

## Fiber Optic GBIC CWDM DFB 1.25G Lightwave Transceiver

Data Sheet

**OGB3356-XX**



The OGB3356-XX transceiver module operates wavelengths of 1470-1610 nm and at 1.25 Gb/s.

### Features

- Hot-pluggable
- Single +3.3 V to +5.0 V supply
- SC duplex interface, singlemode fiber
- SCA-2 Host connector
- 40 km link distance
- CWDM application
- 1310nm uncooled DFB laser diode
- Low Power Dissipation
- Metal enclosure, low EMI
- Available in wavelengths of 1470, 1490, 1510, 1550, 1570, 1590, and 1610nm
- IEEE 802.3z Gigabit Ethernet compliant
- Fiber Channel compliant
- SFF-8053 Gigabit Interface Converter (GBIC) Specification compliant

### Applications

- Telecommunications and Data Communications system networks
- Router/Server Interface
- Distributed Multi-processing
- Switch-to-switch Interface
- High-speed I/O for File Server

### Description

The OGB3356-XX transceiver provides signal conversion and processing for serial optical data communication applications. It operates over singlemode fiber by converting lightwave information into an electrical signal and vice versa at a data rate of 1.25 Gb/s.

The Gigabit singlemode transceiver is a single unit comprised of a transmitter, a receiver, and a duplex SC receptacle. The high-speed uncooled DFB laser diode and photodiode are provided as a light source and a detector, respectively. This transceiver features hot-pluggable function and is specially developed for distances of up to 40 km.

This dual-fiber connector transceiver is designed for use telecom and datacom networking systems applications at 1.25 Gb/s from a single power supply (+3.3 V to +5.0 V).

**Serial Identification (EEPROM)**

A GBIC transceiver having module definition 4 provides access to sophisticated identification information that describes the GBIC transceiver’s capabilities, standard interface, manufacturer and other information. An EEPROM containing the detailed product information for the host equipment is accessed by the 2-wire serial CMOS EEPROM protocol of the ATMEL AT24C01A. See GBIC specification (SFF-8053) for detailed description.

**Safety**

**Laser Compliance Statement**

The OGB3356-XX is classified as a Class I Laser Product. It complies with IEC 60825-1 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated under recommended operating conditions. Because the transceiver is designed to be inherently eye safe, it does not require open fiber control thus eliminating complex electronics or mechanics.

Caution - use of device other than those specified herein may result in hazardous laser radiation exposure or other damage. Please embrace all customary precautions and discretion while handling this device.

**Performance Specifications**

**Absolute Maximum Ratings**

Stresses in excess of the absolute maximum ratings can cause damage to the optical device. Operations of the optical device are suggested to remain within the recommended operating conditions. Exposure to the absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	T <sub>S</sub>	-40	+85	°C
Power Supply Voltage	V <sub>CC</sub>	-0.5	6.0	V
Input Voltage	V <sub>IN</sub>	-0.5	V <sub>CC</sub>	V
Relative Humidity	RH	5	95	%

**Recommended Operating Conditions**

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	T <sub>OP</sub>	0		70	°C
Supply Voltage	V <sub>CC</sub>	3.1		5.25	V
Supply Current (3.3V)	I <sub>TX</sub> + I <sub>RX</sub>			300	mA
Supply Current (5V)	I <sub>TX</sub> + I <sub>RX</sub>			350	mA

**Transmitter Electro-Optical Interface (V<sub>CC</sub> = 3.1V to 5.25V, T<sub>A</sub> = 0 ~ 70°C)**

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power	P <sub>o</sub>	-5	-2.5	0	dBm
Optical Extinction Ratio	E <sub>r</sub>	9			dB
Center Wavelength	λ <sub>C</sub>	λ <sub>C</sub> -6	λ <sub>C</sub>	λ <sub>C</sub> +7	nm
Spectral Width (-20dB)	Δλ			1	nm
Side Mode Suppression Ratio	SMSR	30			dB
Rise Time/ Fall Time	t <sub>R</sub> / t <sub>F</sub>			260	ps
Relative Intensity Noise	RIN			-120	dB/Hz
Total Jitter	TJ			227	ps
Output Eye				Compliant with	

				IEEE802.3	
Differential Data Input Swing	V <sub>IN</sub>	650		1860	mV
Transmit Fault Output - LOW	Tx_Fault	0.0		0.5	V
Transmit Fault Output - HIGH	Tx_Fault	2.4		V <sub>CC</sub>	C

