



FTF-C1XG-Tx

SFP+ 10GBase Direct Attached Cable, 0.5-10m



Description

Fibrain FTF-C1XG-Tx is Direct Attached Cable. It offers 10Gb throughput over copper cable ended with SFP+ plugs. This cable is widely used to establish cheap cabinet-to-cabinet or device-to-device connections with 10Gbp speed. Full metal casing ensures very good EMI immunity. Transceiver mounted at the ends of this cable are fully compliant with SFP+ MSA. It is available in two versions.

Model	Operating case temperature
FTF-C1XG-Tx	0~70°C
FTF-C1XG-Tx I	-40~85°C

x – indicates cable length(0.5m, 1m, 3m, 5m, 7m, 10m), more info available in Ordering Information chapter

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

- 10G Ethernet (10.3125 Gbps) short cross connections
- 10G Fibre Channel (10.518 Gbps) short cross connections
- Other high speed copper cable connections (up to 11.3Gbps)



Key features

- SFP+ pluggable transceivers connected via copper cable
- Transmission distance (for details check ordering informations)
- Throughput from 9.95 up to 11.3Gb/s
- Hot-Pluggable
- Low power dissipation
- Metal case for low EMI
- Work environment temperature: 0°C to +70°C / -40°C to +85°C
- Compliant with SFP+ MSA SFF-8431 & SFF-8472
- Compliant with IEEE 802.3ae 10GBase-CX
- Compliant with RoHS directive

Specification

Supported transmission technology

10G Ethernet, 10G FC

Speed supported for Ethernet technology

10.25Gbps, 1.25Gbps

Speed supported for Fibre Channel technology

10.51875Gbps

Transmission medium

Copper cable

Transmission distance

0.5m, 1m, 3m, 5m, 7m, 10m

Receptacle type

SFP+

Wavelength

N/A

Output power

N/A

Receiver sensitivity

N/A

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 SFP+ Multi-Source Agreement

* - standard industrial



Detailed technical specification

Pin Description

Pin	Name	Function/Description	Engagement order	Notes
1	VeeT	Transmitter Ground	1	-
2	TX Fault	Transmitter Fault Indication	3	
3	TX Disable	Transmitter Disable-Module disables on high or open	3	1
4	MOD-DEF2	Module Definition 2-Two wire serial ID interface	3	2
5	MOD-DEF1	Module Definition 1-Two wire serial ID interface	3	2
6	MOD-DEF0	Module Definition 0-Grounded in module	3	2
7	Rate Select	Not Connected	3	-
8	LOS	Loss of Signal	3	3
9	VeeR	Receiver Ground	1	-
10	VeeR	Receiver Ground	1	-
11	VeeR	Receiver Ground	1	-
12	RD-	Inverse Received Data out	3	4
13	RD+	Received Data out	3	4
14	VeeR	Receiver Ground	1	-
15	VccR	Receiver Power - +3.3V±5%	2	5
16	VccT	Transmitter Power - +3.3 V±5%	2	5
17	VeeT	Transmitter Ground	1	-
18	TD+	Transmitter Data In	3	6
19	TD-	Inverse Transmitter Data In	3	6
20	VeeT	Transmitter Ground	1	-

Notes:

- TX Disable input is used to shut down the PHY. It is pulled up within the module with a 4.7 – 10K resistor.
 - Low (0 – 0.8V): PHY Enabled
 - Between (0.8V and 2V): Undefined
 - High (2.0 – VccT): PHY Disabled
 - Open : PHY Disabled
- Mod-Def 0, 1, 2. These are the module definition pins. They should be pulled up with a 4.7KΩ-10KΩ resistor on the host board to supply less than VccT+0.3V or VccR+0.3V.
 - Mod-Def 0 is grounded by the module to indicate that the module is present.
 - Mod-Def 1 is clock line of two wire serial interface for optional serial ID.
 - Mod-Def 2 is data line of two wire serial interface for optional serial ID.
- LOS (Loss of Signal) is not available and tied to ground in FTS-C12G-10M and FTS-C12G-10MI
- RD-/+ : These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω differential at the user SERDES. The AC coupling is done inside the module and thus not required on the host board.
- VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V±5% at the SFP connector pin. The in-rush current will typically be no more than 30mA above steady state supply current after 500ns.
- TD-/+ : These are the differential transmitter inputs. They are AC coupled differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on host board.



