

## Fiber Optic GBIC 1310nm FP OC-48 Lightwave Transceiver

Data Sheet

**OGB2431**



The OGB2431 transceiver module operates a wavelength of 1310 nm and at 2.5 Gb/s.

### Features

- Hot-pluggable
- Single +3.3 V to +5.0 V supply
- SC duplex interface, singlemode fiber
- 2 km link distance
- 1310nm uncooled FP laser diode
- Low Power Dissipation
- Metal enclosure, low EMI
- IEEE 802.3z Gigabit Ethernet compliant
- Fiber Channel compliant
- SFF-8053 Gigabit Interface Converter (GBIC) Specification compliant

### Applications

- Telecommunications and Data Communications system networks
- OC-48 SR-1/STM-16 IR-1
- Gigabit Ethernet
- 1x Fiber Channel
- Metro Access Rings
- Point-to-Point Channel

### Description

The OGB2431 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 2.5 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 FP laser diode and a 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 2 km.

This dual-fiber connector transceiver is designed for use in LAN, SAN, WAN for Gigabit Ethernet and Fiber Channel applications at 2.5 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 OGB2431 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	6.0	V
Relative Humidity	RH	5	85	%

#### 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	3.3	5.25	V
Supply Current (I <sub>TX</sub> + I <sub>RX</sub> )	I <sub>CC</sub>		200	300	mA

#### Transmitter Electro-Optical Interface (T<sub>C</sub> = 0 ~ 70°C; V<sub>CC</sub>T,R = 3.1V < V<sub>CC</sub> < 5.25V)

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Transmitter Differential Input Voltage	TD +/-	400		2000	mVp-p
Optical Output Power <sup>1</sup>	P <sub>O</sub>	-9		-3	dBm
Optical Extinction Ratio <sup>1</sup>	E <sub>r</sub>	9			dB
Center Wavelength <sup>1</sup>	λ <sub>C</sub>	1280		1355	nm
Spectral Width (RMS) <sup>1</sup>	Δλ			<2.5	nm
Rise Time/ Fall Time <sup>2</sup>	t <sub>R</sub> / t <sub>F</sub>			0.25	nsec
Tx_Fault - HIGH	V <sub>Fault_H</sub>	2		V <sub>CC</sub>	V
Tx_Fault - LOW	V <sub>Fault_L</sub>	V <sub>EE</sub>		V <sub>EE</sub> +0.5	V
Tx_Disable - HIGH	V <sub>Disable_H</sub>	2		V <sub>CC</sub>	V
Tx_Disable - LOW	V <sub>Disable_L</sub>	V <sub>EE</sub>		V <sub>EE</sub> +0.8	V

**Notes:**

1. Measured at 2488.32 Mbps, PRBS 2<sup>23</sup>-1, NRZ.
2. 20% - 80%.

**Receiver Electro-Optical Specifications ( $T_C = 0 \sim 70^\circ\text{C}$ ;  $V_{CC,T,R} = 3.1\text{V} < V_{CC} < 5.25\text{V}$ )**

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Receiver Differential Output Voltage	RD +/-	600	800		mVp-p
Receiver Overload <sup>1,2</sup>	P <sub>IN</sub> MAX	-3			dBm
Receiver Sensitivity at 1.25 Gbps <sup>1,2</sup>	P <sub>IN</sub> MIN			-18	dBm
Operating Center Wavelength	$\lambda_C$	1270		1620	nm
Receiver LOS Assert Level <sup>2</sup>	P <sub>RX_LOS A</sub>	-35			dBm
Receiver LOS Deassert Level <sup>2</sup>	P <sub>RX_LOS D</sub>			-18.5	dBm
Receiver Loss of Signal Hysteresis <sup>2</sup>		0.5	2		dB

**Notes:**

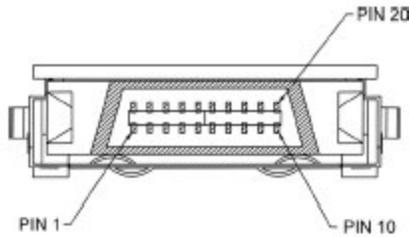
1. With BER better than or equal to  $1 \times 10^{-12}$ .
2. Measured in the center of the eye opening with 2<sup>7</sup>-1 PRBS, NRZ.

