

Fiber Optic GBIC 850 VCSEL 1.25G Lightwave Transceiver

Data Sheet

OGB2300



The OGB2300 transceiver module operates a wavelength of 850 nm and at 1.25 Gb/s for 1000BASE-SX applications.

Features

- Hot-pluggable
- Single +3.3 V to +5.0 V supply
- SC duplex interface, multimode fiber
- 550 m link distance
- 850 nm Vertical Cavity Surface Emitting Laser (VCSEL)
- SFF-8053 Gigabit Interface Converter (GBIC) Specification compliant
- IEEE 802.3z Gigabit Ethernet 1000BASE-SX compliant
- EEPROM with Serial ID Functionality
- Fiber Channel (100-M5-SN-I, 100-M6-SN-I) compliant
- ESD Class 2 per MIL-STD 883D Method 3015.7
- FCC (Class B) and EN 55022 compliant

Applications

- Telecommunications and Data Communications system networks
- Gigabit Ethernet
- Fiber Channel
- SONET/ SDH
- Network devices (bridges/routers/hubs)
- LAN, SAN, WAN

Description

The OGB2300 transceiver provides signal conversion and processing for serial optical data communication applications. It operates over multimode fiber by converting lightwave information into an electrical signal and vice versa at a data rate of 1.25 Gb/s.

The Gigabit multimode transceiver is a single unit comprised of a transmitter, a receiver, and a duplex SC receptacle. This transceiver features hot-pluggable function and is specially developed for distances of up to 550 m with 50/125 μm multimode fibers.

This dual-fiber connector transceiver is designed for use in LAN, SAN, WAN at 1.25 Gb/s from a single power supply (+3.3 V to +5.0 V) for Gigabit Ethernet 1000BASE-SX and Fiber Channel applications.

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 OGB2300 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.

Regulatory Compliance

Feature	Standard	Comments
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD 883D Method 3015.7	Class 1 (>1000V)
Immunity: Electrostatic Discharge (ESD) to the Duplex SC Receptacle	EN 61000-4-2 IEC 1000-4-2	Discharges of ±15kV with an air discharge probe on the receptacle cause no damage.
Immunity: Radio Frequency Electromagnetic Field	EN 61000-4-3 IEC 1000-4-3	With a field strength of 3 V/m rms, noise frequency ranges from 10 MHz to 1 GHz. No effect on transceiver performance between specification limits.
Emission: Electromagnetic Interference (EMI)	FCC Class B EN 55022 Class B CISPR 22	Noise frequency range: 30 MHz to 5 GHz

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 _S	-40	+85	°C
Operating Temperature	T _A	0	70	°C
Power Supply Voltage	V _{CC}	-0.5	6.0	V

Transmitter Electro-Optical Interface (T_A = 25°C)

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Launched Power (Average) ¹	P _o	-9.5		-4	dBm
Center Wavelength	λ _c	830	850	860	nm
Spectral Width (RMS)	Δλ			0.85	nm

OGB2300 GBIC TRANSCEIVER DATA SHEET

Relative Intensity Noise	RIN		-117	dB/Hz
Extinction Ratio (Dynamic)	Er	9		dB
Rise Time, 20% - 80%	t _R		260	ps
Fall Time, 20% - 80%	t _F		260	ps
Total Jitter	TJ		227	ps
Transmitter Disable Voltage	V _{DIS}	V _{CC} -1.3	V _{CC}	V
Transmitter Enable Voltage	V _{EN}	V _{ee}	V _{ee} +0.8	V

Notes:

1. Into a multimode fiber, 50-µm core diameter.

Receiver Electro-Optical Specifications

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Sensitivity (Average Power) ¹	P _{SEN}			-18	dBm
Maximum Receiving Power (Average)	P _{MAX}	0			dBm
Operating Center Wavelength	λ _R	770		860	nm
Signal Loss Deassert Level ²	P _{SLD}			-18	dBm
Signal Loss Assert Level ³	P _{SLA}	-30			dBm
Signal Loss Hysteresis	P _{SLD} -P _{SLA}	0.5		5	dB
Data Output Rise Time (20% - 80%), PECL	t _r			400	ps
Data Output Fall Time (20% - 80%), PECL	t _f			400	ps
PECL Amplitude (Differential, pk-pk)	V _{OUT}	0.4		2.0	V
PECL Skew	T _{SKEW}			200	ps
Return Loss of Receiver	RL	12			dB

Notes:

1. Average optical power at which the BER is 1x10⁻¹². Measured with a 2⁷-1 NRZ PRBS and ER = 9 dB.
2. Optical power above which the SIGNAL LOSS toggles from High to Low state.
3. Optical power below which the SIGNAL LOSS toggles from Low to High state.

