



# 10Gigabit XFP Optical Receiver

## ***RTXM226-004***

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### Features

- *Compliant with XFP MSA*
- *Data Rate from 9.953 Gbps to 10.7Gbps*
- *PIN ROSA*
- *Industry-standard, protocol-independent XFI interface*
- *Power dissipation < 1.5W*
- *LC duplex receptacle package*
- *Low power dissipation*
- *Hot Pluggable*
- *Built in digital diagnostic Functions*
- *Operating case temperature range: 0°C ~ 70°C*

### Application

- *SONET OC-192 SR-1&SDH STM I-64.1*
- *10GBASE-LR/LW 10Gigabit*
- *Ethernet*
- *1200-SM-LL-L 10Gigabit Fiber Channel*

## Standard

- XFP MSA
- IEEE 802.3ae
- ITU-T G.691

## Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature	$T_s$	°C	-40	85
Supply Voltage 1	VCC3	V	-0.5	4.0
Supply Voltage 2	VCC5	V	-0.5	6.0

## Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Case Operating Temperature Range	$T_c$	°C	0		70
Supply Voltage 1	VCC3	V	3.13	3.3	3.45
Supply Voltage 2	VCC5	V	4.75	5.0	5.25

## Electrical Characteristics

*(Tested under recommended operating conditions, unless otherwise noted)*

Parameter	Symbol	Unit	Min	Typ	Max	Test condition
<b>Receiver</b>						
Output differential impedance	$R_{out}$	$\Omega$	-	100	-	1
Differential data output swing	$V_{out,pp}$	mV	600	700	800	2
Data output rise time	$T_r$	ps	24		34	3
Data output fall time	$T_f$	ps	24		34	3
LOS Fault	$V_{LOS\ fault}$	V	$V_{CC}-0.5$		$V_{CC\ HOST}$	4
LOS Normal	$V_{LOS\ norm}$	V	0		+0.5	4
Power Supply Rejection	PSR		See Note 5 below			5

**Note1:** After internal AC coupling.

**Note2:** Into 100 ohms differential termination.

**Note3:** 20-80%

**Note4:** 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.

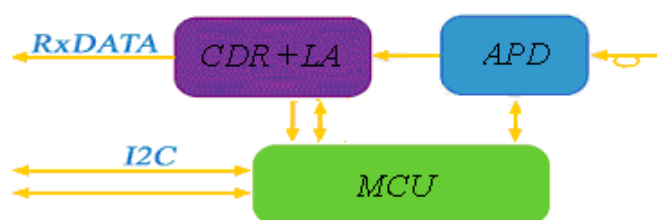
**Note5:** Per Section 2.7.1.in the XFP MSA Specification.

## Optical Characteristics

*(Tested under recommended operating conditions, unless otherwise noted)*

Parameter	Symbol	Unit	Min	Typ	Max	Test condition
<b>Optical transmitter Characteristics</b>						
Data rate		Gbps	9.95		10.7	
Receiver Sensitivity		dBm		-19	-18	1550nm, ER=10dB, Ber<10 <sup>-12</sup> , 2 <sup>31</sup> -1PRBS
Maximum input optical Power	P <sub>in-MAX</sub>	dBm	0.5			1550nm, ER=10dB, Ber<10 <sup>-12</sup> , 2 <sup>31</sup> -1PRBS
Optical Center Wavelength	λ <sub>c</sub>	nm	1280		1610	
Receiver Reflectance	R <sub>rx</sub>	dB			-14	
LOS De-Assert	LOS <sub>D</sub>	dBm			-18	
LOS Assert	LOS <sub>A</sub>	dBm	-30			
LOS Hysteresis		dB	0.5			

## Block Diagram



## Pin Description

Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground	1
2		VEE5	Optional -5.2V Power Supply <b>(Not Required)</b>	
3	LVTTL-I	Mod_DeSel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	LVTTL-O	Interrupt	Interrupt; Indicates presence of an important condition which can be read over the 2-wire serial interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output <b>(Not Required)</b>	
6		VCC5	+5V Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTL-I/O	SCL	2-Wire Serial Interface Clock	2
11	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line	2

