



FT2-S1XG-DxxQ-22BD

X2 10Gbps, DWDM, single-mode, 22dB



Description

FT2-S1XG-DxxQ-22BD series X2 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 22dB optical power budget is guaranteed. Transceivers are fully compliant with X2 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
FT2-S1XG-DxxQ-22BD	0~70°C
FT2-S1XG-DxxQ-22BDI	-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 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, HP, Juniper, Extreme Networks, Alcatel-Lucent, 3Com, Linksys and more.



Applications

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

Key features

- SC Duplex receptacle
- Transmission distance up to 80km*
- EML DWDM laser diode, APD receiver (100 GHz grid, C-Band)
- Throughput up to 11.3Gb/s
- Fully compliant with X2 MSA INF-8476i
- 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

Speed supported for Ethernet technology

10.25Gbps

Speed supported for Fibre Channel technology

N/A

Transmission medium

Single-mode fiber 9/125µm

Transmission distance**

80km

Receptacle type

SC Duplex

Wavelength

DWDM 100 GHz grid, C-Band

Output power

0~+4dBm

Receiver sensitivity

-24dBm

Power supply voltage

3.3V

Total power consumption

< 1W

Operating environment – temperature*

0~70°C / -40~+85°C

Operating environment - humidity

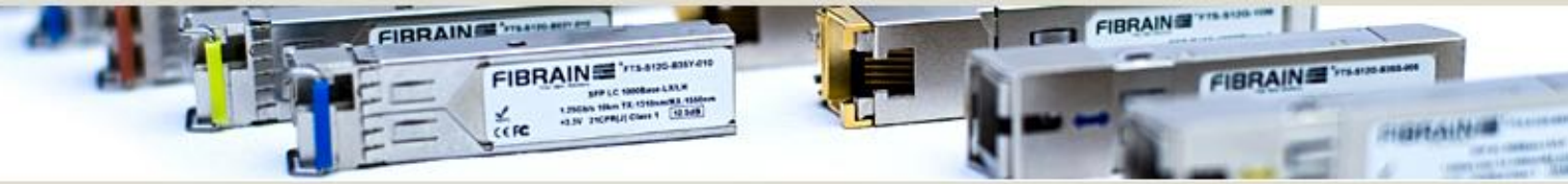
5~95% non-condensing

Dimensions

Compliant with X2 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
1	GND	Electrical Ground	-
2	GND	Electrical Ground	-
3	GND	Electrical Ground	-
4	5.0V	Reserved - Not Required	-
5	3.3V	Power Supply	I
6	3.3V	Power Supply	I
7	APS	Adaptive power supply	I
8	APS	Adaptive power supply	I
9	LASI	Link Alarm Status Interrupt. 10-22KΩ resistor pull-up to 1.2V on host	Open Drain-O
10	RESET	Low active Reset input ,10KΩ pull-up inside Transponder	Open Drain-I
11	VEND SPECIFIC	Vendor Specific Pin, leave unconnected	-
12	TX ON/OFF	High active Transmitter Enable, 10kΩ pull-up inside Transponder	Open Drain-I
13	RESERVED	Reserved	-
14	MOD DETECT	1KΩ to Ground inside Transponder	O
15	VEND SPECIFIC	Vendor Specific Pin, leave unconnected	-
16	VEND SPECIFIC	Vendor Specific Pin, leave unconnected	-
17	MDIO	Management Data I/O. Requires external 10-22KΩ pull-up to 1.2V on host	Open Drain-I/O
18	MDC	Management Clock Input	1.2V COMS-I
19	PRTAD4	Port Address bit 4(low=0)	1.2V COMS-I
20	PRTAD3	Port Address bit 3(low=0)	1.2V COMS-I
21	PRTAD2	Port Address bit 2(low=0)	1.2V COMS-I
22	PRTAD1	Port Address bit 1(low=0)	1.2V COMS-I
23	PRTAD0	Port Address bit 0(low=0)	1.2V COMS-I
24	VEND SPECIFIC	Vendor Specific Pin, leave unconnected	-
25	APS SET	Feedback input for APS, Input of APS setting resistor	I
26	RESERVED	Reserved	-
27	APS SENSE	APS Sense output for APS control circuit	O
28	APS	Adaptive power supply	I
29	APS	Adaptive power supply	I
30	3.3V	Power Supply	I
31	3.3V	Power Supply	I
32	5.0V	Reserved - Not Required	-
33	GND	Electrical Ground	-
34	GND	Electrical Ground	-
35	GND	Electrical Ground	-



36	GND	Electrical Ground	-
37	GND	Electrical Ground	-
38	RESERVED	Reserved	-
39	RESERVED	Reserved	-
40	GND	Electrical Ground	-
41	RX LANE 0+	Module XAUI output lane 0+	0
42	RX LANE 0-	Module XAUI output lane 0-	0
43	GND	Electrical Ground	
44	RX LANE 1+	Module XAUI output lane 1+	0
45	RX LANE 1-	Module XAUI output lane 1-	0
46	GND	Electrical Ground	
47	RX LANE 2+	Module XAUI output lane 2+	0
48	RX LANE 2-	Module XAUI output lane 2-	0
49	GND	Electrical Ground	
50	RX LANE 3+	Module XAUI output lane 3+	0
51	RX LANE 3-	Module XAUI output lane 3-	0
52	GND	Electrical Ground	
53	GND	Electrical Ground	
54	GND	Electrical Ground	
55	TX LANE 0+	Module XAUI Input lane 0+	1
56	TX LANE 0-	Module XAUI Input lane 0-	1
57	GND	Electrical Ground	
58	TX LANE 1+	Module XAUI Input lane 1+	1
59	TX LANE 1-	Module XAUI Input lane 1-	1
60	GND	Electrical Ground	
61	TX LANE 2+	Module XAUI Input lane 2+	1
62	TX LANE 2-	Module XAUI Input lane 2-	1
63	GND	Electrical Ground	
64	TX LANE 3+	Module XAUI Input lane 3+	1
65	TX LANE 3-	Module XAUI Input lane 3-	1
66	GND	Electrical Ground	
67	RESERVED	Reserved	
68	RESERVED	Reserved	
69	GND	Electrical Ground	
70	GND	Electrical Ground	