**Receiver Electro-Optical Specifications (V<sub>CC</sub> = 3.1V to 5.25V, T<sub>A</sub> = 0 ~ 70 °C)**

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Input Power <sup>1</sup> - maximum	P <sub>IN</sub>	-3			dBm
Optical Input Power <sup>1</sup> - maximum (Sensitivity)	P <sub>IN</sub>		-26	-23	dBm
Operating Center Wavelength	λ <sub>C</sub>	1260		1610	Nm
Optical Return Loss	ORL	12			dB
Receiver Electrical 3dB Upper Cutoff Frequency				1500	MHz
Loss of signal - asserted	P <sub>A</sub>	-35			dBm
Loss of signal - deasserted	P <sub>D</sub>			-23	dBm
Differential Data Output Swing	V <sub>OUT</sub>	370		2000	mV
Receiver Loss of Signal Output Voltage - LOW	RX_LOS <sub>L</sub>	0		0.5	V
Receiver Loss of Signal Output Voltage - HIGH	RX_LOS <sub>H</sub>	2.4		V <sub>CC</sub>	V

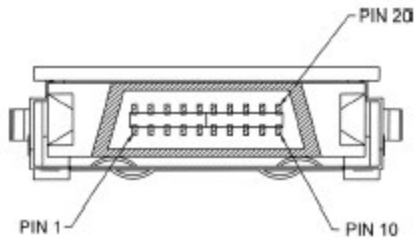
**Notes:**

1. With BER less than 1x10<sup>-12</sup>.

**Timing Parameters for GBIC Management (V<sub>CC</sub> = 3.1V to 5.25V, T<sub>A</sub> = 0 ~ 70 °C)**

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Tx_Disable Assert Time	t <sub>off</sub>			10	μs
Tx_Disable Negate Time	t <sub>on</sub>			1	ms
Time to initialize, include reset of Tx_Fault	t <sub>init</sub>			300	ms
Tx_Fault from fault to assertion	t <sub>fault</sub>			100	μs
Tx_Disable time to start reset	t <sub>reset</sub>	10			μs
Receiver Loss of Signal Assert Time (off to on)	t <sub>ARX_LOS</sub>			100	μs
Receiver Loss of Signal Assert Time (on to off)	t <sub>D,RX_LOS</sub>			100	μs

**Pin Assignment and Plug-in Sequence<sup>1</sup> (1-Gnd and Signal; 2-Power)**



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Pin No.	Name	Description	Input/Output	Notes
1	Rx_LOS	Receiver Loss of Signal	OUT	5
2	RGND	Receiver Ground		1
3	RGND	Receiver Ground		1
4	MOD-DEF 0	TTL LOW	OUT	4
5	MOD-DEF 1	SCL Serial Clock Signal	IN	4
6	MOD-DEF 2	SDA Serial Clock Signal	IN/ OUT	4
7	Tx_Disable	Transmitter Disable	IN	3
8	TGND	Transmitter Ground		1
9	TGND	Transmitter Ground		1
10	Tx_Fault	Transmitter Fault Indication	OUT	2
11	RGND	Receiver Ground		1
12	-Rx_DAT	Receiver Data Differential PECL ac-coupled	OUT	
13	+Rx_DAT	Receiver Data Differential PECL ac-coupled	OUT	
14	RGND	Receiver Ground		1
15	VccR	Receiver Supply	IN	
16	VccT	Transmitter Supply	IN	
17	TGND	Transmitter Ground		1
18	+Tx_DAT	Transmit Data Differential PECL ac-coupled	IN	
19	-Tx_DAT	Transmit Data Differential PECL ac-coupled	IN	
20	TGND	Transmitter Ground		1