12	LVTTL-O	Mod_Abs	Indicates Module is not present. Grounded in the Module	2
13	LVTTL-O	Mod_NR	Module Not Ready; Indicating Module Operational Fault	2
14	LVTTL-O	RX_LOS	Receiver Loss Of Signal Indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver Inverted Data Output	
18	CML-O	RD+	Receiver Non-Inverted Data Output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply( <b>Not Required</b> )	
21	LVTTL-I	P_Down/ RST	Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode.  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( <b>Not Required</b> )	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock Non-Inverted Input,AC coupled on the host board ( <b>Not Required</b> )	
25	PECL-I	RefCLK-	Reference Clock Inverted Input,AC coupled on the host board ( <b>Not Required</b> )	
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter Inverted Data Input ( <b>Not Required</b> )	
29	CML-I	TD+	Transmitter Non-Inverted Data Input ( <b>Not Required</b> )	
30		GND	Module Ground	1

**Note1:** Module ground pins GND are isolated from the module case and chassis ground within the module.

**Note2:** Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.

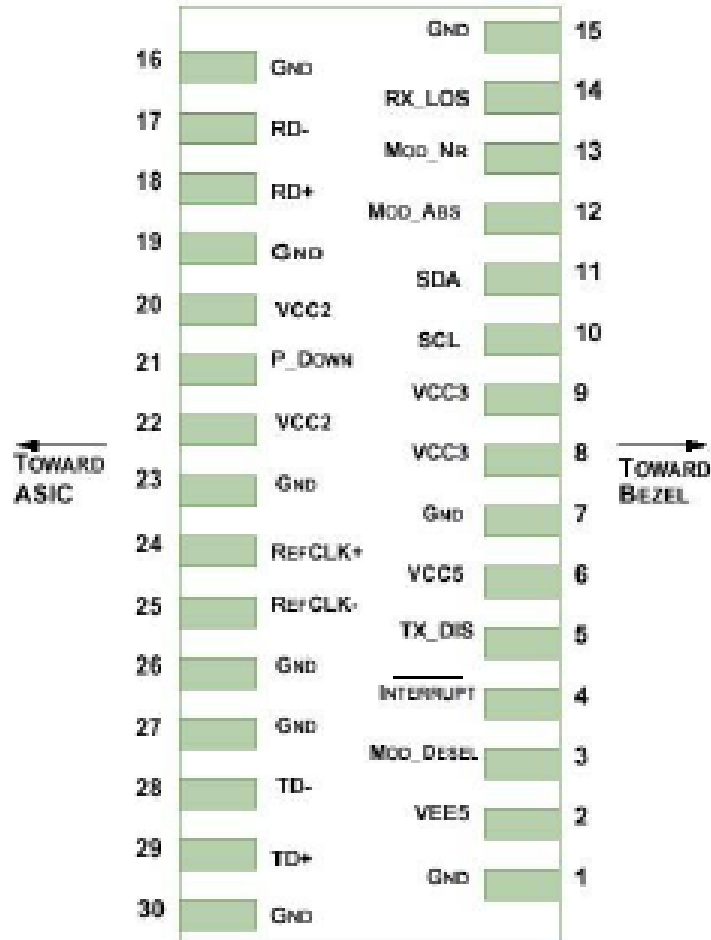
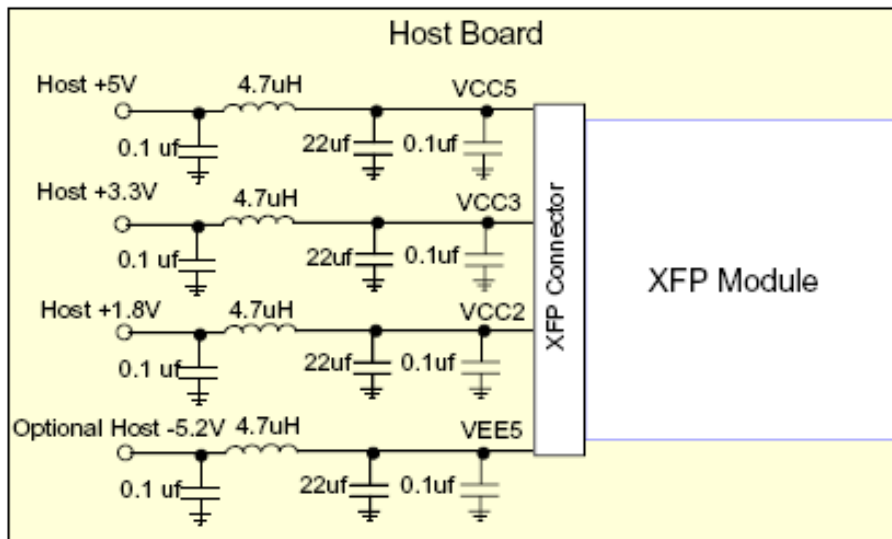


