



FTF-S1XG-DxxL-080D

SFP+ 10GBase-ZR DWDM module, singlemode, 80km, DDMI



PN: FTF-S1XG-DxxL-080D

Description

FTF-S1XG-DxxL-080D Fibrain SFP+ module series offers 10Gb throughput connections over pair of singlemode fibers with maximum link span up to 80km*. These modules are using DWDM EML lasers as transmitters and PIN diodes as receivers. Thanks to adaptation of DWDM technology it is possible to establish up to forty-five 10Gbps throughput data channels between two locations over pair of singlemode fibers (DWDM multiplexers and demultiplexers are required along with suitable number of module pairs - one pair for each channel). Casing made fully from metal alloys ensures very good EMI immunity. Transceivers are fully compliant with SFP+ MSA. These modules are available in two versions with distinct working temperature ranges:

Model	Operating case temperature
FTF-S1XG-DxxL-080D	0~70°C
FTF-S1XG-DxxL-080D I	-40~85°C

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

Applications

- 10GBase-ER/EW 10G Ethernet (10.3125 Gbps)
- 10G Fibre Channel (10.518 Gbps)
- Other high speed optical connections



Key features

- LC Duplex connector
- Transmission distance up to 80km*
- DWDM technology, 45 channels with 100GHz spacing are available (C-Band, 100GHz grid, channels 17~61)
- Temperature-stabilized DWDM EML laser
- Throughput up to 11.3Gb/s
- Hot-Pluggable
- Low power dissipation
- Metal case for low EMI
- Eye safety laser
- **Digital diagnostic interface:** temperature, supply voltage, transmitted power, received power, laser current reports
- Work environment temperature: 0°C to +70°C / -45°C to +85°C
- Compliant with SFP+ MSA SFF-8431 & SFF-8472
- Compliant with IEEE 802.3ae 10GBase-ZR
- Compliant with RoHS directive

Specification:

Standard

IEEE 802.3ae

Supported speeds / Technologies

10G Ethernet, 10G FC

Medium type

Singlemode fiber 9/125μm

Wavelength

1528.77nm ~ 1563.05nm (100GHz spacing)

Transmission distance

up to 80km*

Connector

LC Duplex

Output power

0dBm ~ +4dBm

Receiver sensitivity

-24dBm

Supply voltage

3.3V

Max power consumption

1.5W

Working environment - temperature

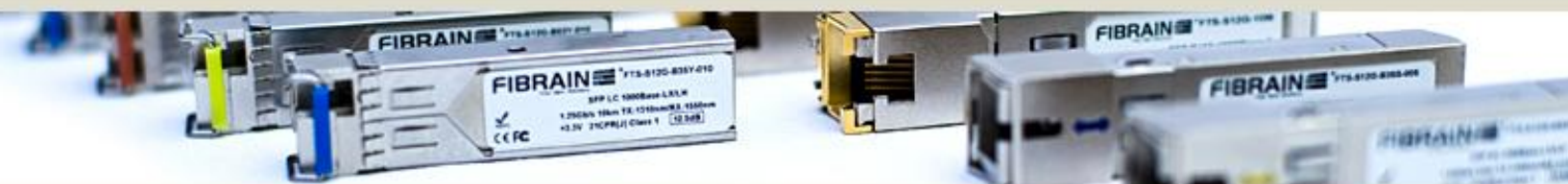
0~70°C / -45~85°C

Working environment - humidity

5~90% non-condensing

Dimensions (length × height × width)

Compliant with SFP+ Multi-Source Agreement



Detailed technical specification

Electrical parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Transmitter Differential Input Volt	+/-TX_DAT	180		700	mV p-p	3
Output line differential impedance	R _{OUT}		100		Ω	
TX_Disable Input Voltage – Low	V _{IL}	0		0.8	V	
TX_Disable Input Voltage – High	V _{IH}	2.0		V _{CC} +0.3	V	
TX_Fault Input Voltage – Low	V _{IL}	0		0.8	V	
TX_Fault Input Voltage – High	V _{IH}	2.0		V _{CC} +0.3	V	
Receiver Differential Output Volt	+/-RX_DAT	300		850	mV p-p	3
Input line differential impedance	R _{IN}		100		Ω	
RX_LOS Output Voltage- Low	V _{OL}	0		0.8	V	4
RX_LOS Output Voltage- High	V _{OH}	2.0		V _{CC} +0.3	V	4
TX turn on time				10	μs	

