

10Gbps XFP Optical Transceiver RTX226-5XX



The RTX226-5XX is a hot pluggable 10Gbps small-form-factor transceiver module integrated with the high performance cooled DWDM-rated EML transmitter and high sensitivity PIN 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
- 100GHz ITU Grid, C Band
- DWDM-rated EML TOSA and PIN ROSA
- Industry-standard, protocol-independent, XFI interface
- Transmission distance up to 40km
- LC duplex receptacle package
- Hot pluggable
- Built in digital diagnostic functions
- Operating case temperature range:-5°C~70°C
- RoHS compliant

Applications

- DWDM 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	-	11.3
Optical Power		P ₀	dBm	-1	-	2
Center Wavelength Range		λ _c	nm	1528.77		1563.05
Center Wavelength Spacing			GHz		100	
Wavelength Tolerance			pm	-50		+50
Extinction Ratio		ER	dB	8.2	-	-
Spectral Width (-20dB)		Δλ	nm	-	-	0.3
SMSR		-	dB	35	-	-
Relative Intensity Noise		RIN	dB/H _z	-	-	-128
Eye Diagram		Compliant with ITU-T G.691				
Dispersion Penalty ¹		-	dB	-	-	2
Optical Receiver Characteristics						
Data Rate		-	Gbps	9.95	-	11.3
Center Wavelength Range		λ _c	nm	1260	-	1610
Receiver Sensitivity ²		S	dBm	-	-	-16
Overload Input Optical Power		-	dBm	-1	-	-
LOS	Optical Dessert	-	dBm	-	-	-21
	Optical Assert	-		-32	-	-24
LOS Hysteresis		-	dB	0.5	-	6
Note1: 50kmSMF,9.95Gbps						
Note2:BER<10 ⁻¹² ,2 ³¹ -1 PRBS NRZ,1550nm,ER=8.2dB						

10Gbps XFP Optical Transceiver RTX226-5XX

Ordering Information

Part No.	Specifications								
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity	Top	Reach	Others
RTXM226-5XX	XFP	10G	DWDM-rated EML	-1 ~ 2dBm	PIN	<-16dBm	-5~70°C	40km	DDM,RoHS

Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Supply Voltage 1	V _{CC3}	V	-0.5	4.0
Supply Voltage 2	V _{CC5}	V	-0.5	6.0
Storage Temperature	T _s	°C	-40	85
Operating Case Temperature	T _c	°C	-5	70
Relative Humidity (Non condensation)	-	%	5	90

Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Operating Case Temperature	T _c	°C	-5	-	70
Supply Voltage 1	V _{CC3}	V	3.13	3.3	3.47
Supply Current 1	I _{CC3}	mA	-	-	750
Supply Voltage 2	V _{CC5}	V	4.75	5.0	5.25
Supply Current 2	I _{CC5}	mA	-	-	500
Power Dissipation	-	W	-	-	3.5

Electrical Characteristics

(Tested under recommended operating conditions, unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Note
Transmitter						
Input Differential Impedance	R _{in}	Ω	-	100	-	
Differential Data Input Swing	V _{in,pp}	mV	120	-	1000	
Transmit Disable Voltage	V _D	V	2.0	-	V _{cc3}	
Transmit Enable Voltage	V _{EN}	V	0	-	+0.8	
Transmit Disable Assert Time	-	μs	-	-	10	
Receiver						
Differential Data Output Swing	V _{out,pp}	mV	400	-	800	
Data Output Rise Time	T _r	ps	24	-	-	
Data Output Fall Time	T _f	ps	24	-	-	
LOS Fault	-	V	V _{dd3} -0.5	-	V _{dd3}	1
LOS Normal	-	V	0	-	+0.5	
Note1: V _{dd3} is host +3.3V power supply.						

