1.25Gbps GBIC Transceiver

(For 80km transmission, RoHS compliant)

Members Of Flexon™ Family

Features

- 1.25Gbps bit-rate
- 1550nm DFB laser and PIN photodiode for 80km transmission
- Class I laser product
- Low EMI and excellent ESD protection
- Duplex SC optical interface
- Extended power supply +3.3/5.0V compatibility
- Standard serial ID information compatible with SFF-8053
- Operating case temperature: 0 to +70°C

Applications

- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Standard

- Compatible with GBIC specification (SFF-8053), Rev 5.5
- Compatible with IEEE 802.3z
- Compatible with IEEE 802.3ah
- Compatible with FCC 47 CFR Part 15, Class B
- Compatible with FDA 21 CFR 1040.10 and 1040.11, Class I
- RoHS Compliant

Description

Fiberxon 1.25Gbps GBIC transceivers are high performance, cost effective modules. It is designed for Gigabit Ethernet application of 80km transmission distance.

The transceiver consists of two sections: The transmitter section incorporates a highly reliable uncooled DFB laser. And the receiver section consists of a PIN photodiode mounted together with a trans-impedance preamplifier (TIA). All modules satisfy Class I Laser Safety requirements.

The standard serial ID information compatible with GBIC MSA describes the transceiver's capabilities, standard interfaces, manufacturer and other information. The host equipment can access this information via the 2-wire serial CMOS EEPROM protocol. For further information, please refer to SFF-8053.

FTM-5012S-G80G is RoHS compliant.

Regulatory Compliance

The transceivers have been tested according to American and European product safety and electromagnetic compatibility regulations (See Table 1). For further information regarding regulatory certification, please refer to Flexon™ regulatory specification and safety guidelines, or contact with Fiberxon, Inc. America sales office listed at the end of the documentation.

Table 1 - Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1(>500 V)
Electrostatic Discharge (ESD) to the Duplex LC Receptacle	IEC 61000-4-2 GR-1089-CORE	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B	Compatible with standards
Immunity	IEC 61000-4-3	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2	Compatible with Class I laser product.
Component Recognition	UL and CSA	Compatible with standards
RoHS	2002/95/EC 4.1&4.2	Compliant with standards

Absolute Maximum Ratings

Absolute Maximum Ratings are those values beyond which damage to the devices may occur.

Table 2 – Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T_S	-40	+85	°C
Supply Voltage	V_{CC}	-0.5	6	V
Operating Humidity	-	5	95	%

Recommended Operating Conditions

Table 3 - Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	T_C	0		+70	°C
Power Supply Voltage	V_{CC}	3.1		5.5	V
Power Supply Current	I_{CC}			300	mA
Data Rate			1.25		Gbps

Optical and Electrical Characteristics

Table 4 –Optical and Electrical Characteristics

Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter							
Centre Wavelength		λ_C	1530	1550	1580	nm	
Average Output Power		P_{0ut}	0		4.7	dBm	1
Spectral Width (-20dB)		$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio		SMSR	30			dB	
Extinction Ration		EX	9			dB	
P_{0ut}@TX Disable Asserted					-45	dBm	1
Rise/Fall Time (20%～80%)		t_r/t_f			0.26	ns	2
Total Jitter		T_J			0.431	UI	3
Deterministic Jitter		D_J			0.2	UI	
Output Optical Eye		IEEE 802.3z					4
Data Input Swing Differential		V_{IN}	650		2000	mV	5
Input Differential Impedance		Z_{IN}	140	150	160	Ω	
TX Disable	Disable		2.0		Vcc+0.3	V	
	Enable		0		0.8	V	
TX Fault	Fault		Host_V_{CC}-0.5		Host_Vcc+0.3	V	
	Normal		0		0.5	V	
Receiver							
Centre Wavelength		λ_C	1200		1660	nm	
Receiver Sensitivity					-22	dBm	6
Receiver Overload			-3			dBm	
Return Loss			12			dB	
LOS De-Assert		LOS_D			-23	dBm	
LOS Assert		LOS_A	-35			dBm	
LOS Hysteresis			1		4	dB	
Total Jitter		T_J			0.749	UI	3
Deterministic Jitter		D_J			0.462	UI	
Data Output Swing Differential		V_{OUT}	370		2000	mV	5
LOS	High		Host_V_{CC}-0.5		Host_Vcc+0.3	V	
	Low		0		0.5	V	

Note:

1. The optical power is launched into SMF.
2. Unfiltered, measured with a PRBS 2^7-1 test pattern @1.25Gbps
3. Measured with a PRBS 2^7 –1 test pattern@1.25Gbps, meet the specified maximum output jitter requirements if the specified maximum input jitter is present.
4. Measured with a PRBS 2^7 –1 test pattern@1.25Gbps.
5. AC coupled and terminated.
6. Worst-case Extinction Ration, measured with a PRBS 2^7 –1 test pattern@1.25Gbps, BER≤1×10^{-12}.

