1.25 Gigabit Ethernet-Single Mode Transceiver

1×9, Duplex SC Connector, 1550nm DFB LD for Single Mode Fiber

Features

- 1550nm DFB LD
- Data Rate: 1.25Gbps, NRZ
- Single +3.3V Power Supply
- AC/DC or DC/DC Differential Electrical Interface for SD PECL
- AC/AC Differential Electrical Interface for SD TTL
- Industry Standard 1×9 Output Footprint
- Duplex SC Connector
- Compliance with specifications for IEEE-802.3z Gigabit Ethernet at 1.25 Gbps
- Compliance with ANSI specifications for Fibre Channel applications at 1.06 Gbps
- Class 1 FDA and IEC laser safety compliant

  FDA Accession Number: 0310883-01

Applications

- Gigabit Ethernet links
- Fibre Channel links at 1.06 Gbps
- High speed backplane interconnects
- Switched backbones

Description

The CT-1250TTR-Kx9C-A series from Coretek Opto Corp. are the high performance and cost-effective modules for serial optical data communication applications specified for single mode of 1.25 Gb/s. It operates with +3.3V power supply. The module is intended for single-mode fiber, operates at a nominal wavelength of 1550nm and complies with the industry standard 1x9 footprint. Each module consists of a transmitter optical subassembly, a receiver optical subassembly and an electrical subassembly. All of them are housed in a plastic package and the combination produces a reliable component.

The module is a dual fiber connector transceiver designed for use in Gigabit Ethernet applications and to provide IEEE-802.3z compliant link for 1.25Gb/s long reach applications. The characteristics are performed in accordance with Telcordia Specification GR-468-CORE.

EMC

Most equipment utilizing high-speed transceivers will be required to meet the following requirements:

1) FCC in the United States
2) CENELEC EN55022 (CISPR 22) in Europe

To assist the customer in managing the overall equipment EMC performance, the transceivers have been designed to satisfy FCC class B limits and provide good immunity to radio-frequency electromagnetic fields.

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02/18/2008
Version：A

Eye Safety

This laser based single mode transceiver is a Class 1 product. It complies with IEC 60825-1/A2: 2001 and FDA performance standards for laser products (21 CFR 1040.10 and 1040.11) except for deviations pursuant to Laser Notice 50, dated July 26, 2001.

CLASS 1 LASER PRODUCT

To meet laser safety requirements the transceiver shall be operated within the Absolute Maximum Ratings.

Note: All adjustments have been made at the factory prior to shipment of the devices. No maintenance or alteration to the device is required. Tampering with or modifying the performance of the device will result in voided product warranty. Failure to adhere to the above restrictions could result in a modification that is considered an act of "manufacturing", and will require, under law, recertification of the modified product with the U.S. Food and Drug Administration (ref. 21 CFR 1040.10 (i)).

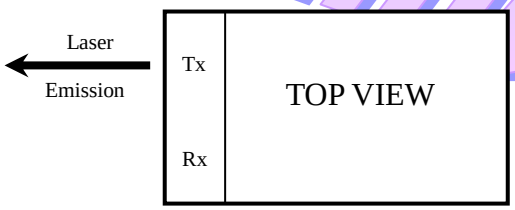
Laser Emission Data

Wavelength : 1550 nm

Maximum total output power : 10.1 mW / 10 dBm

(as defined by IEC : 3.5 mm aperture at 14 mm distance)

Beam divergence (full angle) / NA (half angle) : 20° / 0.18 rad



Required Labels

IEC : "Class 1 Laser Product"

FDA : "Complies with 21 CFR 1040.10 and 1040.11"

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Product Information

Model Number	Operating Voltage & SD Output	Distance	LD Type & Wavelength	Output Power	Sensitivity
CT-1250TTR-K29C-A	*3.3V PECL DC/DC*	*100 km*	*1550 nm DFB*	*0 ~ +5 dBm*	*≦-30 dBm*
CT-1250TTR-KB9C-A	*3.3V TTL AC/AC*				

ABSOLUTE MAX RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Storage Temperature	T_S	-40	85	℃	
Supply Voltage	V_{CC}	0	6	V	
Lead Soldering Temperature/Time	T_{SOLD}		260	℃	10 sec on lead
Data Input Voltage	---	0	Vcc	V	

OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Ambient Operating Temperature	T_A	-40		85	℃	
Supply Voltage	V_{CC}	3.1		3.5	V	
Data Input Voltage Swing	V_{ID}	300		1660	mV	

ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Transmitter					
Transmitter Supply Current	I_{CCT}		200	mA	
Transmitter Data Input Current – Low	I_{IL}	-350		μA	
Transmitter Data Input Current – High	I_{IH}		350	μA	
Transmitter Data Input Voltage – Low	V_{IL}-V_{CC}	-1.84	-1.6	V	
Transmitter Data Input Voltage – High	V_{IH}-V_{CC}	-1.1	-0.9	V	
Receiver					
Receiver Supply Current	I_{CCR}		100	mA	
Receiver Data Output Voltage – Low	V_{OL}-V_{CC}	-1.84	-1.6	V	1
Receiver Data Output Voltage – High	V_{OH}-V_{CC}	-1.1	-0.9	V	1
Signal Detect Output Voltage – Low (for PECL)	V_{OL}-V_{CC}	-1.84	-1.6	V	1
Signal Detect Output Voltage – High (for PECL)	V_{OH}-V_{CC}	-1.1	-0.9	V	1
Signal Detect Output Voltage – Low (for TTL)	V_{OL}		0.8	V	
Signal Detect Output Voltage – High (for TTL)	V_{OH}	2.0		V	

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TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Optical Output Power	Po	0		5	dBm	2
Extinction Ratio	ER	9			dB	
Center Wavelength	λ_c	1530	1550	1570	nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
RIN	RIN			-120	dB/Hz	
Optical Rise time (20%-80%)	t_r			260	ps	3
Optical Fall time (20%-80%)	t_f			260	ps	3
Output Eye	Compliant with IEEE802.3z/D5.0					

RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Maximum Input Optical Power	P_{max}	-3			dBm	4
Receiver Sensitivity	P_{min}			-30	dBm	4
Operating Wavelength	λ	1100		1600	nm	
Optical Return Loss	ORL	12			dB	
Receiver Electrical 3dB Upper Cutoff Frequency	---			1500	MHz	
Signal Detect - Asserted	P_A			-29	dBm	5
Signal Detect - Deasserted	P_D	-42			dBm	6

Notes:

1. These outputs are compatible with 10K, 10KH, 100K ECL and PECL inputs.
2. Measured average power coupled into 9/125 μm single-mode fiber.
3. These are 20-80% values.
4. Measured with 2^7-1 PRBS at BER<10^{-12}
5. Measured on transition – low to high
6. Measured on transition – high to low

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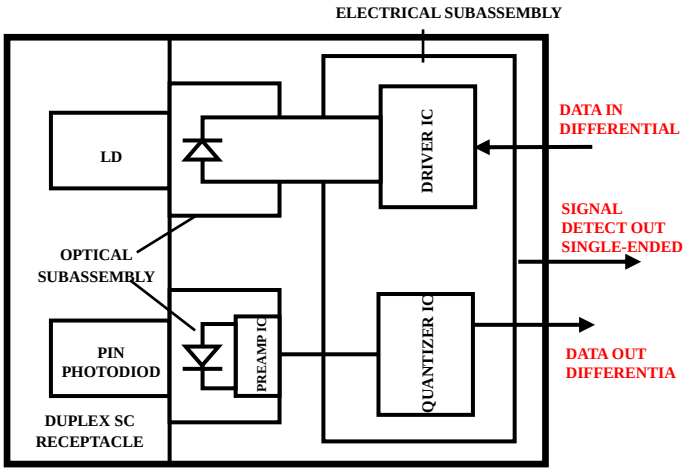
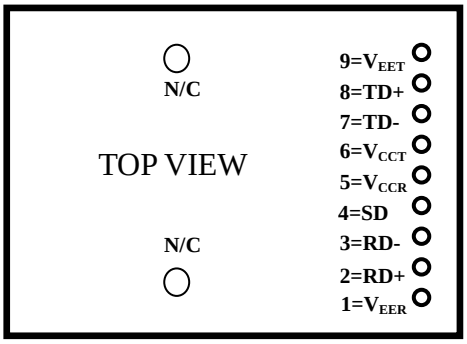
BLOCK DIAGRAM OF TRANSCEIVER



