

# 10Gbps 70KM CWDM XFP Optical Transceiver RTXM226-69X



The RTX226-69X is a hot pluggable 10Gbps small-form-factor transceiver module integrated with the high performance cooled CWDM EML transmitter and high sensitivity APD receiver. It is compliant to INF-8077i XFP Multi-source Agreement(MSA). The module is a multirate optical transceiver, intended to support Telecom and Datacom applications.

## Features

- Data rate from 9.95 Gbps to 11.3Gbps
- CWDM EML TOSA and APD ROSA
- Industry-standard, protocol-independent, XFI interface
- Transmission distance up to 70km
- LC duplex receptacle package
- Hot pluggable
- Built in digital diagnostic functions
- Operating case temperature range:-40°C~85°C
- Low power consumption

## Applications

- CWDM Networks
- SONET OC-192&SDH STM 64
- 10Gigabit Ethernet
- 10Gigabit Fiber Channel

## Standards

- XFP MSA (INF-8077i)
- IEEE802.3ae
- ITU-T G.691

## Specifications

(Tested under recommended operating conditions, unless otherwise noted)

Parameter	Symbol	Unit	Value		
			Min	Typ	Max
Optical Transmitter Characteristics					
Data Rate	-	Gbps	9.95	-	11.1
Optical Power	P <sub>0</sub>	dBm	0	-	4
Center Wavelength Range	λ <sub>C</sub>	nm	1464.5		1617.5
Center Wavelength Spacing	Δλ <sub>D</sub>	nm	-6.5		6.5
Extinction Ratio	ER	dB	9	-	-
Spectral Width (-20dB)	Δλ	nm	-	-	0.3
SMSR	-	dB	30	-	-
Relative Intensity Noise	RIN	dB/Hz	-	-	-128
Eye Diagram	Compliant with ITU-T G.691				
Optical Receiver Characteristics					
Data Rate	-	Gbps	9.95	-	11.3
Center Wavelength Range	λ <sub>C</sub>	nm	1260	-	1620
Receiver Sensitivity <sup>2</sup>	S	dBm	-	-	-23
Receiver Sensitivity at 70km @ 1471~1551nm	S	dBm			-20
Receiver Sensitivity at 70km @1571~1611nm	S	dBm			-18
Overload Input Optical Power	-	dBm	-7	-	-
Receiver Reflectance	-	dB	-	-	-30
LOS	Optical Dessert	-	-	-	-27
	Optical Assert	-	-37	-	-
LOS Hysteresis	-	dB	0.5	-	6
Note1: 70KmSMF,9.95Gbps					
Note2:Ber<10 <sup>-12</sup> ,2 <sup>31</sup> -1 PRBS NRZ,CWDM,ER=9dB					

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## Ordering Information

Part No.	Specifications								
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity	Top	Reach	Others
RTXM226-69X	XFP	10G	CWDM EML	0 ~ 4dBm	APD	<-23dBm	-40~85°C	70km	DDM,RoHS

## Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Supply Voltage 1	V <sub>CC3</sub>	V	-0.5	4.0
Supply Voltage 2	V <sub>CC5</sub>	V	-0.5	6.0
Storage Temperature	T <sub>s</sub>	°C	-40	85
Operating Case Temperature	T <sub>c</sub>	°C	-40	85
Relative Humidity (Non condensation)	-	%	5	90

## Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Operating Case Temperature	T <sub>c</sub>	°C	-40	-	85
Supply Voltage 1	V <sub>CC3</sub>	V	3.13	3.3	3.47
Supply Current 1	I <sub>CC3</sub>	mA	-	-	750
Supply Voltage 2	V <sub>CC5</sub>	V	4.75	5.0	5.25
Supply Current 2	I <sub>CC5</sub>	mA	-	-	500
Power Dissipation	-	W	-	-	3.5

## Electrical Characteristics

(Tested under recommended operating conditions, unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Note
<b>Transmitter</b>						
Input Differential Impedance	R <sub>in</sub>	Ω	-	100	-	
Differential Data Input Swing	V <sub>in,pp</sub>	mV	120	-	1000	
Transmit Disable Voltage	VD	V	2.0	-	V <sub>CC3</sub>	
Transmit Enable Voltage	VEN	V	0	-	+0.8	
Transmit Disable Assert Time	-	μs	-	-	10	
<b>Receiver</b>						
Differential Data Output Swing	V <sub>out,pp</sub>	mV	400	-	800	
Data Output Rise Time	T <sub>r</sub>	ps	24	-	-	
Data Output Fall Time	T <sub>f</sub>	ps	24	-	-	
LOS Fault	-	V	V <sub>dd3</sub> -0.5	-	V <sub>dd3</sub>	1