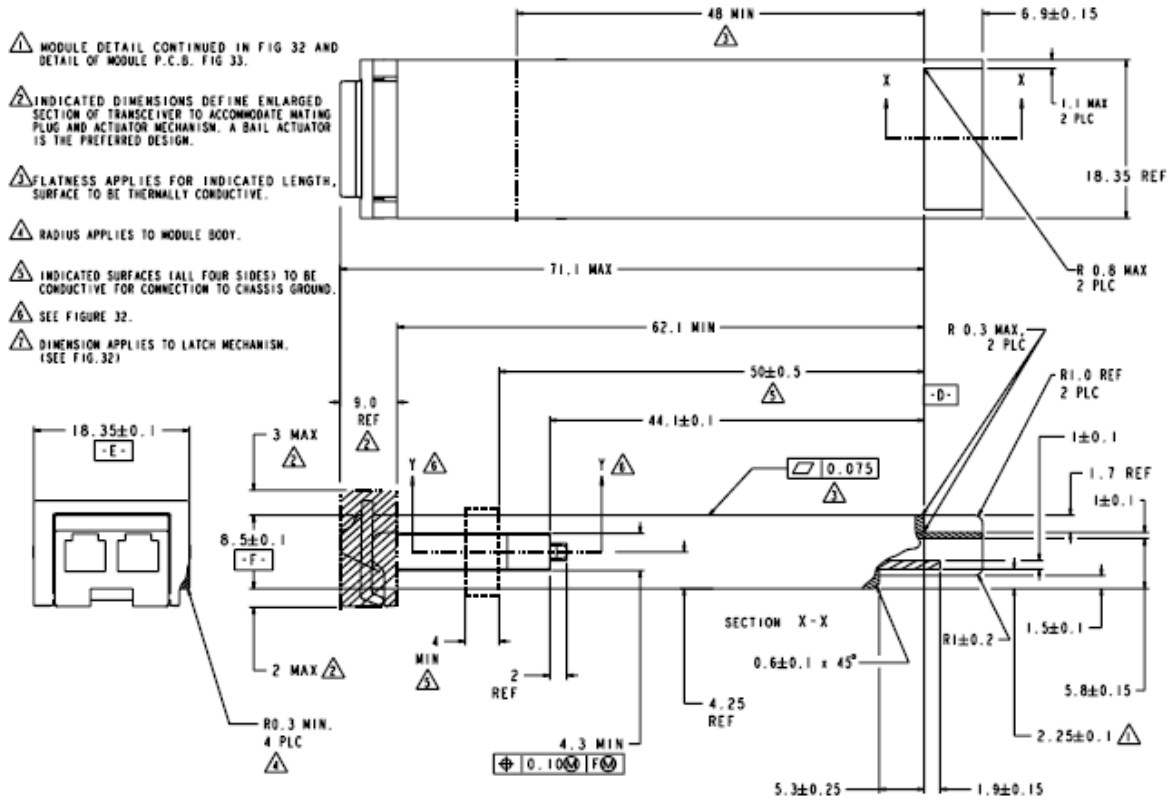
Diagram of Host Board Connector Block Pin Numbers and Names

## Typical Application Circuit



## Package Outline

WTD's XFP transceivers are compliant with the dimensions defined by the XFP Multi-Sourcing Agreement (MSA).



XFP Transceiver (dimensions are in mm)

## Regulatory Compliance

Feature	Test method	Performance
Electrostatic Discharge (ESD) to Electrical Pins	MIL-STD 883C, Method 3015.4 Human Body Model	TBD <sup>1</sup>
Electrostatic Discharge (ESD) to Optical Connector	IEC 61000-4-2; 1999	TBD <sup>1</sup>
Electromagnetic Interference (EMI)	FCC Part 15 Subpart J Class B, CISPR 22: 1997; EN 55022: 1998 Class B, VCCI Class I	Compliant with standards

**NOTE 1:** TBD: to be determined

## Ordering Information

Part No.	Specifications					Application
	Package	Data rate	Detector	Sensitivity	Temp	
RTXM226-004	XFP	10G	PIN	< -18dBm	0~70°C	SDH I-64.1, 10GBASE-LR/LW

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Edition 2009-12-01

Published by Wuhan Telecommunication Devices Co.,Ltd.

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