FOCUS-8512-02 850nm

Multi-mode GBIC

Features

- Compliant with Gigabit Interface Converter (GBIC) Revision 5.5
- Compliant with proposed specifications for IEEE 802.3z/Gigabit Ethernet
- Up to 1.25Gb/s bi-directional data link
- 850nm VCSEL Laser Transmitter
- 550m with 50/125 μm MMF
- Extended power supply +3.3/5.0V compatible
- Hot Pluggable
- Serial ID functionality
- Low EMI and Low power dissipation
- Class 1 Laser Product Compliant with the Requirements of IEC 60825-1 and IEC 60825-2

Applications

- Switch to switch interface
- High speed I/O for file servers
- Bus extension applications

Product Description

Eoptolink's FOCUS-8512-02 is a high performance integrated duplex data link for bi-directional communication over multimode optical fiber. It is compliant with the Gigabit Interface Converter (GBIC) specification Rev. 5.5.

Eoptolink's GBIC transceiver is hot pluggable which allows a suitably designed enclosure to be changed from one type of external interface to another simply by plugging in a GBIC having the alternative external interface.

The converters are suitable for interconnections in the Gigabit Ethernet hubs and switches

environment. The design of these converters is also practical for other high performance, point-to-point communication requiring gigabit or fiber channel interconnections.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	Ts	-40		85	ºC	
Supply Voltage	VCC	0		6	V	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Ambient Operating Temperature	T_A	0		70	ºC	
Supply Voltage	VCC	3.15	3.3/5	5.25	V	
Total Supply Current	I_S			300	mA	
Data Output Load	R_L		75		ohms	

PERFORMANCE SPECIFICATIONS - ELECTRICAL

0ºC<Tc<+80°C; +3.15V<Vcc<+5.25V

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Surge Current	Isurge			+30	mA	above steady state value
TRANSMITTER						
PECL Input (Differential)	Vin	650		2000	mVpp	AC coupled inputs
Input Impedance (Differential)	Zin	135	150	165	ohms	Rin > 100 kohms @ DC
Tx_DISABLE Input Voltage - High		2		VDDT+0.3	V	
Tx_DISABLE Input Voltage - Low		0		0.8	V	
Tx_FAULT Output Voltage -- High		Vcc-0.5		Vcc+0.3	V	Io = 400µ A; Host Vcc
Tx_FAULT Output Voltage -- Low		0		0.5	V	Io = -4.0mA
RECEIVER						
PECL Output (Differential)	V_{out}	400	750	2000	mVpp	AC coupled outputs
Output Impedance (Differential)	Zout	135	150	165	ohms	
Rx_LOS Output Voltage - High		Vcc-0.5		Vcc+0.3	V	lo = 400µ A; Host Vcc
Rx_LOS Output Voltage - Low		0		0.5	V	lo = -4.0mA
Total Jitter [Pk - Pk]	TJ			130	ps	Measured with 27 - 1 PRBS
MOD_DEF (0:2)	V_{oH}	2.5			V	With Serial ID
	V_{oL}	0		0.5	V	

OPTICAL SPECIFICATIONS

0°C<Tc<+80°C; +3.15V<Vcc<+5.25V

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
50μm Core Diameter MMF			550		m	BER<1.0E-12 @ 1.25/1.0625GBaud
62.5μm Core Diameter MMF			300			
TRANSMITTER						
Optical Center Wavelength	λ	830	850	860	nm	
Spectral Width	Δλ			1	nm	RMS
Optical Transmit Power	Po	-9		-4	dBm	Average @850nm
Extinction Ratio	ER	9			dB	P1/P0
Total Jitter	TJ			170	ps	Measured with 2^7 - 1 PRBS
Output Rise Time	tR,		150	300	ps	20-80%; measured unfiltered
Output Fall Time	tF		200	300	ps	20-80%; measured unfiltered
RECEIVER						
Optical Input Wavelength	λ	760	850	860	nm	
Optical Input Power	P_{in}	-17		0	dBm	BER<1.0E-12 @ 1.25/1.0625GBaud
Optical Return Loss	ORL	12			dB	
RX_LOS - Asserted	Pa	-29			dBm	Measured on transition - Low to High
RX_LOS - Deasserted	Pd			-17	dBm	Measured on transition - High to Low