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LOS Normal	-	V	0	-	+0.8	
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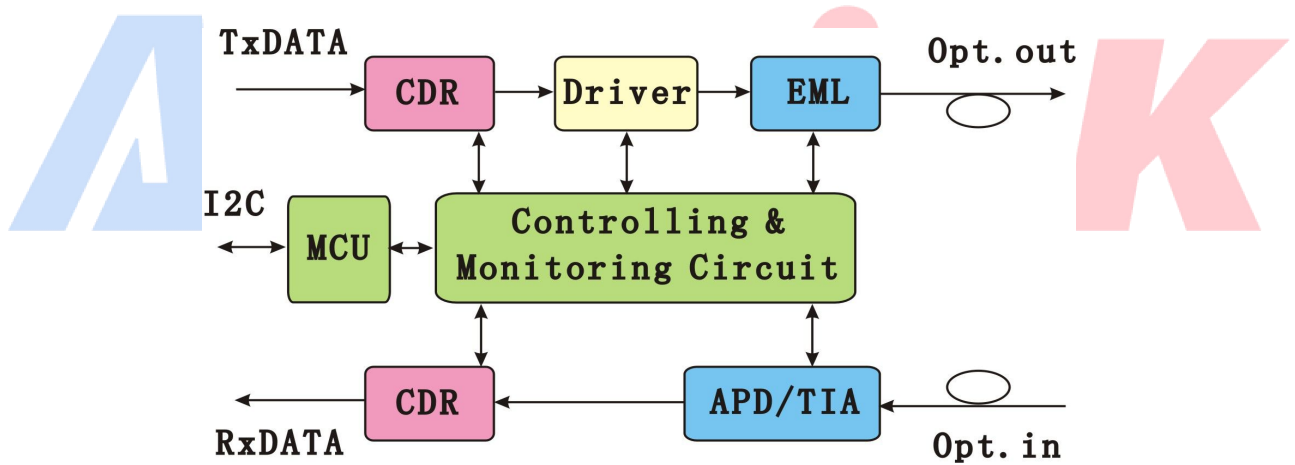
Note1:  $V_{dd3}$  is host +3.3V power supply.

## Low Speed Electrical Interface

Parameter	Symbol	Unit	Min	Max	Note
XFP Tx_Dis,P_Down/RST	$V_{IH}$	V	2.0	$V_{cc3}+0.3$	
	$V_{IL}$	V	-0.3	0.8	
XFP Interrupt,Mod_NR,Rx_Los	$V_{OH}$	V	$V_{dd3}-0.5$	$V_{dd3}+0.3$	1
	$V_{OL}$	V	0.0	0.4	
XFP SCL and SDA Input	$V_{IH}$	V	$V_{dd3}*0.7$	$V_{dd3}+0.5$	1
	$V_{IL}$	V	-0.3	$V_{dd3}*0.3$	
XFP SCL and SDA Output	$V_{OH}$	V	$V_{dd3}-0.5$	$V_{dd3}+0.3$	
	$V_{OL}$	V	0.0	0.4	
Leakage Current	$I_L$	$\mu A$	-10	10	
I <sup>2</sup> C Clock Rate		KHz		400	

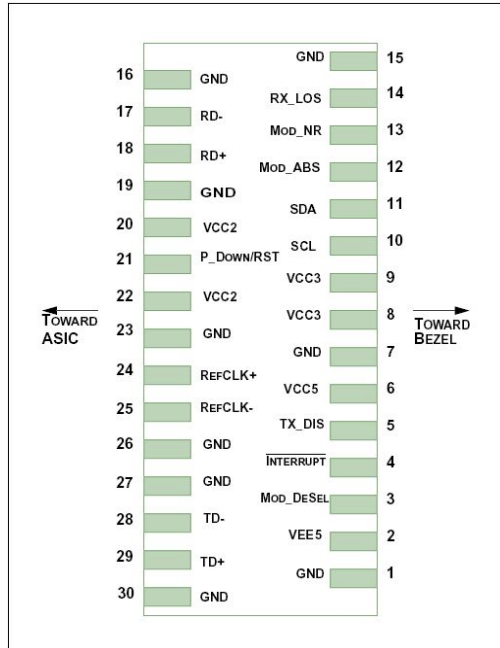
Note1:  $V_{dd3}$  is host +3.3V power supply.

