



## FTX-S1XG-DxxL-14BD

XFP 10Gbps, DWDM, single-mode, 14dB



### Description

FTX-S1XG-DxxL-14BD series XFP transceiver can be used to establish multiple, high speed serial data links over single-mode fiber. Thanks to adoption of DWDM technology it is possible to send up to 45 separate data streams over single strain of fiber\*\*\*. At least 14dB optical power budget is guaranteed. Transceivers are fully compliant with XFP MSA specifications and are available in various hardware versions:

\*\*\*45 pairs of DWDM modules and two pairs of optical multiplexer and demultiplexer devices will be required

Model(generic part number)	Operating case temperature
FTX-S1XG-DxxL-14BD	0~70°C
FTX-S1XG-DxxL-14BDI	-40~85°C

xx – indicates central wavelength, must be specified while ordering module, more info available in Ordering Information chapter

Host device can access module internal EEPROM memory and DDMI via I<sup>2</sup>C interface.

Built-in digital diagnostic interface (DOM, DDMI) allows a network administrator to monitor module parameters such as: transmitted and received optical power, temperature, supply voltage and laser current. Those information and data are very helpful e.g. in prediction and prevention of connection failures. A module is available in various dedicated versions, which can be compatible with devices from vendors such as Cisco, HP, Juniper, Extreme Networks, Alcatel-Lucent, 3Com, Linksys and more.

### Applications

- 10G Ethernet
- Fiber Channel (10G FC)
- SONET/SDH (OC-192/STM64)



## Key features

- LC Duplex receptacle
- Transmission distance up to 40km\*
- EML DWDM laser diode, PIN receiver (100 GHz grid, C-Band)
- Throughput up to 11.3Gb/s
- Fully compliant with XFP MSA INF-8077i and INF-8472 rev. 11.3
- Hot-Pluggable
- RoHS compliant
- Class 1 laser safety
- Low power dissipation (<1W)
- Metal case for low EMI
- Operating case temperature\* : 0~70°C / -40~85°C

## Specification

### Supported transmission technology

10G Ethernet, Fibre Channel

### Speed supported for Ethernet technology

10.25Gbps, 1.25Gbps

### Speed supported for Fibre Channel technology

10.51875Gbps

### Transmission medium

Single-mode fiber 9/125μm

### Transmission distance\*\*

40km

### Receptacle type

LC Duplex

### Wavelength

DWDM 100 GHz grid, C-Band

### Output power

-1~+4dBm

### Receiver sensitivity

-15dBm

### Power supply voltage

3.3V

### Total power consumption

< 1W

### Operating environment – temperature\*

0~70°C / -40~+85°C

### Operating environment - humidity

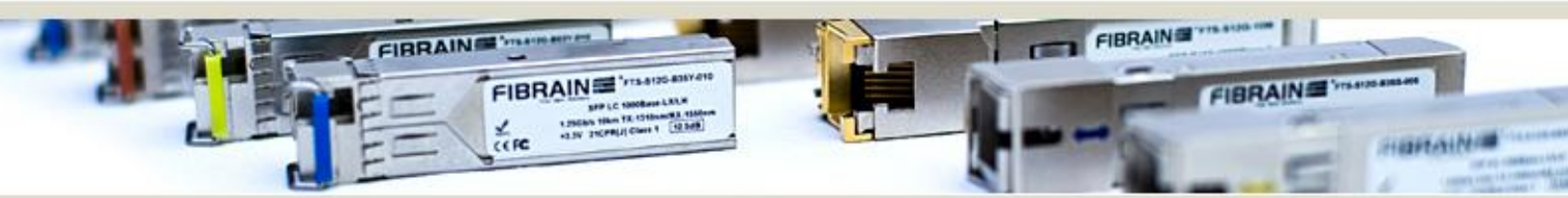
5~95% non-condensing

### Dimensions

Compliant with XFP Multi-Source Agreement

\* - standard / industrial version

\*\* - transmission distance depends on optical link attenuation (at selected wavelength)



