

FTF-S1XG-DTCL-080DI

SFP+10Gbps, DWDM Tunable 48 channels, 100GHz, SM, 80km, I-Temp



Description

FTF-S1XG-DTCL-080DI series SFP+ transceiver can be used to establish multiple high-speed serial data links over single-mode fiber. It is a high-performance, cost-effective module that supports multi-rate transmission from 9.95 Gbps to 11.3 Gbps with CDR, 8.5 Gbps bypassing CDR, and a transmission distance of up to 80 km. The transmitter section incorporates a laser driver and a TTOSA, whereas the receiver section consists of an APD photodiode integrated with a transimpedance preamplifier (TIA). The module is hot-pluggable into the 20-pin connector. Transceivers are fully compliant with SFP+ MSA specifications.

Host device can access module internal EEPROM memory and DDMI via I²C 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, Juniper, Extreme Networks, Alcatel-Lucent, 3Com, Linksys, Huawei and more.

Applications

- DWDM 10Gb/s Ethernet & 10Gb/s Fibre Channel
- DWDM 10Gb/s SONET/SDH
- DWDM 10Gb/s SONET/SDH w/FEC
- DWDM 10Gb/s Ethernet & 10Gb/s Fibre Channel w/FEC



Key features

- LC Duplex receptacle
- Transmission distance up to 80km*
- Support Multi Rate 9.95Gbps to 11.3Gbps with CDR, 8.5Gbps bypass CDR
- SFP+ MSA package with duplex LC connector
- Monolithic MZM Tunable TOSA
- APD receiver
- 100GHz ITU-based channel spacing (C-Band)
- Total 48 channels
- Hot-Pluggable
- RoHS compliant
- Class 1 laser safety
- Power consumption less than 2.8W
- Metal case for low EMI
- Operating case temperature: -40~85°C

Specification

Transmission medium

Single-mode fiber 9/125μm

Transmission distance**

80km

Receptacle type

LC Duplex

Wavelength

DWDM 100 GHz grid, C-Band Tunable

Output power

-1~+3dBm

Receiver sensitivity

-23dBm

Power supply voltage

3.3V

Total power consumption

< 2.8W

Operating environment – temperature

-40~+85°C

Operating environment - humidity

5~95% non-condensing

Dimensions

Compliant with SFP+ Multi-Source Agreement

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



Detailed technical specification

Pin Description

Pin	Name	Function/Description	Notes
1	VeeT	Transmitter Ground	1
2	TX Fault	Transmitter Fault Indication	2
3	TX Disable	Transmitter Disable-Module disables on high or open	3
4	SDA	Module Definition 2-Two wire serial ID interface	4
5	SCL	Module Definition 1-Two wire serial ID interface	4
6	MOD_ABS	Module Absent, connected to VeeT or VeeR in the module	5
7	RS0	Rate Select 0	
8	RX_LOS	Receiver Loss of Signal Indication (In FC designated as RX_LOS, in SONET designated as LOS, and in Ethernet designated as Signal Detect)	2
9	RS1	Rate Select 1	
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data output	
13	RD+	Received Non-Inverted Data output	
14	VeeR	Receiver Ground	1
15	VccR	Receiver Power - +3.3V±5%	
16	VccT	Transmitter Power - +3.3 V±5%	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted Data Input	
19	TD-	Transmitter Inverted Data Input	
20	VeeT	Transmitter Ground	1

Notes:

- [1] The module signal ground pins, VeeR and VeeT, shall be isolated from the module case.
- [2] This pin is an open collector/drain output pin and shall be pulled up with 4.7k-10kohms to Host_Vcc on the host board. Pull ups can be connected to multiple power supplies, however the host board design shall ensure that no module pin has voltage exceeding module VccT/R + 0.5 V.
- [3] This pin is an open collector/drain input pin and shall be pulled up with 4.7k-10kohms to VccT in the module.
- [4] See SFF-8431 4.2 2-wire Electrical Specifications.
- [5] This pin shall be pulled up with 4.7k-10kohms to Host_Vcc on the host board.



Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	T _c	-40	25	85	°C	
Supply Voltage	V _{cc}	3.14	3.3	3.47	V	
Power Consumption	P	-	-	2.8	W	
Data Rate		8.5	10.3125	11.3	Gbps	
Transmission Distance		-	-	80	km	

Transmitter parameters

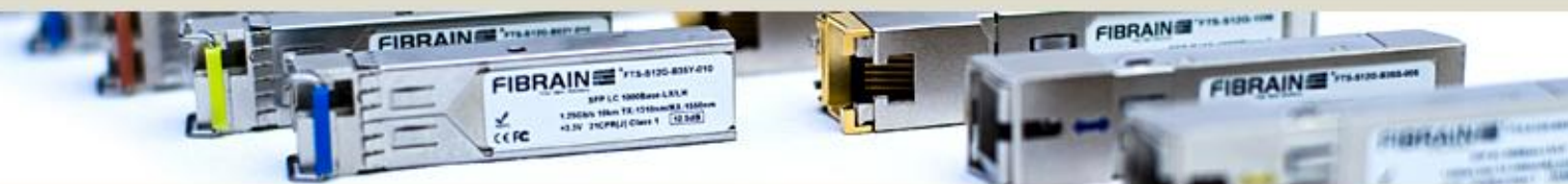
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Central wavelength range	λ _c	1529.55	λ	1567.13	nm	
Center Frequency	CW	191.3		196.0	THz	
Spectral width	Δλ			0.3	nm	
Average optical power	P _o	-1		+3	dBm	
Extinction Ratio	EX	8.2			dB	
Dispersion penalty				2	dB	
Optical Return Loss Tolerance	ORLT			-27	dB	
Relative Intensity Noise	T _{rise} /T _{fall}			-128	ps	
Eye diagram	Compliant with IEEE802.3-2005 10G					