## Block Diagram



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## Pin Description



Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground	1
2		VEE5	Optional -5.2V Power Supply (Not Required)	
3	LVTTL-I	Mod_DeSel	Module De-select; When held low allows module to respond to 2-wire serial interface	
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	
6		VCC5	+5V Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	I/O	SCL	2-Wire Serial Interface Clock	2
11	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 (Not Required)	

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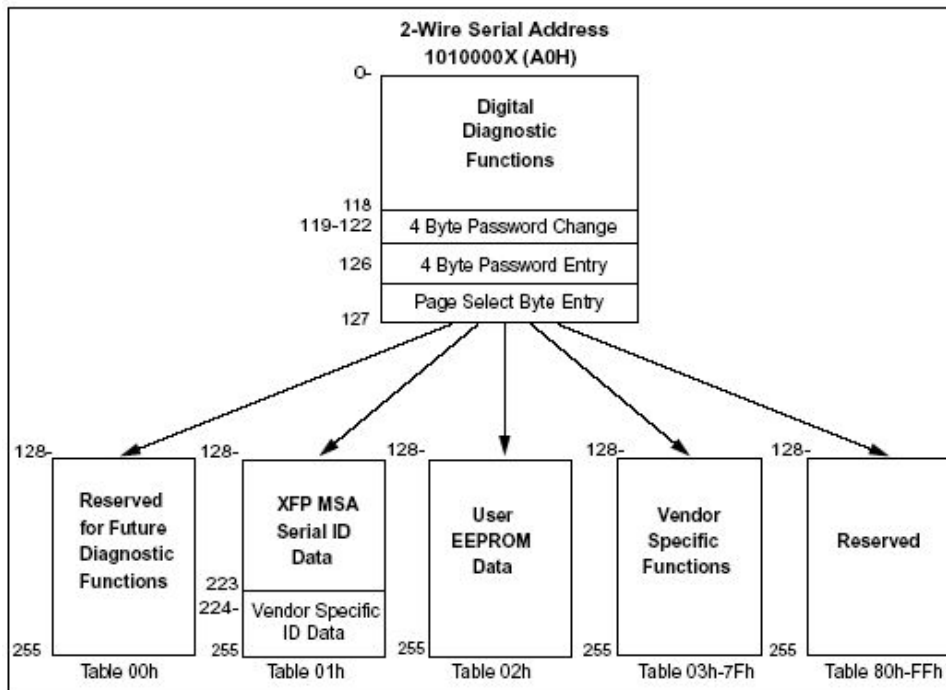
21	LVTTTL-I	P_Down/RST	Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode. Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22		VCC2	+1.8V Power Supply (Not Required)	
23		GND	Module Ground	1
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	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter Inverted Data Input	
29	CML-I	TD+	Transmitter Non-Inverted Data Input	
30		GND	Module Ground	1
<p>Note1: Module ground pins GND are isolated from the module case and chassis ground within the module.</p> <p>Note2: Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.</p>				

## Digital Diagnostic Functions

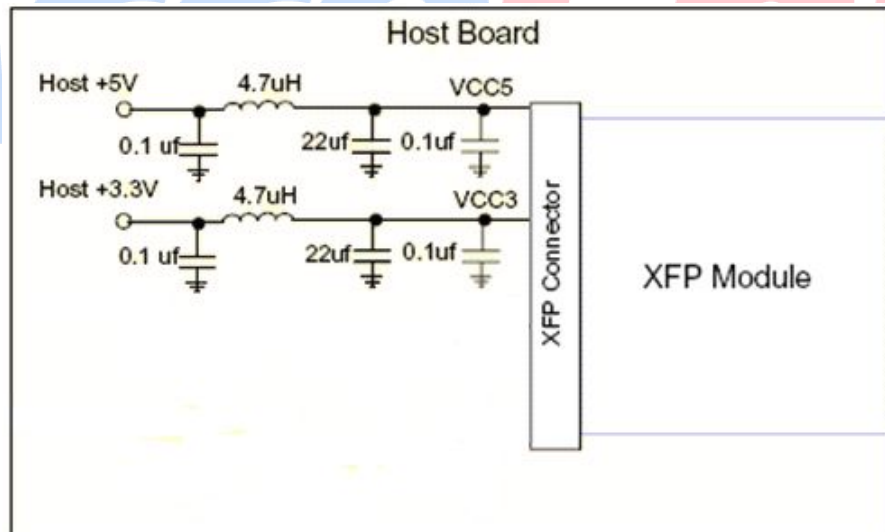
As defined by the XFP MSA, digital diagnostic functions are provided via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- Transceiver Temperature
- Tx Bias Current
- Tx Optical Power
- RX Received Optical Power
- Transceiver +3.3V Supply Voltage
- Laser Temperature