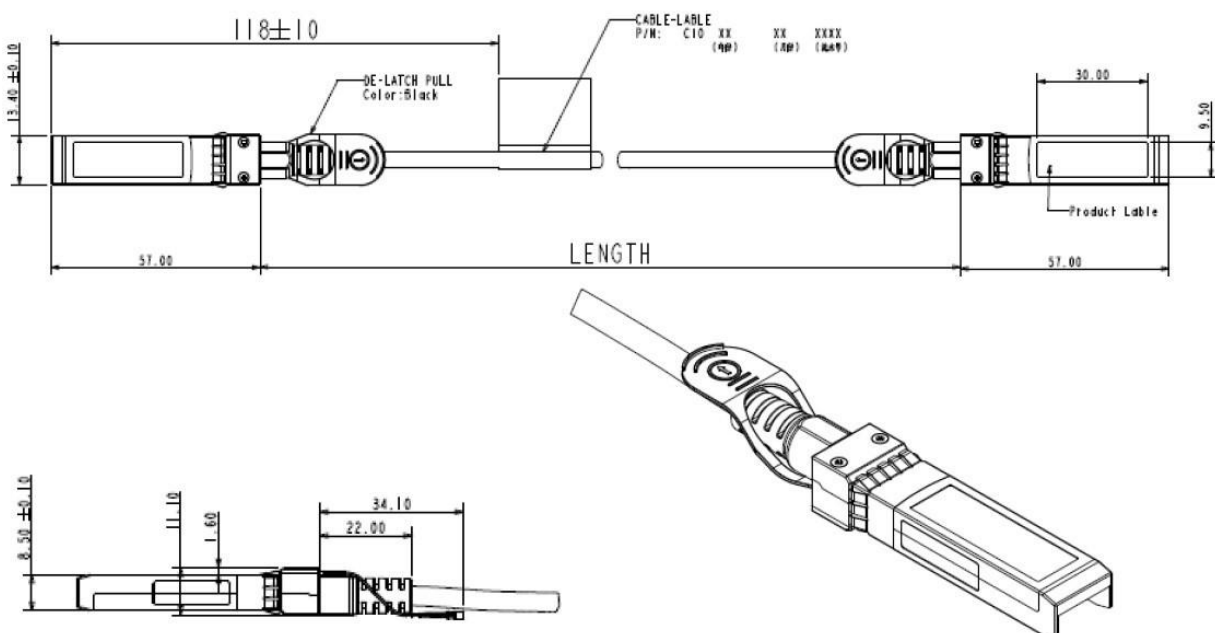
Electrical parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter Differential Input Volt	+/-TX_DAT	180		700	mV p-p	
Output line differential impedance	R _{OUT}		100		Ω	2
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	
Input line differential impedance	R _{IN}		100		Ω	3
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
Data rate		9.95	10.3	11.3	Gbps	1
VMA Loss	L			4.4	dBe	
VMA to crosstalk ratio		32			dB	
Differential waveform distortion penalty				6.7	dBe	
Cable gauge			30 24		AWG	0.5m, 1m, 3m 5m

Notes:

1. Measured with a PRBS 231-1 test pattern @10.3125Gbps
2. Internally AC coupled and terminated to 100Ω differential load. No termination at SerDes is required.
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.

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 _{CC}	3.135	3.3	3.465	V
Relative Humidity	RH	5	-	95	%

Ordering information

- FTF-C1XG-Tx – SFP+, 10GBase Passive Direct Attached Cable, 0.5-5m, commercial temperature (0~70°C)
- FTF-C1XG-Tx – SFP+, 10GBase Active Direct Attached Cable, 7m-10m, commercial temperature (0~70°C)
- FTF-C1XG-TxI – SFP+, 10GBase Passive Direct Attached Cable, 0.5-5m, industrial temperature (-40~85°C)
- FTF-C1XG-TxI – SFP+, 10GBase Active Direct Attached Cable, 7m-10m, industrial temperature (-40~85°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 [SFF-8431 - Technical specification for SFP+ transceiver](#)

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