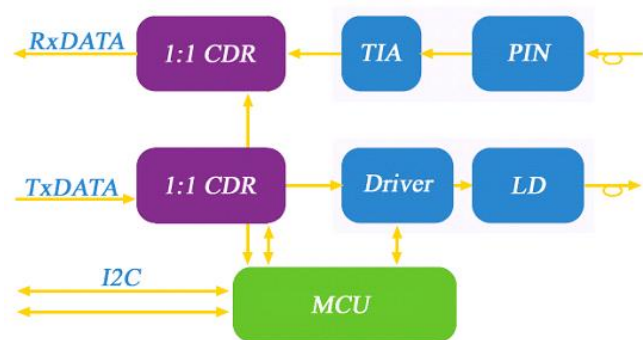
10Gbps XFP Optical Transceiver RTX226-5XX

Low Speed Electrical Interface

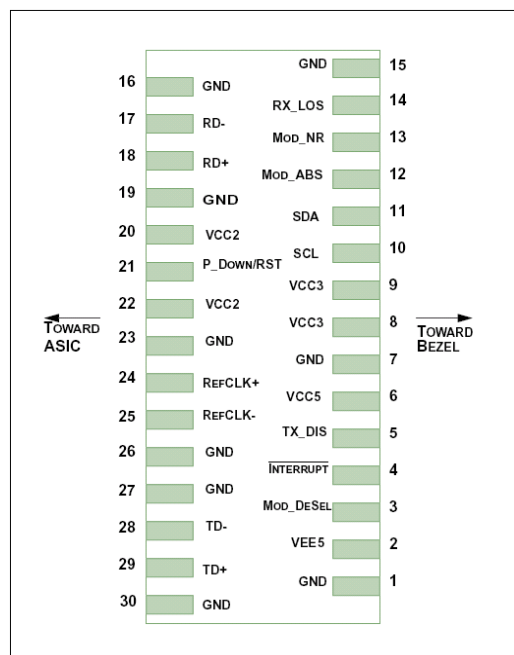
Parameter	Symbol	Unit	Min	Max	Note
XFP Tx_Dis,P_Down/RST	V_{IH}	V	2.0	$V_{cc3}+0.3$	
	V_{IL}	V	-0.3	0.8	
XFP Interrupt,Mod_NR,Rx_Los	V_{OH}	V	$V_{dd3}-0.5$	$V_{dd3}+0.3$	1
	V_{OL}	V	0.0	0.4	
XFP SCL and SDA Input	V_{IH}	V	$V_{dd3}*0.7$	$V_{dd3}+0.5$	1
	V_{IL}	V	-0.3	$V_{dd3}*0.3$	
XFP SCL and SDA Output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

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

Block Diagram



Pin Description



10Gbps XFP Optical Transceiver RTX226-5XX

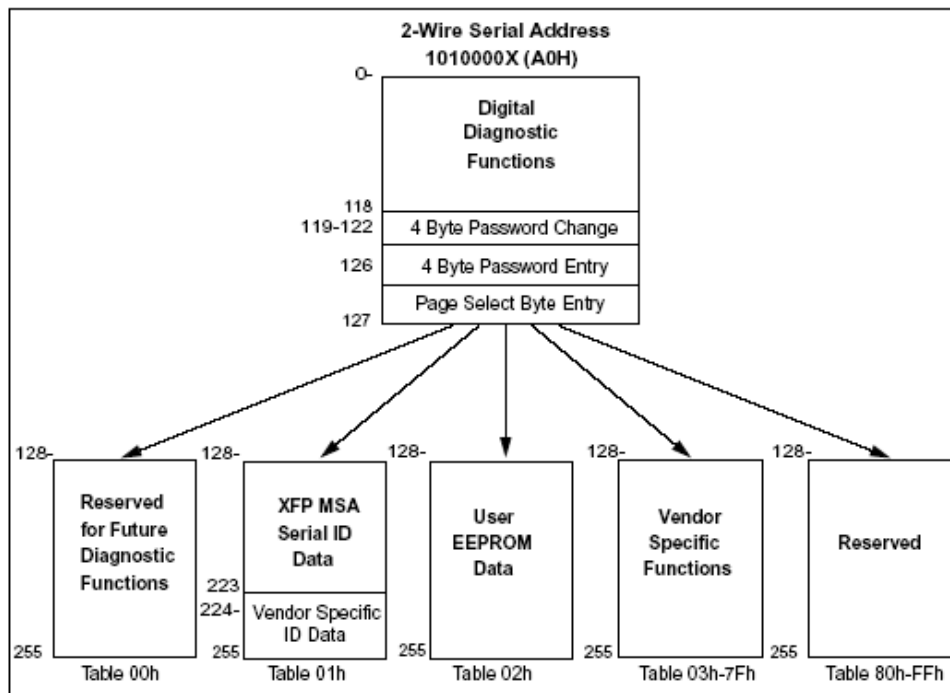
Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground	1
2		VEE5	Optional -5.2V Power Supply (Not Required)	
3	LVTTTL-I	Mod_DeSel	Module De-select; When held low allows module to respond to 2-wire serial interface	
4	LVTTTL-O	----- Interrupt	----- Interrupt; Indicates presence of an important condition which can be read over the 2-wire serial interface	2
5	LVTTTL-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	LVTTTL-O	Mod_Abs	Indicates Module is not present. Grounded in the Module	2
13	LVTTTL-O	Mod_NR	Module Not Ready; Indicating Module Operational Fault	2
14	LVTTTL-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)	
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
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.				

