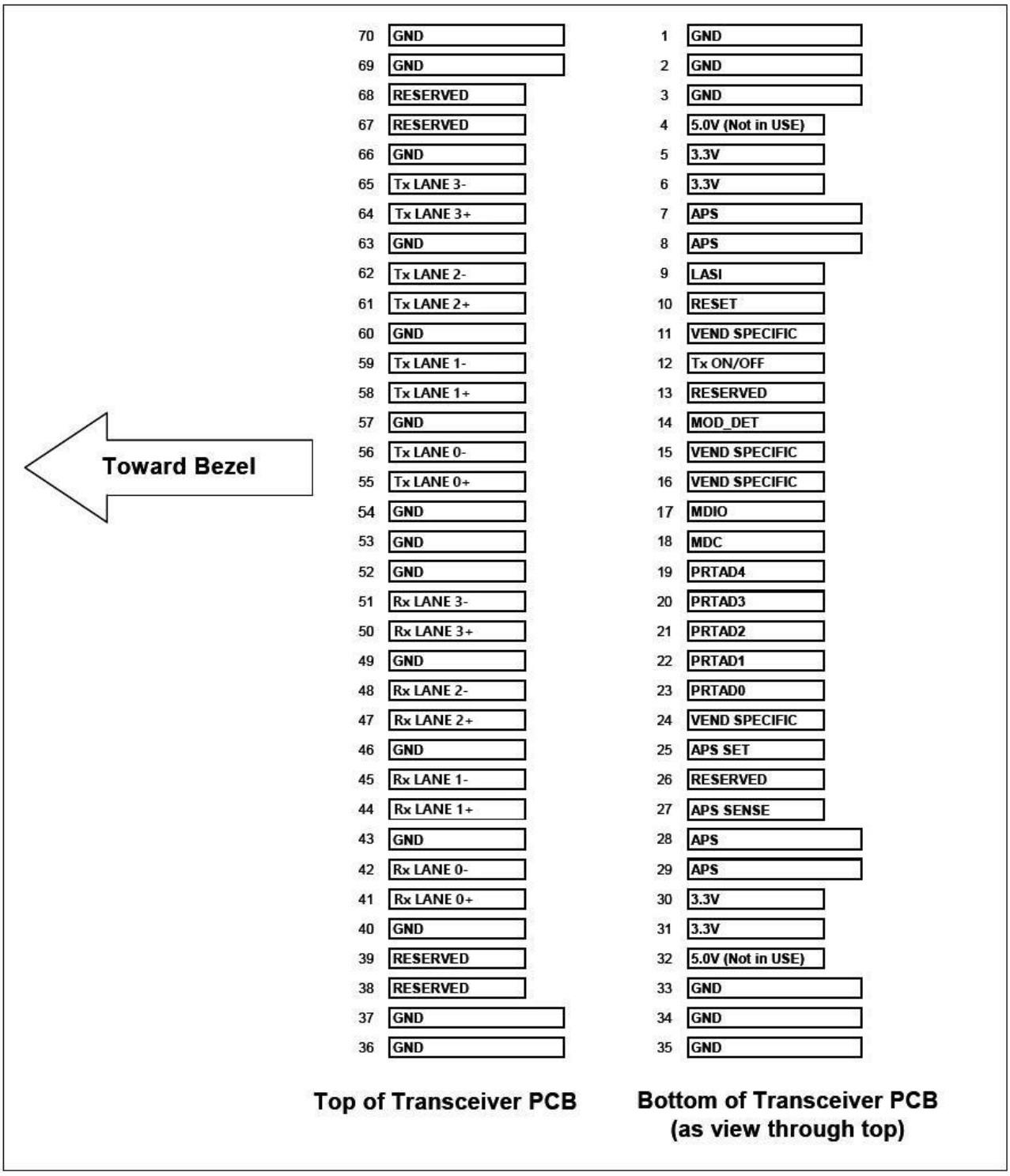
Pin Assignment