Transmitter parameters

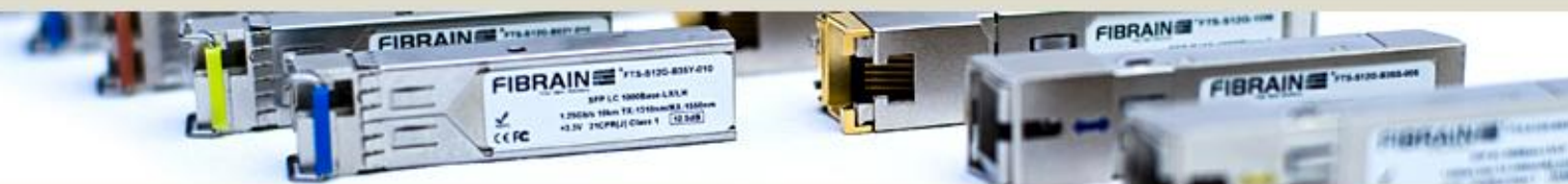
Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Throughput	B	9.95	10.3125	11.3	Gb/s	
Central wavelength	λ _c	λ-0.1	λ	λ+0.1	nm	
Spectral width (-20dB)	Δλ	-	-	0.6	nm	
Output optical power	P _{max}	0	-	4	dBm	1
Extinction ratio	EXT	9		-	dB	
Transmitter Dispersion Penalty	TDP			3.2	dB	
Side mode suppression ratio	SMSR	30			dB	
Eye diagram		Compliant with IEEE802.3ae				

Receiver parameters

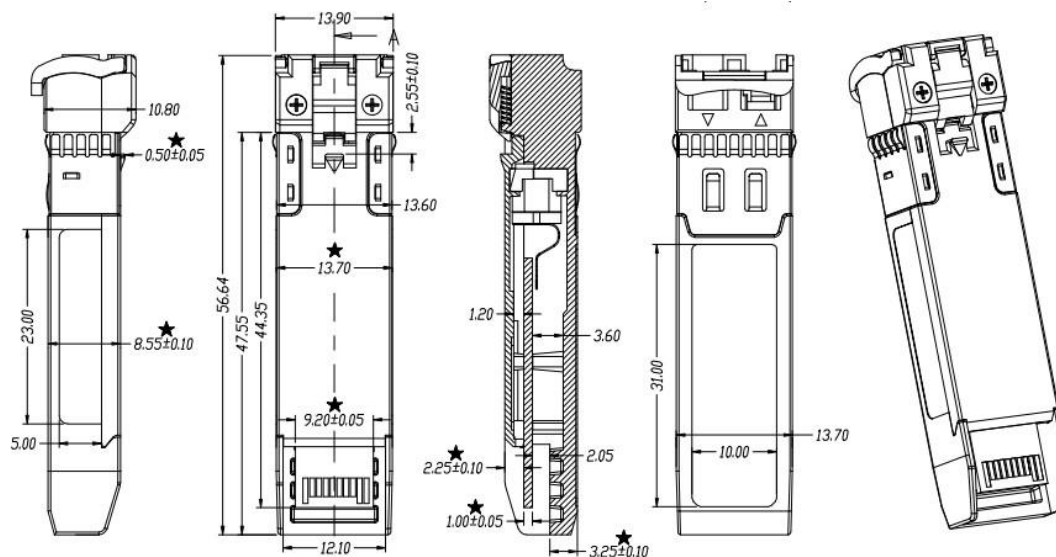
Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Sensitivity	P _{min}	-	-	-24	dBm	2
Receiver Overload	P _{MAX}	-7	-	-	dBm	
RX_LOS Assertion	S _A	-35	-	-	dBm	
RX_LOS Deassertion	S _D	-	-	-27	dBm	
LOS hysteresis	LOS _H	0.5			dB	
Optical return loss	ORL	-		-27	dB	
Central wavelength	λ _c		λ		nm	
Signal rise/fall time	T _R , T _F	28			ps	

Remarks:

1. 9/125μm SM fiber
2. Measured with a PRBS 2³¹-1 test pattern @10.3125Gb/s
3. Internally AC coupled, but requires a external 100Ω differential load termination.
4. LOS is an open collector output. Should be pulled up with 4.7KΩ on the host board.