EEPROM Information

The SFF-8053 defines a 256-byte memory map in EEPROM describing the transceiver's capabilities, standard interfaces, manufacturer, and other information, which is accessible over a 2 wire serial interface at the 8-bit address 1010000X (A0h). The memory contents refer to Table 5

Table 5 - EEPROM Serial ID Memory Contents (A0h)

Addr.	Field Size (Bytes)	Name of Field	Hex	Description
0	1	Identifier	01	GBIC
1	1	Ext. Identifier	04	MOD4
2	1	Connector	01	SC
3—10	8	Transceiver	00 00 00 02 10 10 01 01	Transmitter Code
11	1	Encoding	01	8B10B
12	1	BR, nominal	0D	1.25Gbps
13	1	Reserved	00	
14	1	Length (9um)-km	50	80km
15	1	Length (9um)	FF	
16	1	Length (50um)	00	
17	1	Length (62.5um)	00	
18	1	Length (copper)	00	
19	1	Reserved	00	
20—35	16	Vendor name	46 49 42 45 52 58 4F 4E 20 49 4E 43 2E 20 20 20	"FIBERXON INC. "(ASCⅡ)
36	1	Reserved	00	
37—39	3	Vendor OUI	00 00 00	
40—55	16	Vendor PN	46 54 4D 2D 35 30 31 32 53 2D 47 38 30 47 20 20	"FTM-5012S-G80G " (ASCⅡ)
56—59	4	Vendor rev	xx xx xx xx	ASCⅡ("31 30 20 20" means 1.0 revision)
60-62	3	Reserved	00 00 00	
63	1	CC BASE	xx	Check sum of bytes 0 - 62
64—65	2	Options	00 1A	LOS, TX_FAULT and TX_DISABLE
66	1	BR, max	00	
67	1	BR, min	00	
68—83	16	Vendor SN	xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	ASCⅡ
84—91	8	Vendor date code	xx xx xx xx xx xx 20 20	Year (2 bytes), Month (2 bytes), Day (2 bytes)
92—94	1	Reserved	00	
95	1	CC_EXT	xx	Check sum of bytes 64 - 94
96—255	160	Vendor specific		

Note: The "xx" byte should be filled in according to practical case. For more information, please refer to the related document of SFF-8053 Rev 5.5.

Recommended Interface Circuit

Figure 1 shows the recommended interface circuit.