Receiver parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Sensitivity @(BER=1E-12, PRBS 2 ³¹ -1, NRZ, 9.95Gbps~10.7Gbps data rate)	P _{sen}			-23	dBm	
Sensitivity @(BER=1.0E-04, PRBS 2 ³¹ -1, NRZ, 11.3Gbps data rate)	P _{sen}			-26	dBm	
B2B OSNR Tolerance @ 1E-4				16	dB	
OSNR Tolerance with 1400ps/nm @ 1E-4				18	dB	
Central wavelength	λ _c	1529.55		1567.13	nm	
Receiver overload	P _{MAX}	-7			dBm	
RX_LOS Asserted	S _A	-35			dBm	
RX_LOS De-Asserted	S _D			-28	dBm	
RX_LOS Hysteresis	-	0.5			dB	

Wavelength channel number

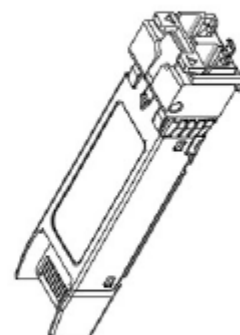
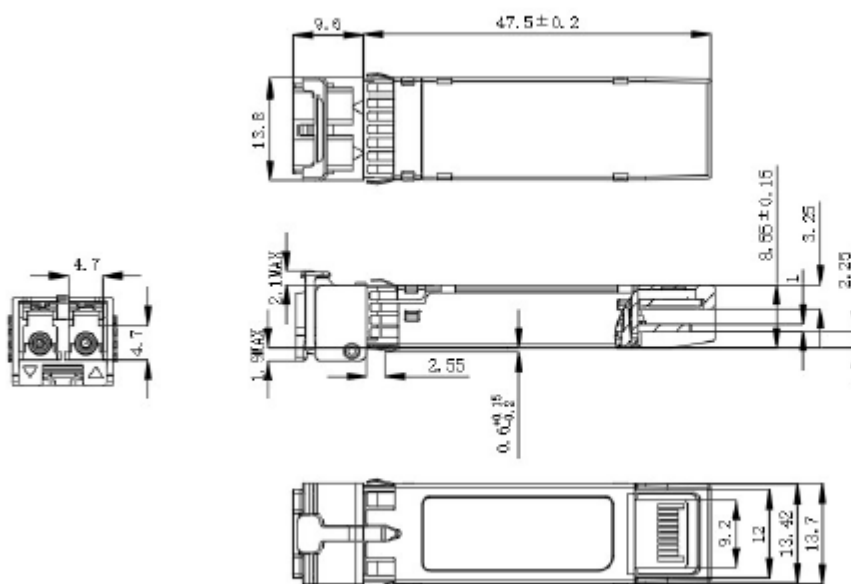
Channel	Frequency (THz)	Wavelength (nm)	Channel	Frequency (THz)	Wavelength (nm)
CH1	191.30	1567.133	CH25	193.70	1547.715
CH2	191.40	1566.314	CH26	193.80	1546.917
CH3	191.50	1565.496	CH27	193.90	1546.119
CH4	191.60	1564.679	CH28	194.00	1545.322
CH5	191.70	1563.863	CH29	194.10	1544.526
CH6	191.80	1563.047	CH30	194.20	1543.730
CH7	191.90	1562.233	CH31	194.30	1542.936
CH8	192.00	1561.419	CH32	194.40	1542.142
CH9	192.10	1560.606	CH33	194.50	1541.349



CH10	192.20	1559.794	CH34	194.60	1540.557
CH11	192.30	1558.983	CH35	194.70	1539.766
CH12	192.40	1558.173	CH36	194.80	1538.976
CH13	192.50	1557.363	CH37	194.90	1538.186
CH14	192.60	1556.555	CH38	195.00	1537.397
CH15	192.70	1555.747	CH39	195.10	1536.609
CH16	192.80	1554.940	CH40	195.20	1535.822
CH17	192.90	1554.134	CH41	195.30	1535.036
CH18	193.00	1553.329	CH42	195.40	1534.250
CH19	193.10	1552.524	CH43	195.50	1533.465
CH20	193.20	1551.721	CH44	195.60	1532.681
CH21	193.30	1550.918	CH45	195.70	1531.898
CH22	193.40	1550.116	CH46	195.80	1531.116
CH23	193.50	1549.315	CH47	195.90	1530.334
CH24	193.60	1548.515	CH48	196.00	1529.553

Mechanical specification

Unit: mm



Tolerance: $X.X \pm 0.10\text{mm}$



Recommended environment conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature Range (industrial)	T	-40	-	85	°C
Supply Voltage	V _{CC}	3.135	3.3	3.465	V
Relative Humidity	RH	5	-	95	%

Ordering information

FTF-S1XG-DTCL-080DI – FIBRAIN TSFP+ ZR 10G Tunable DWDM 100GHz ITU-based channel spacing (C-Band) 48 channels 80km DDMI I-Temp

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-8074 - Technical specification for SFP transceiver](#)

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