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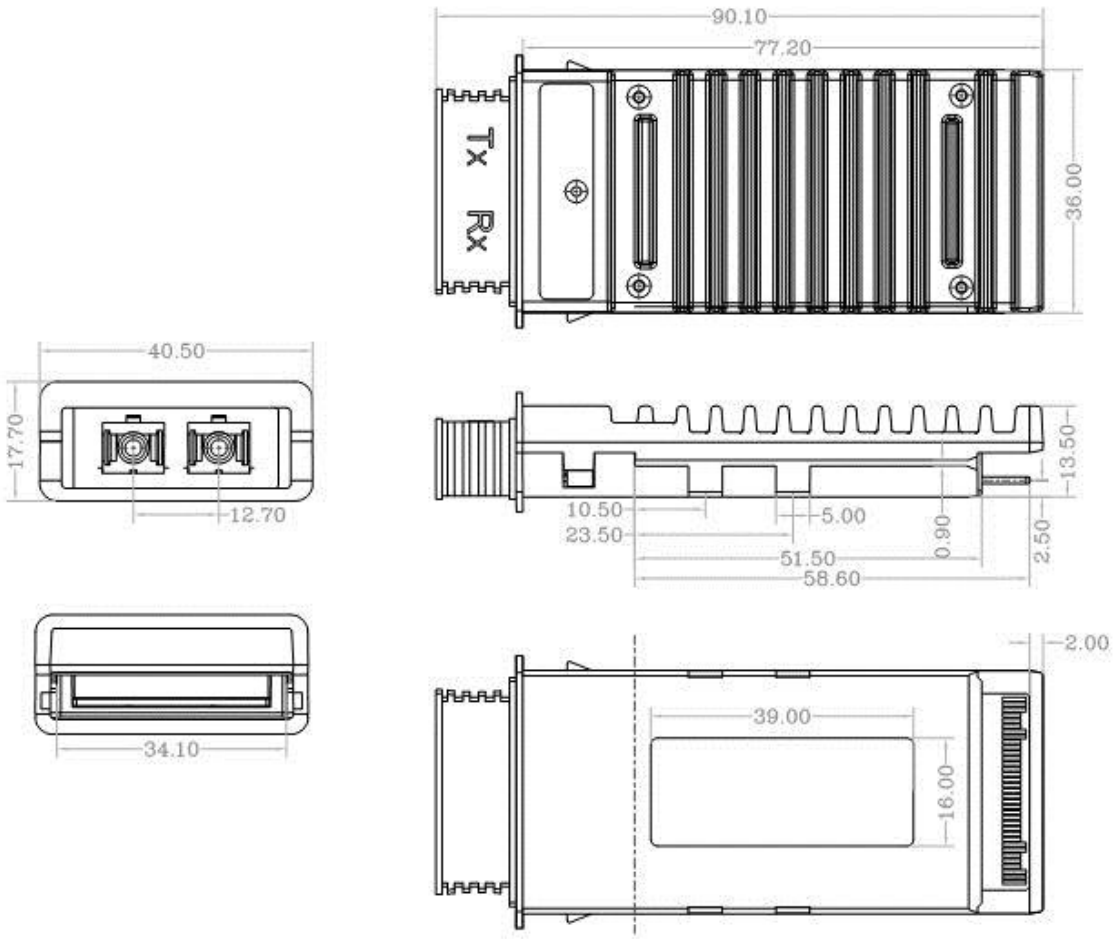
Pin Description