10Gbps XFP Optical Transceiver RTX226-5XX

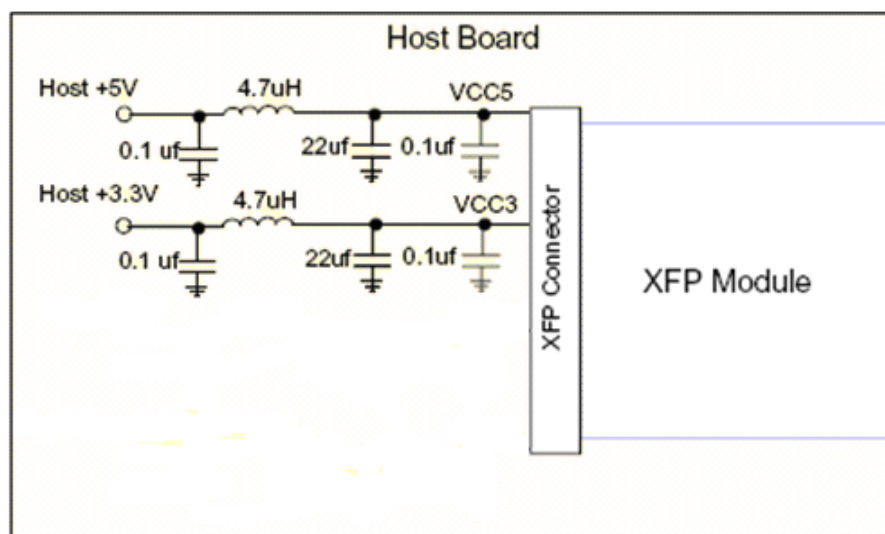
Digital Diagnostic Functions

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

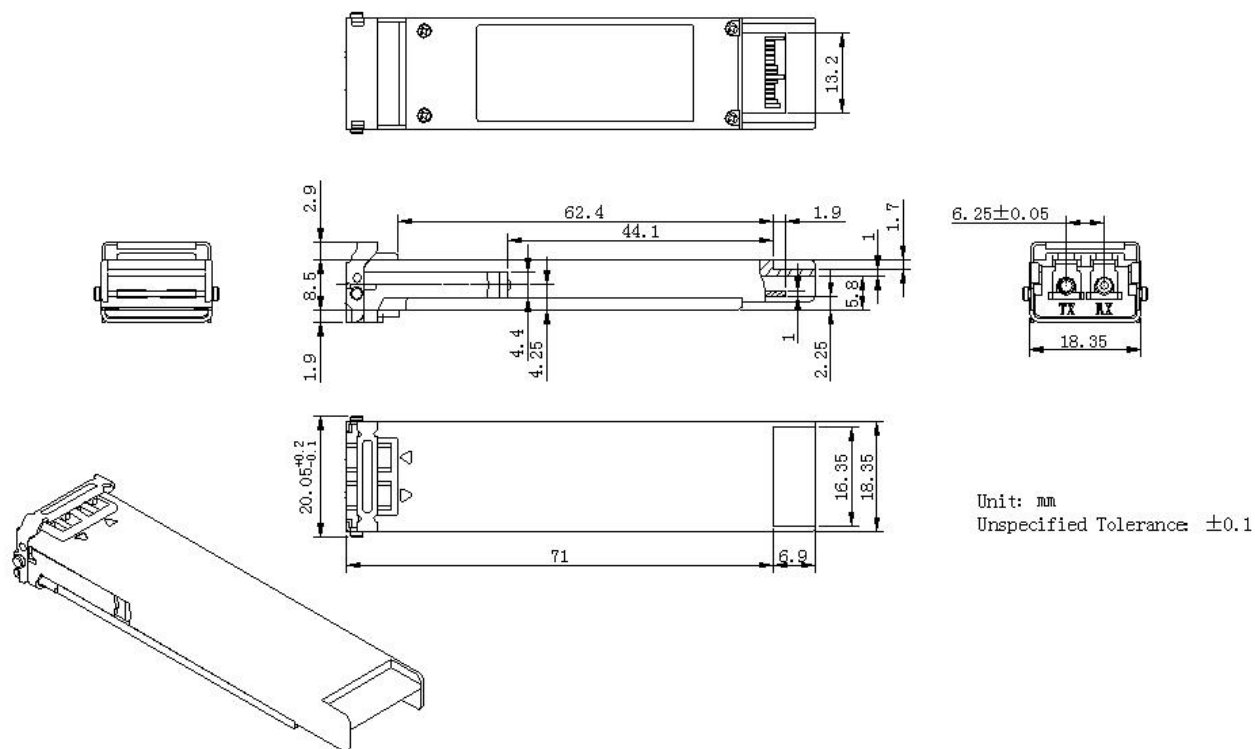


Typical Application Circuit for Power Supply



10Gbps XFP Optical Transceiver RTX226-5XX

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 XFP Optical Transceiver RTX226-5XX

Product Code	Frequency(THz)	Center Wavelength(nm)
RTXM226-518	191.8	1563.05
RTXM226-519	191.9	1562.23
RTXM226-520	192.0	1561.42
RTXM226-521	192.1	1560.61
RTXM226-522	192.2	1559.79
RTXM226-523	192.3	1558.98
RTXM226-524	192.4	1558.17
RTXM226-525	192.5	1557.36
RTXM226-526	192.6	1556.55
RTXM226-527	192.7	1555.75
RTXM226-528	192.8	1554.94
RTXM226-529	192.9	1554.13
RTXM226-530	193.0	1553.33