## Detailed technical specification

### Pin Description

Pin	Name	Function/Description	Logic	Notes
1	GND	Module Ground		1
2	V <sub>EE5</sub>	Optional -5.2V Power Supply - <b>Not Required</b>		-
3	Mod_DeSel	Module De-select; When held low allows module to respond to 2-wire serial interface	LVTTTL-I	-
4	Interrupt	Interrupt; Indicates presence of an important condition	LVTTTL-0	2
5	TX_DIS	Transmitter Disable; Turns off transmitter laser output	LVTTTL-I	-
6	V <sub>CC5</sub>	+5V Power Supply - <b>Not Required</b>		-
7	GND	Module Ground		1
8	V <sub>CC3</sub>	+3.3V Power Supply		-
9	V <sub>CC3</sub>	+3.3V Power Supply		-
10	SCL	2-Wire Serial Interface Clock	LVTTTL-I/O	2
11	SDA	2-Wire Serial Interface Data Line	LVTTTL-I/O	2
12	Mod_Abs	Indicates Module is not present. Grounded in the Module	LVTTTL-0	2
13	Mod_NR	Module Not Ready; Indicating Module Operational Fault	LVTTTL-0	2
14	RX_LOS	Receiver Loss Of Signal Indicator	LVTTTL-0	2
15	GND	Module Ground		1
16	GND	Module Ground		1
17	RD-	Receiver Inverted Data Output	CML-0	-
18	RD+	Receiver Non-Inverted Data Output	CML-0	-
19	GND	Module Ground		1
20	V <sub>CC2</sub>	+1.8V Power Supply - <b>Not Required</b>		-
21	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.	LVTTTL-I	-
22	V <sub>CC2</sub>	+1.8V Power Supply - <b>Not Required</b>		-
23	GND	Module Ground		1
24	RefCLK+	Reference Clock Non-Inverted Input, AC coupled on the host board - <b>Not Required</b>	PECL-I	3
25	RefCLK-	Reference Clock Inverted Input, AC coupled on the host board - <b>Not Required</b>	PECL-I	3
26	GND	Module Ground		1
27	GND	Module Ground		1
28	TD-	Transmitter Inverted Data Input	CML-1	-
29	TD+	Transmitter Non-Inverted Data Input	CML-1	-
30	GND	Module Ground		1

#### Notes:

1. Module ground pins GND are isolated from the module case.
2. Shall be pulled up with 4.7KΩ to 10KΩ to a voltage between 3.15V and 3.45V on the host board.
3. Reference Clock is not required. If present, it will be ignored.



## Electrical parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter Differential Input Volt	+/-TX_DAT	120		1000	mV p-p	1
Receiver Differential Output Volt	+/-RX_DAT	400		800	mV p-p	2
Tx_Disable, P_Down/RST	Input Voltage – Low	V <sub>IL</sub>	0	0.8	V	
	Input Voltage - High	V <sub>IH</sub>	2.0	V <sub>CC</sub>	V	
RX_LOS, Mod_NR, Interrupt	Output Voltage – Low	V <sub>OL</sub>	0	0.8	V	3
	Output Voltage - High	V <sub>OH</sub>	2.0	V <sub>CC</sub>	V	3
Throughput	B			11.3	Gb/s	
Total current requirement				600	mA	3.3V
				250	mA	5V