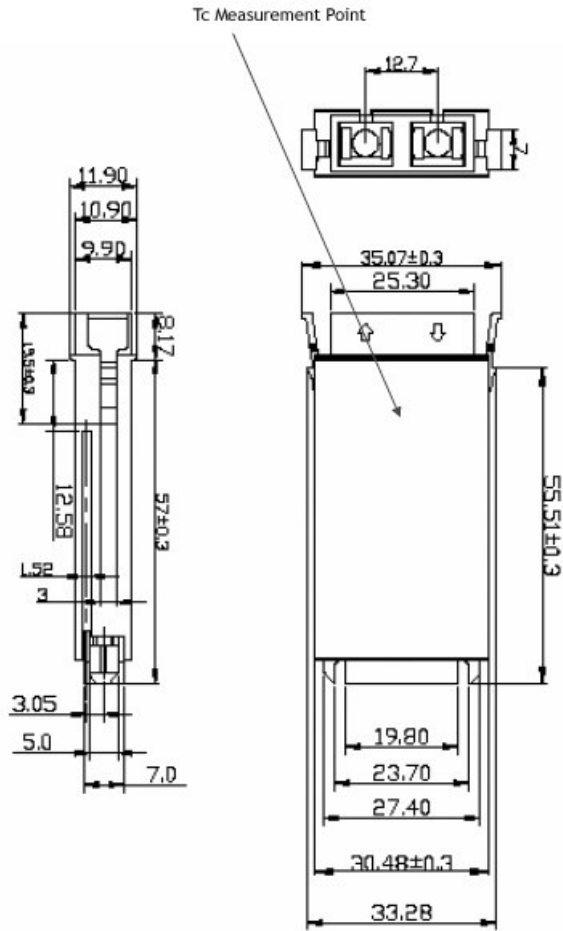
**Note:**

1. Circuit ground is internally isolated from chassis ground.
2. Open-Collector outputs, asserted when LD and/or APC function fails.
3. Disable when high voltage (>2.0V or open).
4. Should be pulled up with 4.7k-10kΩ on host board to a voltage between 2.0V and 5.5V. MOD\_DEF (0) pulls line low to indicate module is plugged in.
5. LOS is open collector output. Should be pulled up with 4.7k-10kΩ on host board to a voltage between 2.0V and 5.5V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

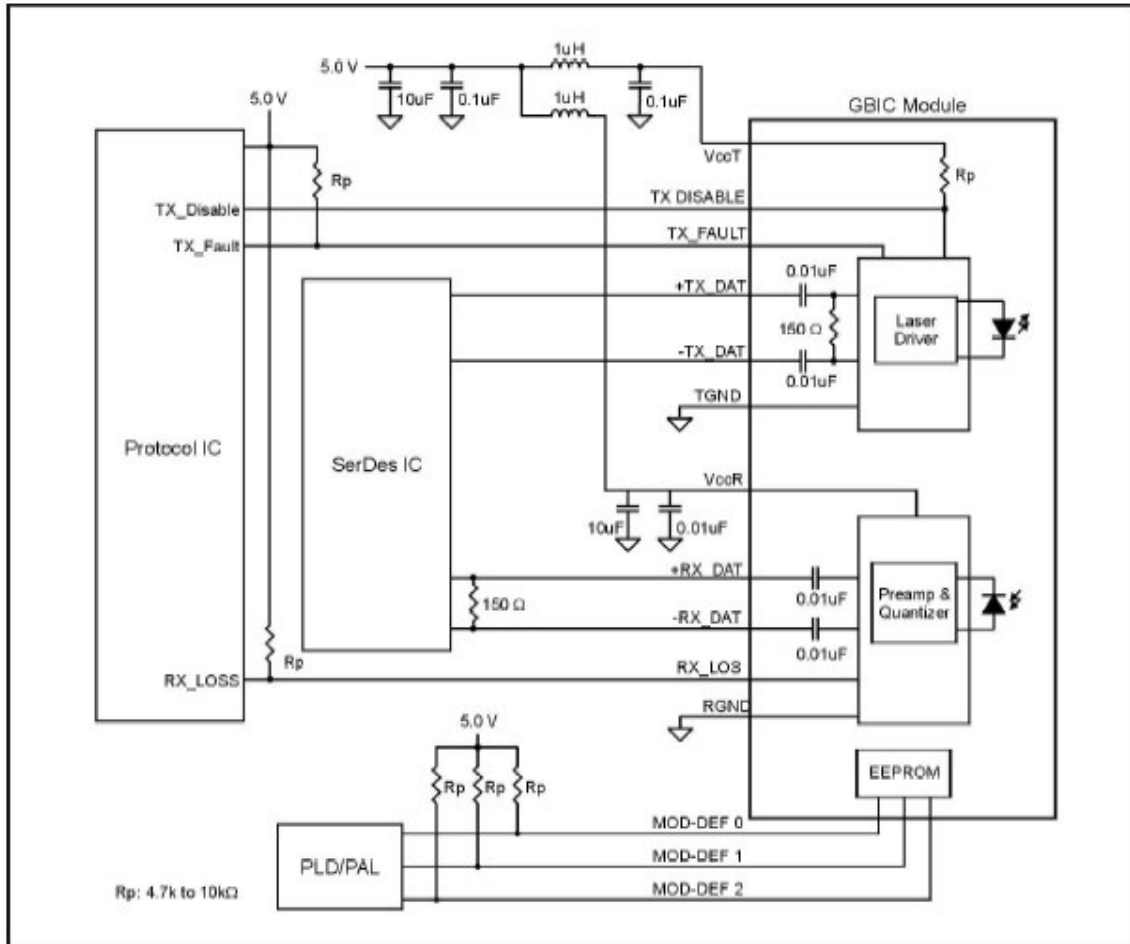
### Physical Characteristics

#### Outline Diagram

Dimensions for the device package are given in millimeters.



Recommended Interface Diagram



Additional Information

Ordering Information

Center Wavelength	Part Number
1470 nm	OGB3356-47
1490 nm	OGB3356-49
1510 nm	OGB3356-51
1530 nm	OGB3356-53
1550 nm	OGB3356-55
1570 nm	OGB3356-57
1590 nm	OGB3356-59
1610 nm	OGB3356-61

**OGB3356-XX GBIC TRANSCEIVER DATA SHEET**

**Contact**

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