Pin Out Table

Pin Name	Pin#	Sequence	Sequence	Pin#	Pin Name
RX_LOS	1	2	1	11	RGND
RGND	2	2	1	12	-RX_DAT
RGND	3	2	1	13	+RX_DAT
MOD_DEF(0)	4	2	1	14	RGND
MOD_DEF(1)	5	2	2	15	VDDR
MOD_DEF(2)	6	2	2	16	VDDT
TX_DISABLE	7	2	1	17	TGND
TGND	8	2	1	18	+TX_DAT
TGND	9	2	1	19	-TX_DAT
TX_FAULT	10	2	1	20	TGND

Internal interface signal Definition

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
VDDR	15	Receiver +5 volt (may be connected with VDDT 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,4.7 K to 10 K Ohm pullup to VDDT on host	Low speed, from GBIC
Transmitter Signals			
TGND	8,9,17,20	Transmitter Ground (may be connected with RGND internally)	Ground, to GBIC
VDDT	16	Transmitter +5 volt (may be connected with VDDR 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 10 K Ohm pullup to VDDT on GBIC	Low speed, to GBIC
TX_FAULT	10	Transmitter Fault, logic high, open collector compatible,4.7 Kto 10 K Ohm pullup to VDDT on host	Low speed, from GBIC
Control Signals			
MOD_DEF(0)	4	GBIC module definition and presence, bit 0,4.7 K to 10 K Ohm pullup to VDDT on host	Low speed, from GBIC
MOD_DEF(1)	5	GBIC module definition and presence, bit 1,4.7 K to 10 K Ohm pullup to VDDT on host	Low speed, from GBIC
MOD_DEF(2)	6	GBIC module definition and presence, bit 2,4.7 K to 10 K Ohm pullup to VDDT on host	Low speed, from GBIC

Recommend Circuit Schematic

Inputs to the FOCUS-8512-02 transmitter are AC coupled and internally terminated through

75 ohms to AC ground. The advantages of AC couple are as followed:

(1) Close positioning of SERDES with respect to transceiver; allows for shorter line lengths and at gigabit speeds reduces EMI.

(2) Minimum number of external components.

(3) Internal termination reduces the potential for unterminated stubs which would otherwise increase jitter and reduce transmission margin.

These modules can operate with PECL logic level. The input signal must have at least a 650mV peak-to-peak (differential) signal swing. Output from the receiver section of the module is also AC coupled PECL level and is expected to drive into a 75 ohm load. Different termination strategies may be required depending on the particular Serializer/Deserializer chip set used.

Figure 1 illustrates the recommended transmit and receive data line terminations.

