

RoHS Compliant

TX-1310/RX-1550 nm Single-mode, Bi-directional Transceiver GBIC, SC

Simplex Connector, 3.3/5.0 V (1000Base-LX, 10km)

1.0625Gbd Fiber Channel/1.25 Gigabit Ethernet

Features

- Compliant with Gigabit Interface Converter Specification
- Compliant with IEEE802.3z Gigabit Ethernet standard
- Compliant with Fiber Channel standard
- SCA-2 Host connector
- Duplex SC connector
- Differential PECL inputs and outputs
- Single power supply 3.3V and 5V
- TTL signal detect indicator
- Hot Pluggable
- Class 1 laser product complies with EN 60825-1



Ordering Information

PART NUMBER	TX/RX	VOLTAGE	TEMPERATURE	LD Type	Distance
AC16-C13B-L2-10	1310/1550	3.3V/5V	0°C to 70 °C	1310 FP	10km

Absolute Maximum Ratings

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Storage Temperature	T_S	-40	85	°C	
Supply Voltage	V_{CC}	-0.5	6.0	V	
Input Voltage	V_{IN}	-0.5	V_{CC}	V	
Output Current	I_o	---	50	mA	
Operating Current	I_{OP}	---	400	mA	

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Recommended Operating Conditions

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Case Operating Temperature	T_C	0	70	°C	
Supply Voltage	V_{CC}	3.1	5.25	V	
Supply Current	$I_{TX} + I_{RX}$	---	300	mA	

Transmitter Electro-optical Characteristics
 $V_{CC} = 3.1 \text{ V to } 5.25 \text{ V}, T_C = 0^\circ\text{C to } 70^\circ\text{C}$

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Output Optical Power 9/125 μm fiber	P_{out}	-9	-6	-3	dBm	Average
Extinction Ratio	ER	9	---	---	dB	
Center Wavelength	λ_C	1270	1310	1355	nm	
Spectral Width (RMS)	$\Delta\lambda$	---	---	3	nm	
Rise/Fall Time, (20–80%)	$T_{r,f}$	---	---	260	ps	
Relative Intensity Noise	RIN	---	---	-120	dB/Hz	
Total Jitter	TJ	---	---	227	ps	
Output Eye	Compliant with IEEE802.3z					
Max. P_{out} TX-DISABLE Asserted	P_{OFF}	---	---	-45	dBm	
Differential Input Voltage	V_{DIFF}	0.4	---	2.0	V	
Transmit Fault Output-Low	TX_FAULT_L	0.0	---	0.5	V	
Transmit Fault Output-High	TX_FAULT_H	2.4	---	V_{CC}	V	
Time to initialize, include reset of TX_FAULT	t_{init}	---	---	300	ms	
TX_FAULT from fault to assertion	t_{fault}	---	---	100	μs	
TX_DISABLE time to start reset	t_{reset}	10	---	---	μs	

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Receiver Electro-optical Characteristics

$V_{CC} = 3.1 \text{ V to } 5.25 \text{ V}$, $T_C = 0^\circ \text{C to } 70^\circ \text{C}$

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Optical Input Power-maximum	P_{IN}	-3	---	---	dBm	BER < 10^{-12}
Optical Input Power-minimum (Sensitivity)	P_{IN}	---	-25	-21	dBm	BER < 10^{-12}
Operating Center Wavelength	λ_C	1480	---	1600	nm	
Optical Return Loss	ORL	14	---	---	dB	
Signal Detect-Asserted	P_A	---	---	-21	dBm	
Signal Detect-Deasserted	P_D	-35	---	---	dBm	
Differential Output Voltage	V_{DIFF}	0.5	---	1.2	V	
Data Output Rise, Fall Time (20–80%)	$T_{r,f}$	---	---	0.35	ns	
Receiver Loss of Signal Output Voltage-Low	RX_LOS_L	0	---	0.5	V	
Receiver Loss of Signal Output Voltage-High	RX_LOS_H	2.4	---	V_{CC}	V	

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Description

Transmitter and Receiver Optical Sub-assembly Section

A 1310 nm InGaAsP laser and an InGaAs PIN photodiode integrate with an WDM filter to form a bi-directional single fiber optical subassembly (OSA). The laser of OSA is driven by a LD driver IC which converts differential input PECL logic signals into an analog laser driving current. And, The photodiode of OSA is connected to a circuit providing post-amplification quantization, and optical signal detection.

TX_FAULT

When sensing an improper power level in the laser driver, the GBIC set this signal high and turns off the Laser. TX_FAULT can be reset with the TX_DISABLE line. The signal is in TTL level.