**Connector**

Optical Connector: Duplex SC receptacle

Electrical Connector: 20 PIN SCA-2

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



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	

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19	-Tx_DAT	Transmit Data Differential PECL ac-coupled	IN	
20	TGND	Transmitter Ground		1

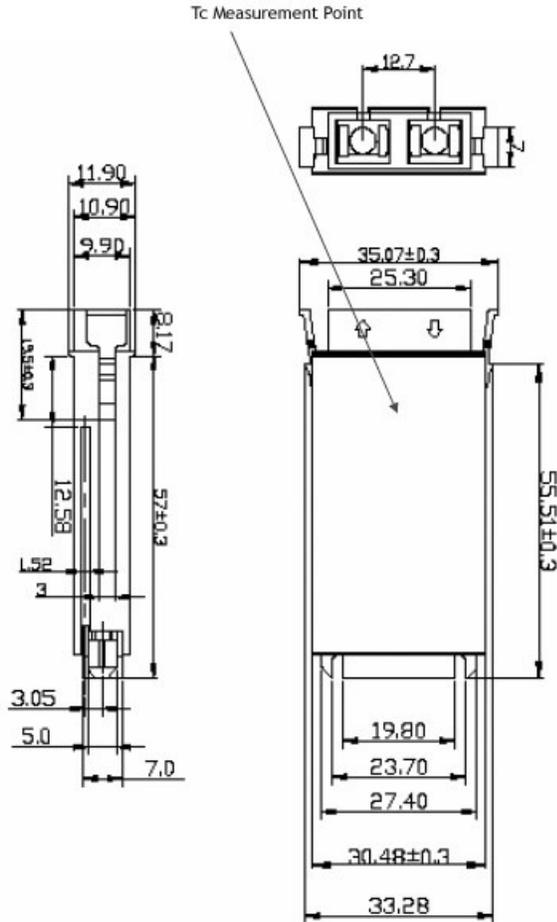
**Note:**

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.

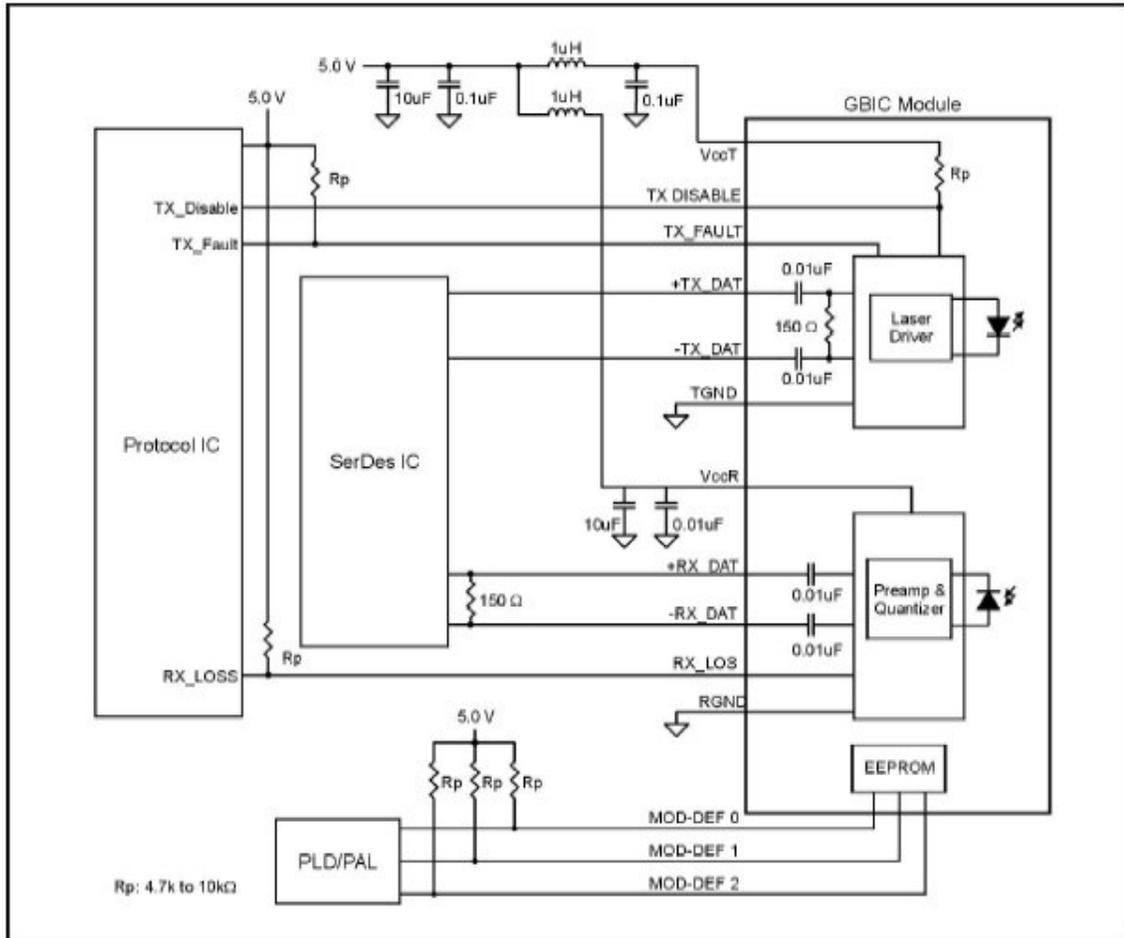
**Physical Characteristics**

**Outline Diagram**

Dimensions for the device package are given in millimeters.



Recommended Interface Diagram



Additional Information

Contact

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