PIN	Name	Dir	Logic	Function	Note
1	GND			Electrical Ground	
2	GND			Electrical Ground	
3	GND			Electrical Ground	
4	5.0V			Power	
5	3.3V			Power	
6	3.3V			Power	
7	APS			Adaptive Power Supply	
8	APS			Adaptive Power Supply	
9	LASI	O	1.2V CMOS Open Drain	Link Alarm Status Interrupt, low active, Open Drain Output A pull-up resistor with 10-22KΩ to 1,2V is expected. Logic High: Normal Operation Logic Low: Link Alarm is indicated	
10	Reset	I	1.2V CMOS Open Drain	Low active Reset Input 10KΩ pull-up on Transceiver Logic high = Normal Operation Logic Low = Reset asserted	
11	VEND SPECIFIC			Vendor Specific Pin, leave unconnected	
12	Tx ON/OFF	I	1.2V CMOS Open Drain	High active Transmitter Enable Input 10KΩ pull-up on Transceiver Logic high = Transmitter active (normal Operation) And Register Bit 1.9.0 set to low as well Logic Low = shut down of Transmitter	
13	RESERVED			RESERVED	
14	MOD DETECT	O		1kΩ to Ground On Transceiver	
15	VEND SPECIFIC			Vendor Specific Pin, leave unconnected	
16	VEND SPECIFIC			Vendor Specific Pin, leave unconnected	
17	MDIO	I/O	1.2V CMOS	Management Data I/O. Requires external 10-22 kΩ pull-up to 1.2 V on host.	
18	MDC	I	1.2V CMOS	Management Clock Input	
19	PRTAD4	I		Port Address Bit 4(LOW=0)	
20	PRTAD3	I		Port Address Bit 3(LOW=0)	
21	PRTAD2	I		Port Address Bit 2(LOW=0)	
22	PRTAD1	I		Port Address Bit 1(LOW=0)	
23	PRTAD0	I		Port Address Bit 0(LOW=0)	

24	VEND SPECIFIC			Vendor Specific Pin, leave unconnected	
25	APS SET	I		Feedback Input for APS, Input of APS Setting Resistor	
26	RESERVED			RESERVED	
27	APS SENSE	O		APS Sense Output for APS Control Circuit	
28	APS			Adaptive Power Supply	
29	APS			Adaptive Power Supply	
30	3.3V			Power	
31	3.3V			Power	
32	5.0V			Power	
33	GND			Electrical Ground	
34	GND			Electrical Ground	
35	GND			Electrical Ground	
36	GND			Electrical Ground	
37	GND			Electrical Ground	
38	RESERVED			RESERVED	
39	RESERVED			RESERVED	
40	GND			Electrical Ground	
41	Rx LANE 0+			Module XAUI Output Lane 0+	
42	Rx LANE 0-			Module XAUI Output Lane 0-	
43	GND			Electrical Ground	
44	Rx LANE 1+			Module XAUI Output Lane 1+	
45	Rx LANE 1-			Module XAUI Output Lane 1-	
46	GND			Electrical Ground	
47	Rx LANE 2+			Module XAUI Output Lane 2+	
48	Rx LANE 2-			Module XAUI Output Lane 2-	
49	GND			Electrical Ground	
50	Rx LANE 3+			Module XAUI Output Lane 2+	
51	Rx LANE 3-			Module XAUI Output Lane 2-	
52	GND			Electrical Ground	
53	GND			Electrical Ground	
54	GND			Electrical Ground	
55	Rx LANE 0+			Module XAUI Output Lane 0+	
56	Rx LANE 0-			Module XAUI Output Lane 0-	
57	GND			Electrical Ground	

58	Tx LANE 1+			Module XAUI Output Lane 1+	
59	Tx LANE 1-			Module XAUI Output Lane 1-	
60	GND			Electrical Ground	
61	Tx LANE 2+			Module XAUI Output Lane 2+	
62	Tx LANE 2-			Module XAUI Output Lane 2-	
63	GND			Electrical Ground	
64	Tx LANE 3+			Module XAUI Output Lane 2+	
65	Tx LANE 3-			Module XAUI Output Lane 2-	
66	GND			Electrical Ground	
67	RESERVED			RESERVED	
68	RESERVED			RESERVED	
69	GND			Electrical Ground	
70	GND			Electrical Ground	

Mechanical Dimensions



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

Ordering Information

Part No.	Tx	Rx	Link	DDM	Temp.
FXF2-H1-M85-X3D	850nm	850nm	300m	Yes	0~70°C

Note1: 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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