PIN OUT DIAGRAM OF TRANSCEIVER

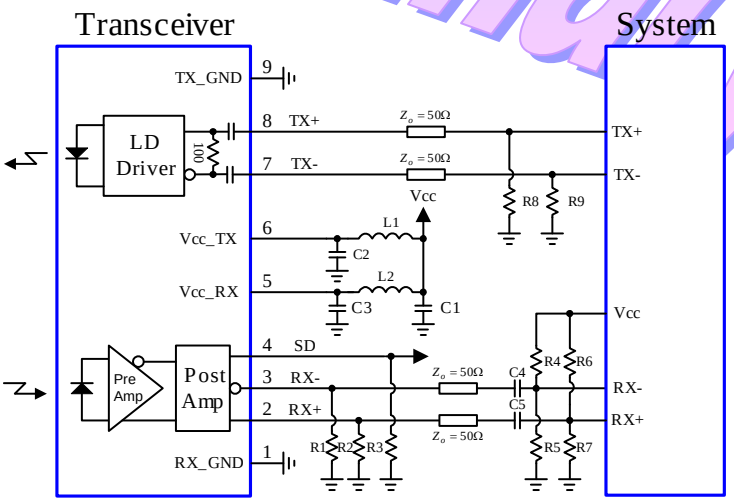


PIN OUT TABLE

Pin	Symbol	Functional Description
Mounting Posts		The mounting posts are provided for transceiver mechanical attachment to the circuit board. They should not be connected to the circuit ground but can be connected to the chassis ground.
1	V_{EER}	Receiver Signal Ground
2	RD+	Receiver Data Non-inverted Differential Output
3	RD-	Receiver Data Inverted Differential Output
4	SD	Signal Detect is a PECL or TTL output. A high level indicates a received optical signal
5	V_{CCR}	Receiver Power Supply
6	V_{CCT}	Transmitter Power Supply
7	TD-	Transmitter Data Inverted Differential Input
8	TD+	Transmitter Data Non-inverted Differential Input
9	V_{EET}	Transmitter Signal Ground

RECOMMENDED CIRCUIT SCHEMATIC

1) SD PECL DC/DC Module



C1 = 4.7μ F L1/L2 = 1μ H C2/C3/C4/C5=0.1μ F
R1/R2=150Ω (3.3V) R3=270Ω (3.3V)
R1/R2=300Ω (5V) R3=510Ω (5V)
R4,R5,R6,R7,R8,R9 depend on System chip

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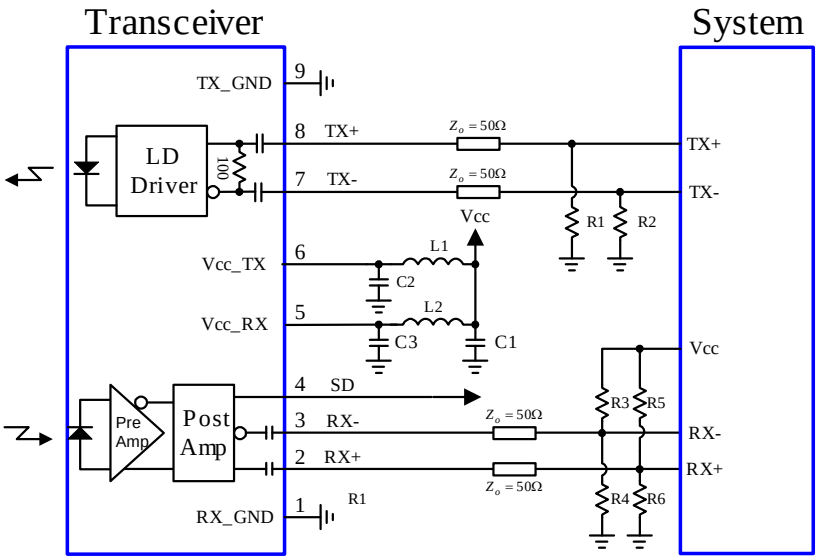
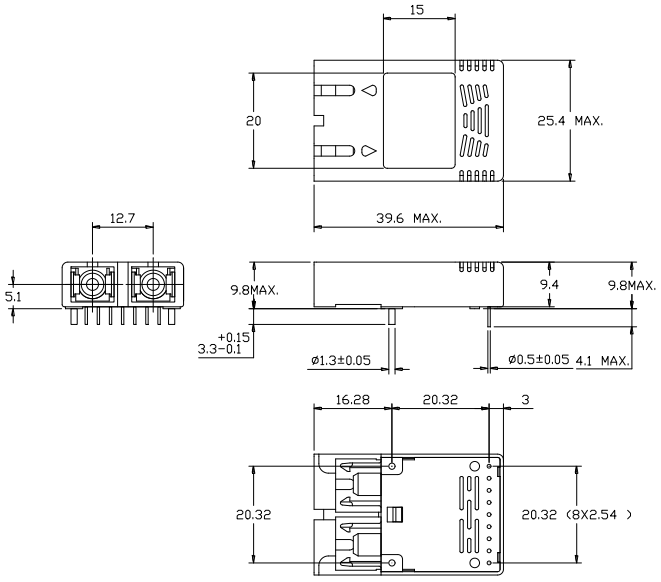
2) SD TTL AC/AC Module



C1 = 4.7μ F L1/L2 = 1μ H C2/C3/C4/C5=0.1μ F
R1,R2,R3,R4,R5,R6 depend on System chip

MECHANICAL DIMENSIONS

Units in mm



DIMENSIONS ARE IN MILLIMETERS.
ALL DIMENSIONS ARE ±0.1mm UNLESS OTHERWISE SPECIFIED.

CORETEK Opto Corp. reserves the right to make changes in the specification described hereinafter without prior notice.

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