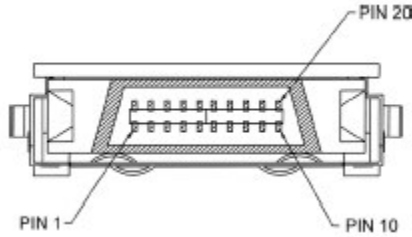
Timing Parameters¹

	Symbol	Min	Max	Units	Condition
Tx Disable Assert Time	t _{off}		10	µs	Time from rising edge of Tx Disable to when the optical output falls below 10% of nominal
Tx Disable Negate Time	t _{on}		1	ms	Time from falling edge of Tx Disable to when the modulated optical output rises above 90% of nominal
Time to initialize, Including reset of Tx Fault	t _{init}		300	ms	From power on or negation of Tx Fault using Tx Disable
Tx Fault Assert Time	t _{fault}		100	µs	Time from fault to Tx fault on
Tx Disable to reset	t _{reset}	10		µs	Time Tx Disable must be held high to reset Tx Fault
LOS Assert Time	t _{loss_on}		100	µs	Time from LOS state to Rx LOS assert
LOS Deassert Time	t _{loss_off}		100	µs	Time from non-LOS state to Rx LOS deassert
Serial ID Clock Rate	f _{serial_clock}		100	kHz	

Note:

1. See GBIC Specifications (SFF-8053) for detailed descriptions of control and status timing requirements.

Pin Assignment and Plug-in Sequence¹ (1-Gnd and Signal; 2-Power)



Pin No.	Name	Description	Plug-in Sequence	Notes
1	Rx_LOS	Receiver Loss of Signal	2	Receiver Loss of Signal, logic high, open collector compatible, 4.7k to 10k Ω pullup to V _{CC} T on host.
2	RGND	Receiver Ground	2	
3	RGND	Receiver Ground	2	
4	MOD-DEF 0	Module Definition 0	2	GBIC module definition and presence, bit 0, 4.7k to 10k Ω pullup to V _{CC} T on host.
5	MOD-DEF 1	Module Definition 1	2	
6	MOD-DEF 2	Module Definition 2	2	
7	Tx_Disable	Transmitter Disable	2	Transmitter Disable, logic high, open collector compatible, 4.7k to 10k Ω pullup to V _{CC} T on GBIC.
8	TGND	Transmitter Ground	2	
9	TGND	Transmitter Ground	2	
10	Tx_Fault	Transmitter Fault Indication	2	Transmitter Fault, logic high, open collector compatible, 4.7k to 10k Ω pullup to V _{CC} T on host.
11	RGND	Receiver Ground	1	
12	-Rx_DAT	Receive Data	1	AC coupled 150 Ω differential lines which should be terminated with 150 Ω (differential) at the user SERDES.
13	+Rx_DAT	Differential PECL	1	
14	RGND	Receiver Ground	1	
15	VccR	Receiver Power	2	5.0 V \pm 5%
16	VccT	Transmitter Power	2	5.0 V \pm 5%
17	TGND	Transmitter Ground	1	
18	+Tx_DAT	Transmit Data	1	AC-coupled, differential lines with 150 Ω differential termination inside the module.
19	-Tx_DAT	Differential PECL	1	
20	TGND	Transmitter Ground	1	

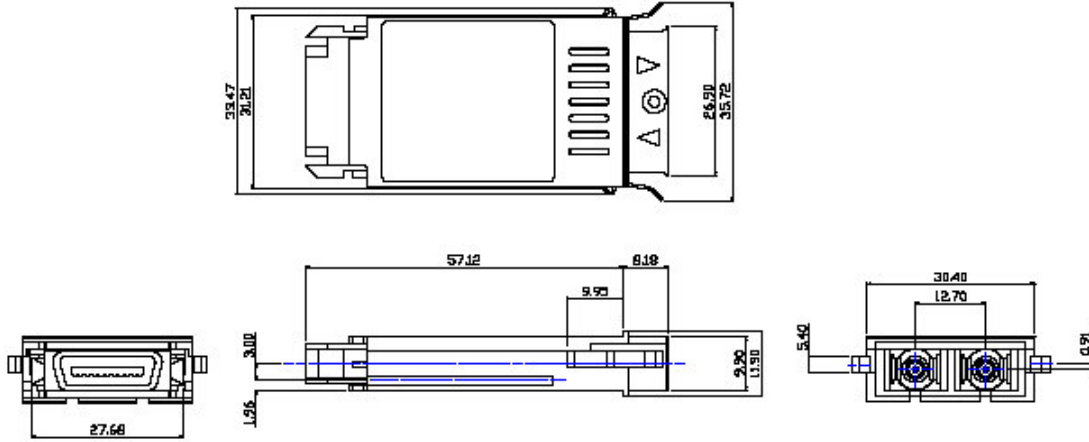
Note:

1. Pin engagement sequence during hot plugging.

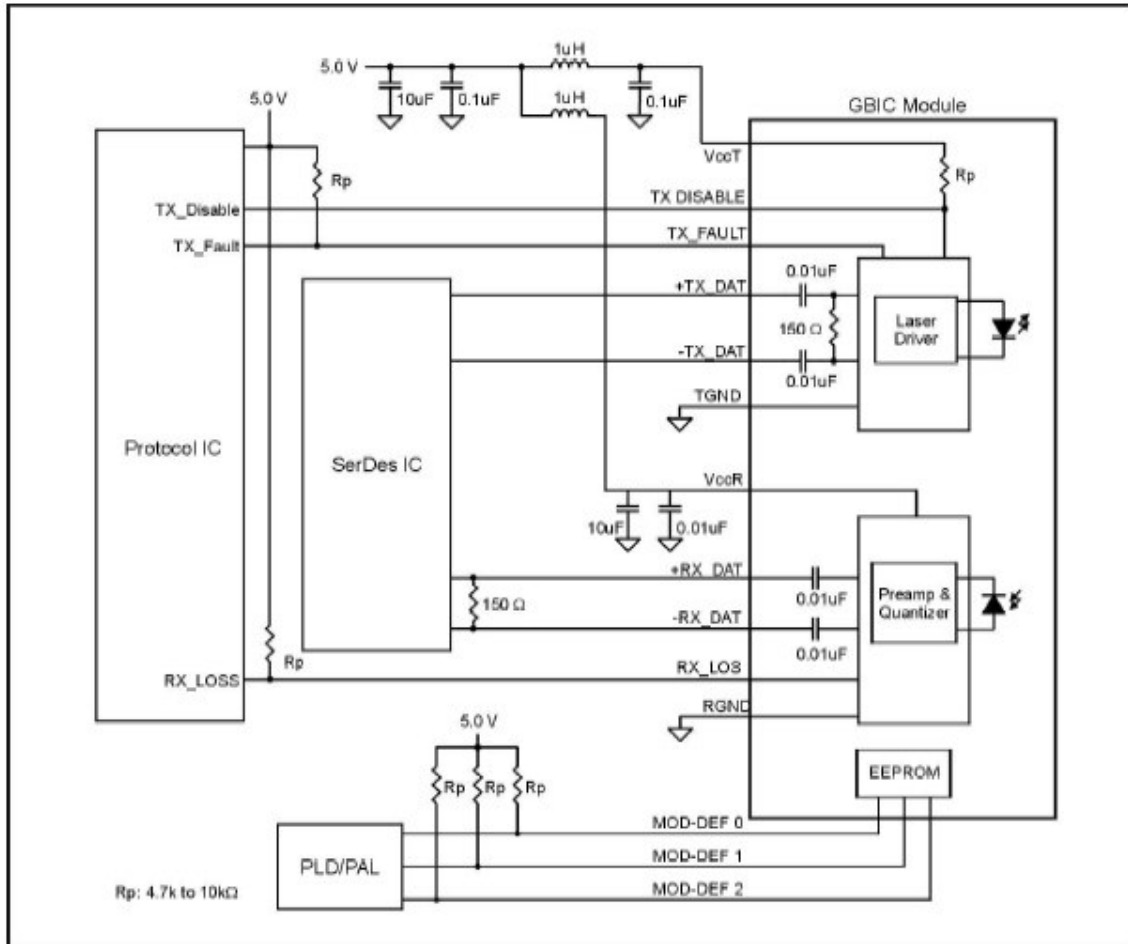
Physical Characteristics

Outline Diagram

Dimensions for the device package are given in millimeters.



Recommended Interface Diagram



Additional Information

Contact

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