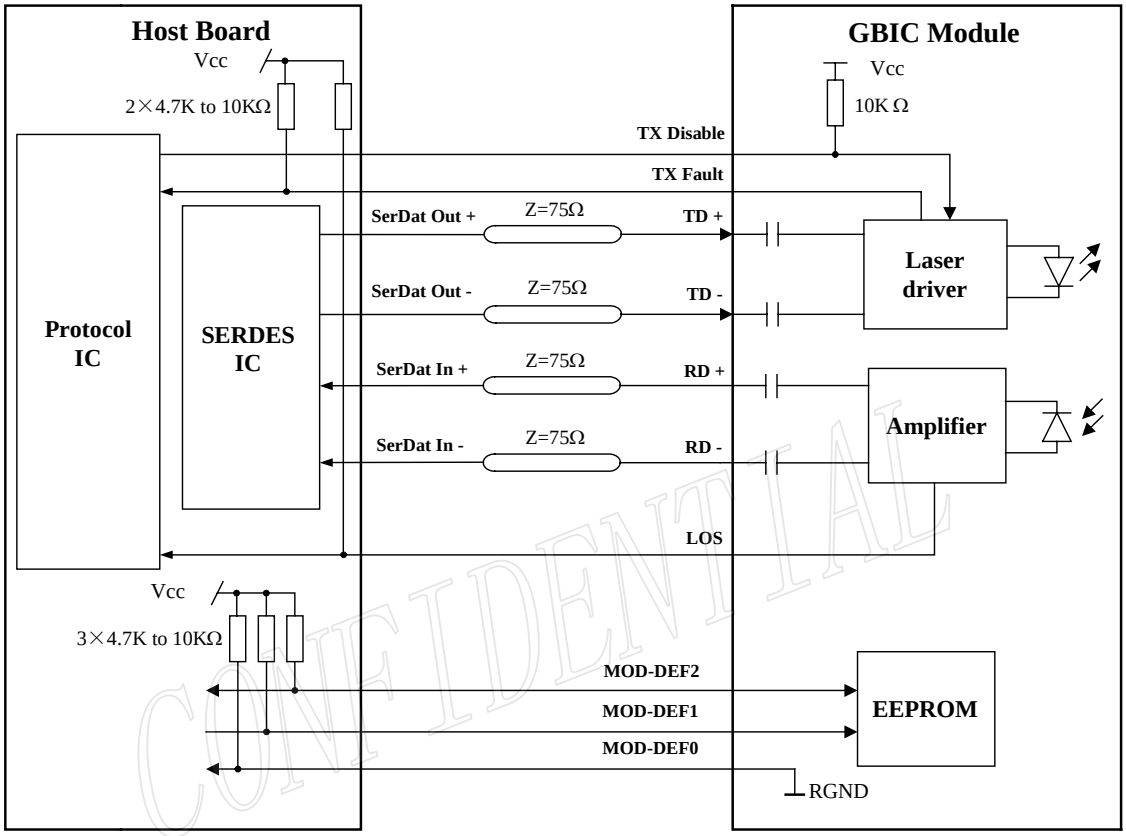


Figure 1, Recommended Interface Circuit

Pin Definitions

Figure 2 below shows the pin numbering of GBIC electrical interface. The pin functions are described in

Table 6.

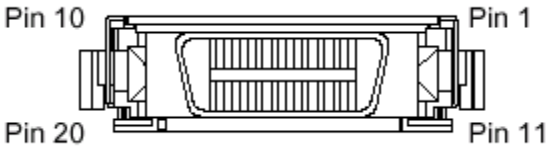


Figure 2, Pin View

Table 6 – Pin Function Definitions

Pin Name	Pin #	Name/Function	Signal Specification
RECEIVER SIGNALS			
RGND	2, 3, 11, 14	Receiver Ground (may be connected with TGND in GBIC)	Ground, to GBIC
$V_{DD}R$	15	Receiver +3.3/5 volt (may be connected with $V_{DD}T$ in GBIC)	Power, to GBIC
-RX_DAT	12	Receive Data, Differential PECL	High speed serial, from GBIC
+RX_DAT	13	Receive Data, Differential PECL	High speed serial, from GBIC
RX_LOS	1	Receiver Loss of Signal, logic high, open collector compatible, 4.7k to 10kΩpull up to $V_{DD}T$ on host	Low speed, from GBIC
TRANSMITTER SIGNALS			
TGND	8, 9, 17, 20	Transmitter Ground (may be connected with RGND internally)	Ground, to GBIC
$V_{DD}T$	16	Transmitter +3.3/5 volt (may be connected with $V_{DD}R$ in GBIC)	Power, to GBIC
+TX_DAT	18	Transmit Data, Differential PECL	High speed serial, to GBIC
-TX_DAT	19	Transmit Data, Differential PECL	High speed serial, to GBIC
TX_DISABLE	7	Transmitter Disable, logic high, open collector compatible, 4.7k to 10kΩpull up to $V_{DD}T$ on GBIC	Low speed, to GBIC
TX_FAULT	10	Transmitter Fault, logic high, open collector compatible, 4.7k to 10kΩpull up to $V_{DD}T$ on host	Low speed, from GBIC
CONTROL SIGNALS			
MOD_DEF(0)	4	TTL low, output	Please reference SFF-8053, Annex D: Module definition “4”
MOD_DEF(1)	5	SCL serial clock signal, input	
MOD_DEF(2)	6	SDA serial data signal, input/output	

Mechanical Design Diagram

The mechanical design diagram is shown in Figure 3.