## Transmitter parameters

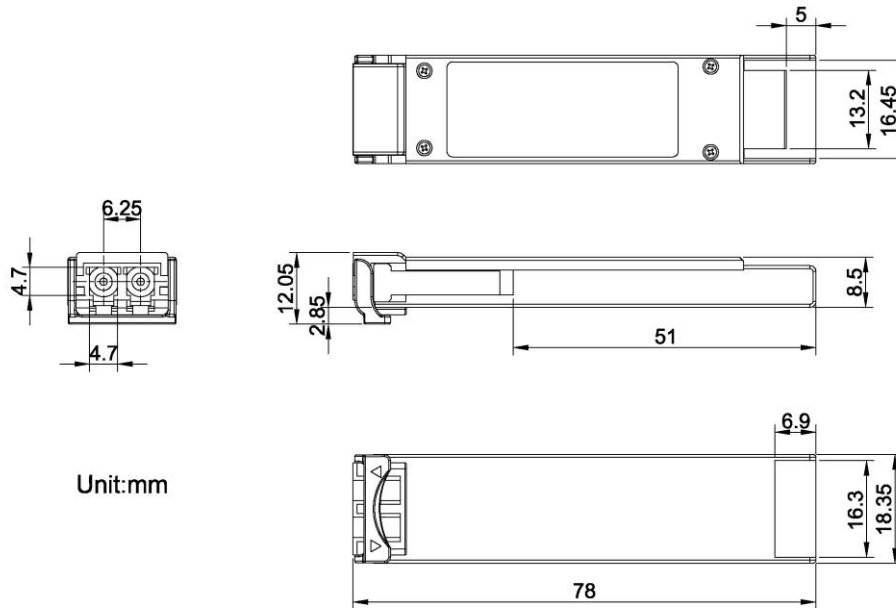
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Central wavelength	$\lambda_c$	$\lambda-0.1$	$\lambda$	$\lambda+0.1$	nm	
Spectral width	$\Delta\lambda$			0.3	nm	
Launch optical power	P <sub>o</sub>	-1		+4	dBm	4
Extinction Ratio	EX	8.2			dB	
Optical Return Loss Tolerance	ORLT	27			dB	
Optical rise/fall time	T <sub>rise</sub> /T <sub>fall</sub>			30	ps	5
Eye diagram	Compliant with IEEE802.3-2005 10G					

## Receiver parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Sensitivity	P <sub>min</sub>			-15	dBm	6
Stressed Sensitivity (OMA)				-13	dBm	
Central wavelength	$\lambda_c$	1480		1580	nm	
Receiver overload	P <sub>MAX</sub>	-1			dBm	6
RX_LOS Asserted	S <sub>A</sub>	-30			dBm	
RX_LOS De-Asserted	S <sub>D</sub>			-16	dBm	
RX_LOS Hysteresis	-		3.0		dB	

- Notes:**
- Internally AC coupled and terminated to 100Ω differential load.
  - Internally AC coupled, but requires a 100Ω differential termination or internal to Serializer/Deserializer.
  - It is open collector/drain output which should be pulled up externally to V<sub>CC</sub> with a 4.7KΩ-10KΩ resistor on the host board. LOS: logic 0 indicates normal operation; logic 1 indicates no signal detected.
  - Optical power is launched into SMF
  - 20-80%
  - Measured with PRBS 2<sup>31</sup>-1 at test pattern @10.3125Gbps.

## Mechanical specification



## Recommended environment conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature Range (industrial)	T	-40	-	85	°C
Operating Temperature Range (standard)	T	0	25	70	°C
Supply Voltage	V <sub>CC</sub>	3.135	3.3	3.465	V
Relative Humidity	RH	5	-	95	%

## Ordering information

FTX-S1XG-DxxL-14BD - DWDM XFP, **with DDMI**, commercial temperature (0~70°C)

FTX-S1XG-DxxL-14BDI - DWDM XFP, **with DDMI, extended temperature (-40~85°C)**

└─ denotes DWDM channel number, 100GHz grid, e.x 47 - 194,70THz (1539.77nm)  
17 - 191,70THz(1563.86nm)

Available channels from 191.7THz do 196.1THz (100GHz grid)

Example part number: FTX-S1XG-D47L-14BD – XFP DWDM, 1539.77nm, 14dB, DDMI, commercial temperature (0~70°C)

For further information regarding host device PCB layout recommendation, power supply requirements, EEPROM memory map, DDMI specification please check:

[SFF-8472 - Description of EEPROM and Digital Diagnostic Monitoring Interface](#) and [INF-8077i - Technical specification for XFP transceiver](#)

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