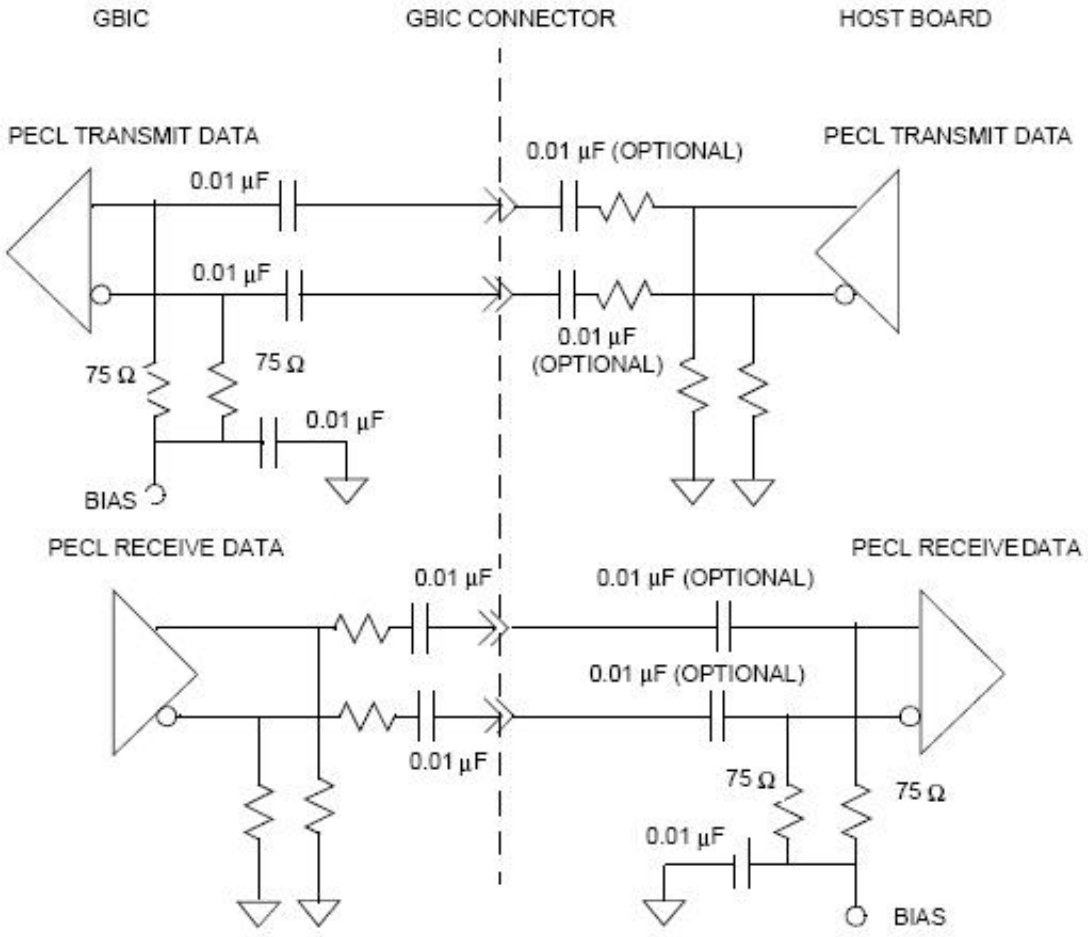

Figure 1: Example of termination circuits for Drivers and Receivers in the host and the GBIC

Mechanical Specifications

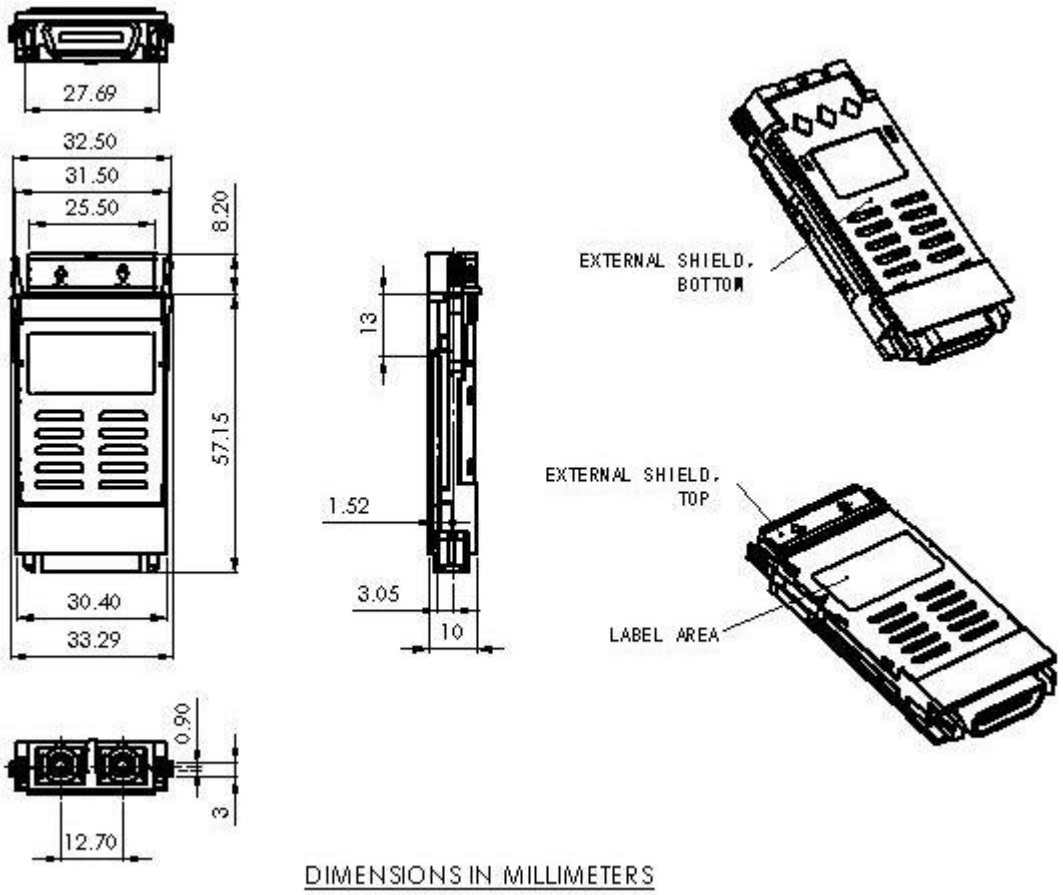

Figure 2: Mechanical Design Diagram

Ordering information

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical interface
FOCUS-8512-02	1.25/1.0625Gbps	850nm VCSEL	MMF	550m	SC