RTXM226-531	193.1	1552.52
RTXM226-532	193.2	1551.72
RTXM226-533	193.3	1550.92
RTXM226-534	193.4	1550.12
RTXM226-535	193.5	1549.32
RTXM226-536	193.6	1548.51
RTXM226-537	193.7	1547.72
RTXM226-538	193.8	1546.92
RTXM226-539	193.9	1546.12
RTXM226-540	194.0	1545.32
RTXM226-541	194.1	1544.53
RTXM226-542	194.2	1543.73
RTXM226-543	194.3	1542.94
RTXM226-544	194.4	1542.14
RTXM226-545	194.5	1541.35
RTXM226-546	194.6	1540.56
RTXM226-547	194.7	1539.77
RTXM226-548	194.8	1538.98
RTXM226-549	194.9	1538.19
RTXM226-550	195.0	1537.40
RTXM226-551	195.1	1536.61
RTXM226-552	195.2	1535.82
RTXM226-553	195.3	1535.04
RTXM226-554	195.4	1534.25
RTXM226-555	195.5	1533.47
RTXM226-556	195.6	1532.68
RTXM226-557	195.7	1531.90
RTXM226-558	195.8	1531.12
RTXM226-559	195.9	1530.33
RTXM226-560	196.0	1529.55
RTXM226-561	196.1	1528.77