Electrical parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter Differential Input Volt	+/-TX_DAT	200		1600	mV p-p	1
Receiver Differential Output Volt	+/-RX_DAT	800		1600	mV p-p	1
XAUI Baud Rate Tolerance		-100		+100	ppm	
Total Jitter	T _{JXAUI}			0.35	UI	
Deterministic Jitter	D _{JXAUI}			0.37	UI	
1.2V CMOS I/O	Input Voltage – Low	V _{IL}		0.36	V	
	Input Voltage - High	V _{IH}	0.84	1.5	V	
	Output Voltage – Low	V _{OL}		0.15	V	
	Output Voltage - High	V _{OH}	1		V	
MDIO I/O	Input Voltage – Low	V _{ILM}	-0.3	0.36	V	
	Input Voltage - High	V _{IHM}	0.84	1.5	V	
	Output Voltage – Low	V _{OLM}	-0.3	0.2	V	
	Output Voltage - High	V _{OHM}	1	1.5	V	
	MDIO Data Hold Time	t _{HOLD}	10			ns
	MDIO Data Setup Time	t _{SU}	10			ns
	Delay from MDC Rising Edge to MDIO Data Change	t _{DELAY}			300	ns
	MDC Clock Rate	f _{MAX}			2.5	MHz
Throughput	B			11.3	Gb/s	

Transmitter parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Central wavelength	λ_c	$\lambda-0.1$	λ	$\lambda+0.1$	nm	
Spectral width	$\Delta\lambda$			0.3	nm	
Launch optical power	P _o	0		+4	dBm	
Extinction Ratio	EX	8.2			dB	
Optical Return Loss Tolerance	ORLT	27			dB	
Optical rise/fall time	T _{rise} /T _{fall}			30	ps	
Eye diagram	Compliant with IEEE802.3-2005 10G					

Receiver parameters

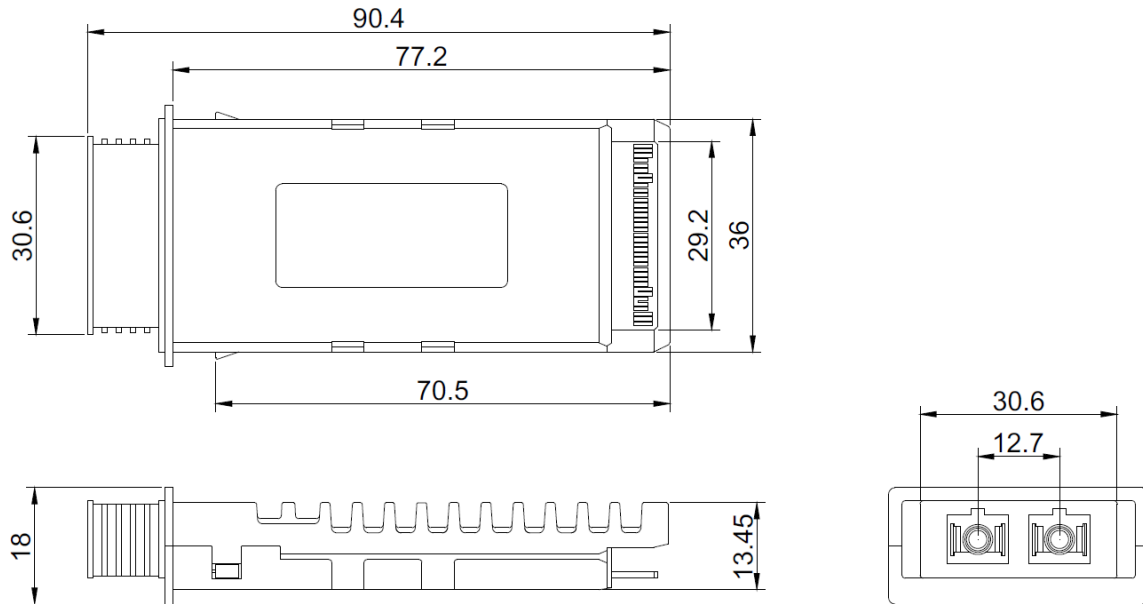
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Sensitivity	P _{min}			-24	dBm	
Stressed Sensitivity (OMA)				-22	dBm	
Central wavelength	λ_c	1480		1580	nm	
Receiver overload	P _{MAX}	-7			dBm	
RX_LOS Asserted	S _A	-33			dBm	
RX_LOS De-Asserted	S _D			-25	dBm	
RX_LOS Hysteresis	-		3.0		dB	

Notes:

1. Internally AC coupled.



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
Supply Voltage	V _{aps}	1.152	1.2	1.248	V
Relative Humidity	RH	5	-	95	%

Ordering information

FT2-S1XG-DxxQ-22BD - DWDM X2, **with DDMI**, commercial temperature (0~70°C)

FT2-S1XG-DxxQ-22BDI - DWDM X2, **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: FT2-S1XG-D47Q-22BD – X2 DWDM, 1539.77nm, 22dB, 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:

[INF-8476i - Technical specification for X2 transceiver](#)

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