TX_DISABLE

The TX_DISABLE signal is high (TTL logic "1") to turn off the laser output. The laser will turn on within 1ms when TX_DISABLE is low (TTL logic "0").

Receive Loss (RX_LOS)

The RX_LOS is high (logic "1") when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in TTL level.

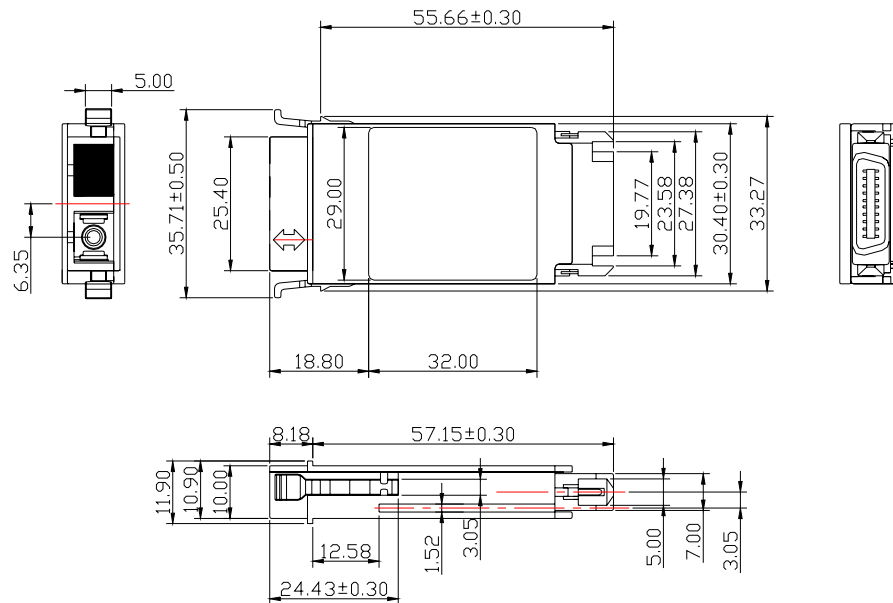
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Dimensions



ALL DIMENSIONS ARE±0.20mm UNLESS OTHERWISE SPECIFIED

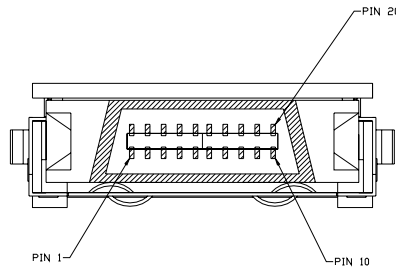
Unit: mm

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Pin Assignment

Pin-Out



Pin	Signal Name	Description
1	<i>RX_LOS</i>	Receiver Loss of Signal, TTL High, open collector
2	<i>R_GND</i>	Receiver Ground
3	<i>R_GND</i>	Receiver Ground
4	<i>MOD_DEF (0)</i>	TTL Low
5	<i>MOD_DEF (1)</i>	SCL Serial Clock Signal
6	<i>MOD_DEF (2)</i>	SDA Serial Data Signal
7	<i>TX_DISABLE</i>	Transmit Disable, internal pull high
8	<i>T_GND</i>	Transmit Ground
9	<i>T_GND</i>	Transmit Ground
10	<i>TX_FAULT</i>	Transmit Fault, TTL High, open collector
11	<i>R_GND</i>	Receiver Ground
12	<i>RX-</i>	Receive Data Bar, Differential PECL, ac coupled
13	<i>RX+</i>	Receive Data, Differential PECL, ac coupled
14	<i>R_GND</i>	Receiver Ground
15	<i>V_CCR</i>	Receiver Power Supply
16	<i>V_CCT</i>	Transmitter Power Supply
17	<i>T_GND</i>	Transmitter Ground
18	<i>TX+</i>	Transmit Data, Differential PCEL, ac coupled
19	<i>TX-</i>	Transmit Data Bar, Differential PCEL, ac coupled
20	<i>T_GND</i>	Transmitter Ground

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Eye Safety Mark

The AC16 series Single-mode transceiver is a class 1 laser product. It complies with EN 60825-1 and FDA 21 CFR 1040.10 and 1040.11. In order to meet laser safety requirements the transceiver shall be operated within the Absolute Maximum Ratings.

Caution

All adjustments have been done at the factory before the shipment of the devices. No maintenance and user serviceable part is required. Tampering with and modifying the performance of the device will result in voided product warranty.

Required Mark

Class 1 Laser Product
Complies with
21 CFR 1040.10 and 1040.11

Note : All information contained in this document is subject to change without notice.