Transceiver dimensions



Recommended environment conditions

Work

Temperature

0~70°C / -40~85°C (extended temperature range)

Humidity

5~90% non-condensing

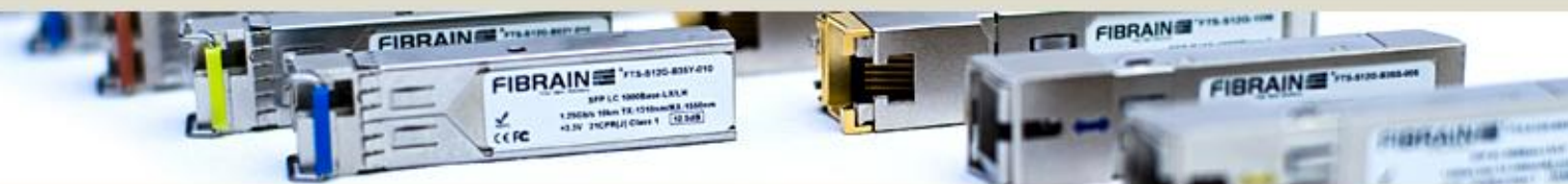
Storage

Temperature

-40~85°C

Humidity

5~95% non-condensing



Ordering information

FTF-S1XG-DxxL-040D / FTF-S1XG-DxxL-040DI are a generic part numbers for whole family of SFP+ DWDM modules for 40km* reach. Module with particular TX wavelength will have part number as follows:

FTF-S1XG-C**18**L-080D - SFP+ module with TX central wavelength of 1563.05nm (**191.8**THz)
 FTF-S1XG-D**19**L-080D - SFP+ module with TX central wavelength of 1562.23nm (**191.9**THz)
 FTF-S1XG-D**20**L-080D - SFP+ module with TX central wavelength of 1561.42nm (**192.0**THz)
 FTF-S1XG-D**21**L-080D - SFP+ module with TX central wavelength of 1560.61nm (**192.1**THz)
 FTF-S1XG-D**22**L-080D - SFP+ module with TX central wavelength of 1559.79nm (**192.2**THz)
 FTF-S1XG-D**23**L-080D - SFP+ module with TX central wavelength of 1558.98nm (**192.3**THz)
 FTF-S1XG-D**24**L-080D - SFP+ module with TX central wavelength of 1558.17nm (**192.4**THz)
 FTF-S1XG-D**25**L-080D - SFP+ module with TX central wavelength of 1557.36nm (**192.5**THz)
 FTF-S1XG-D**26**L-080D - SFP+ module with TX central wavelength of 1556.55nm (**192.6**THz)
 FTF-S1XG-D**27**L-080D - SFP+ module with TX central wavelength of 1555.75nm (**192.7**THz)
 FTF-S1XG-D**28**L-080D - SFP+ module with TX central wavelength of 1554.94nm (**192.8**THz)
 FTF-S1XG-D**29**L-080D - SFP+ module with TX central wavelength of 1554.13nm (**192.9**THz)
 FTF-S1XG-D**30**L-080D - SFP+ module with TX central wavelength of 1553.33nm (**193.0**THz)
 FTF-S1XG-D**31**L-080D - SFP+ module with TX central wavelength of 1552.52nm (**193.1**THz)
 FTF-S1XG-D**32**L-080D - SFP+ module with TX central wavelength of 1551.72nm (**193.2**THz)
 FTF-S1XG-D**33**L-080D - SFP+ module with TX central wavelength of 1550.92nm (**193.3**THz)
 FTF-S1XG-D**34**L-080D - SFP+ module with TX central wavelength of 1550.12nm (**193.4**THz)
 FTF-S1XG-D**35**L-080D - SFP+ module with TX central wavelength of 1549.32nm (**193.5**THz)
 FTF-S1XG-D**36**L-080D - SFP+ module with TX central wavelength of 1548.51nm (**193.6**THz)
 FTF-S1XG-D**37**L-080D - SFP+ module with TX central wavelength of 1547.72nm (**193.7**THz)
 FTF-S1XG-D**38**L-080D - SFP+ module with TX central wavelength of 1546.92nm (**193.8**THz)
 FTF-S1XG-D**39**L-080D - SFP+ module with TX central wavelength of 1546.12nm (**193.9**THz)
 FTF-S1XG-D**40**L-080D - SFP+ module with TX central wavelength of 1545.32nm (**194.0**THz)
 FTF-S1XG-D**41**L-080D - SFP+ module with TX central wavelength of 1544.53nm (**194.1**THz)
 FTF-S1XG-D**42**L-080D - SFP+ module with TX central wavelength of 1543.73nm (**194.2**THz)
 FTF-S1XG-D**43**L-080D - SFP+ module with TX central wavelength of 1542.94nm (**194.3**THz)
 FTF-S1XG-D**44**L-080D - SFP+ module with TX central wavelength of 1542.14nm (**194.4**THz)
 FTF-S1XG-D**45**L-080D - SFP+ module with TX central wavelength of 1541.35nm (**194.5**THz)
 FTF-S1XG-D**46**L-080D - SFP+ module with TX central wavelength of 1540.56nm (**194.6**THz)
 FTF-S1XG-D**47**L-080D - SFP+ module with TX central wavelength of 1539.77nm (**194.7**THz)
 FTF-S1XG-D**48**L-080D - SFP+ module with TX central wavelength of 1538.98nm (**194.8**THz)
 FTF-S1XG-D**49**L-080D - SFP+ module with TX central wavelength of 1538.19nm (**194.9**THz)
 FTF-S1XG-D**50**L-080D - SFP+ module with TX central wavelength of 1537.40nm (**195.0**THz)
 FTF-S1XG-D**51**L-080D - SFP+ module with TX central wavelength of 1536.61nm (**195.1**THz)
 FTF-S1XG-D**52**L-080D - SFP+ module with TX central wavelength of 1535.82nm (**195.2**THz)



FTF-S1XG-D**53**L-080D - SFP+ module with TX central wavelength of 1535.04nm (19**5.3**THz)
 FTF-S1XG-D**54**L-080D - SFP+ module with TX central wavelength of 1534.25nm (19**5.4**THz)
 FTF-S1XG-D**55**L-080D - SFP+ module with TX central wavelength of 1533.47nm (19**5.5**THz)
 FTF-S1XG-D**56**L-080D - SFP+ module with TX central wavelength of 1532.68nm (19**5.6**THz)
 FTF-S1XG-D**57**L-080D - SFP+ module with TX central wavelength of 1531.90nm (19**5.7**THz)
 FTF-S1XG-D**58**L-080D - SFP+ module with TX central wavelength of 1531.12nm (19**5.8**THz)
 FTF-S1XG-D**59**L-080D - SFP+ module with TX central wavelength of 1530.33nm (19**5.9**THz)
 FTF-S1XG-D**60**L-080D - SFP+ module with TX central wavelength of 1529.55nm (19**5.0**THz)
 FTF-S1XG-D**61**L-080D - SFP+ module with TX central wavelength of 1528.77nm (19**6.1**THz)

Versions with extended working temperature ranges (-40 ~ +85°C) are available on demand. For lead time information please contact sales department. Modules with extended temperature ranges are marked with "I" letter at the end of part number.

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-8431 - Technical specification for SFP+ transceiver](#)

Technical specification is subject to change without end user notification. Pictures used for reference only, actual product look may differ. For most actual information please contact technical support via aktywa@elmat.pl

* - transmission distance depends on optical link attenuation, fiber type and other conditions