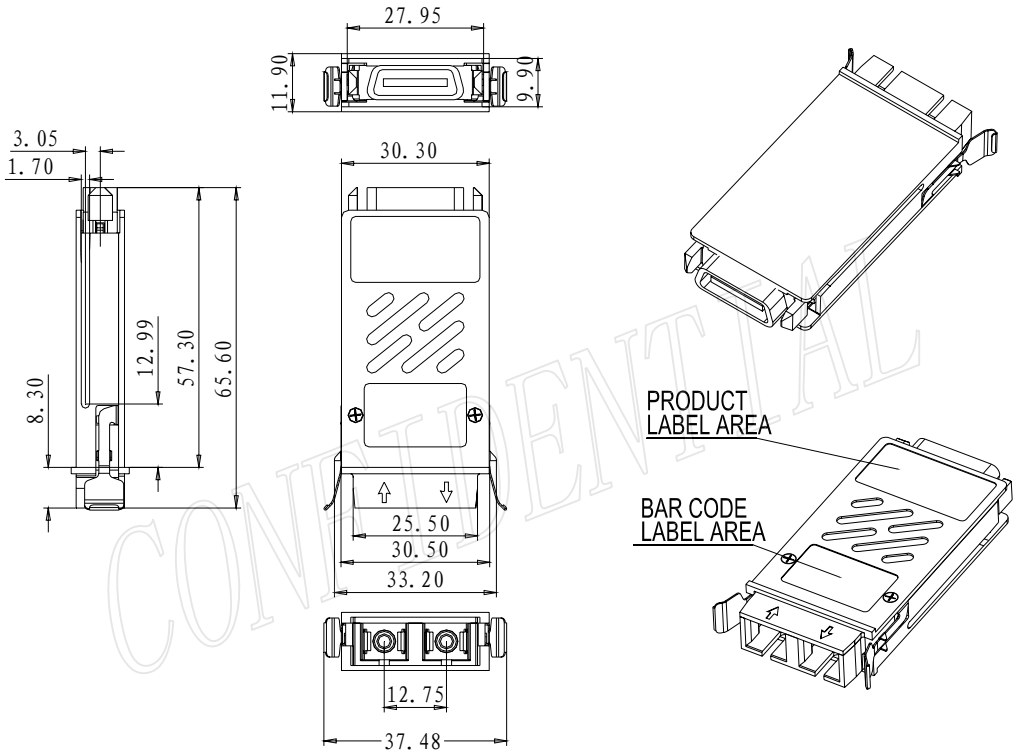
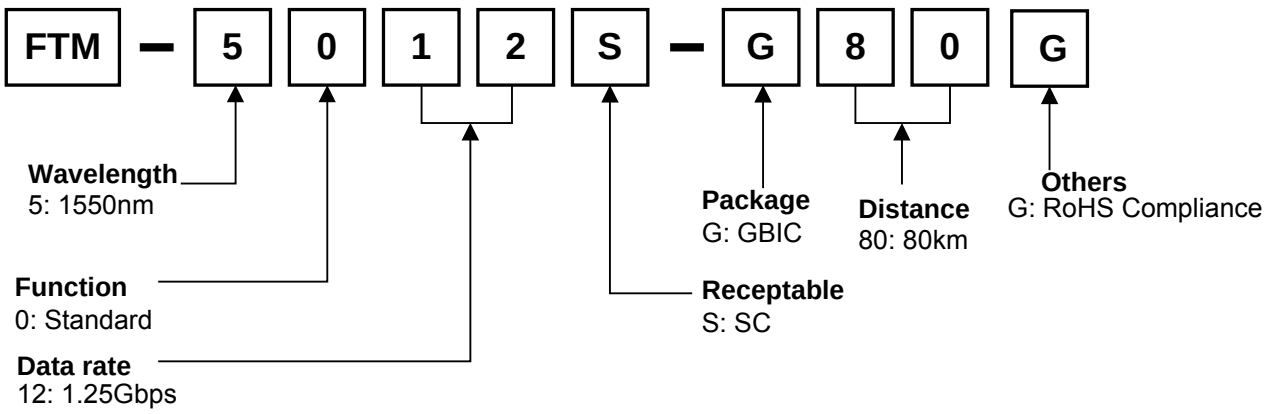


Figure 3, Mechanical Design Diagram of GBIC(1550nm)

Ordering information



Part No.	Product Description
FTM-5012S-G80G	1550nm, 1.25Gbps, 80km, RoHS compliant, GBIC, 0°C~+70°C

Related Documents

For further information, please refer to the following documents:

- *Flexon™ GBIC Installation Guide*
- *Flexon™ GBIC Application Notes*
- *SFF-8053, Proposed Specification for GBIC (Gigabit Interface Converter), Rev 5.5*

Obtaining Document

You can visit our website:

http://www.fiberxon.com

Or contact with Fiberxon, Inc. America Sales Office listed at the end of documentation to get the latest documents.

Revision History

Revision	Initiate	Review	Approve	Subject	Release Date
Rev. 1a	Univer.Yang	Simon.Jiang	Walker.Wei	Initial datasheet	March 24, 2006
Rev. 1b	Univer.Yang	Simon.Jiang	Walker.Wei	Upgrade it to formal edition.	May 18, 2006

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