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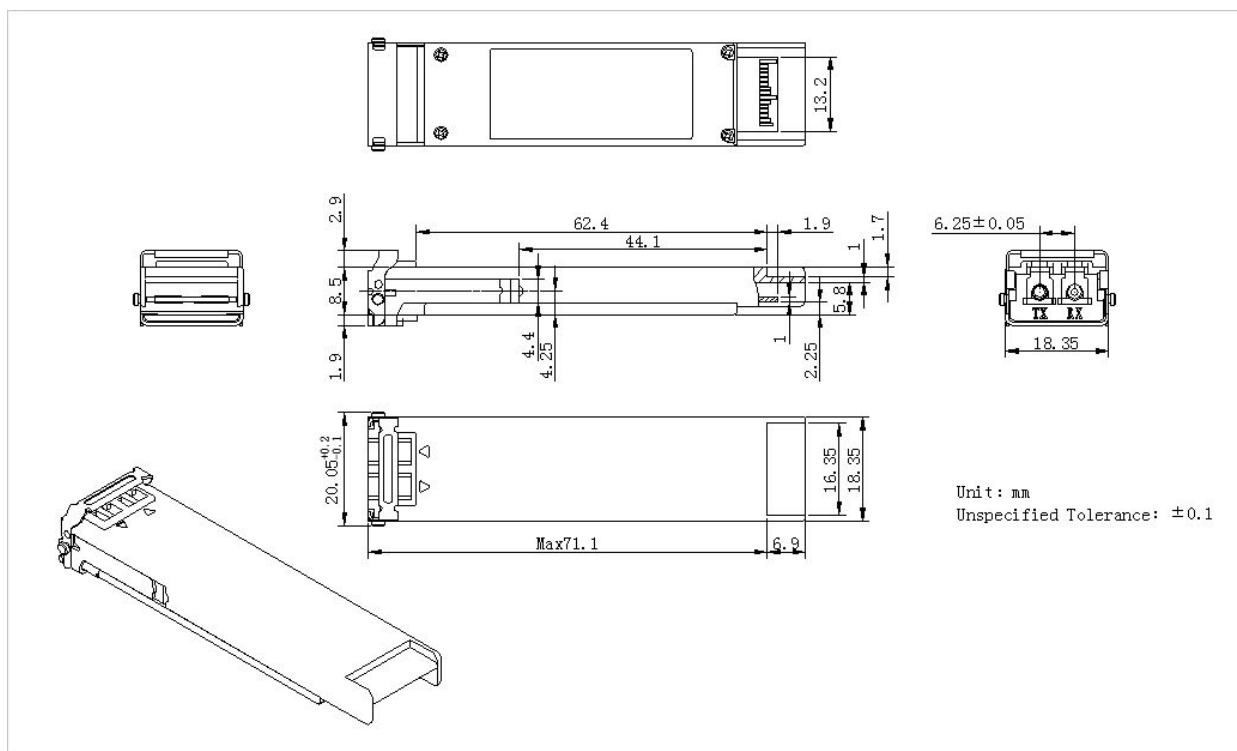


## Typical Application Circuit for Power Supply



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## Package Outline



## Regulatory Compliance

Feature	Test Method	Performance
Laser Eye Safety	FDA 21 CFR 1040.10 and 1040.11 IEC 60825-1: 1994+ A11: 1996+ A2: 2001 IEC 60825-2: 2004 + A1: 2006 EN 60825-1:1994+A1:2002+A2:2001 EN 60825-2: 2004	Compliant with Class 1 laser product
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7 Human Body Model	Class 1 (>1.5kV)
Electrostatic Discharge (ESD) Immunity	IEC 61000-4-2: 2001	Class 2 (>4.0kV)
Electromagnetic Interference (EMI)	FCC Part 15 Subpart J Class B CISPR22:1997+A1:2000+A2:2002, Class B EN55022:1998+A1:2000+A2:2003, Class B	Compliant with standards

# 10Gbps 70KM CWDM XFP Optical Transceiver RTXM226-69X

Product Code	Center Wavelength(nm)
RTXM226-691	1471
RTXM226-692	1491
RTXM226-693	1511
RTXM226-694	1531
RTXM226-695	1551
RTXM226-696	1571
RTXM226-697	1591
RTXM226-698	1611

The logo for AcceLink features the word "Acce" in a light blue, sans-serif font, followed by "link" in a red, italicized, sans-serif font. A small red circle is positioned above the dot of the 'i' in "link".