

1.25 Gigabit Ethernet-Single Mode Transceiver



1×9, Duplex SC Connector, 1310nm/LD for Single Mode Fiber

Product Information:

Model Number	Wavelength	Operating Voltage	Signal Detect Output	Distance	Chassis Shield
CT-1250STR-M34C	1310 nm	3.3/5V	PECL	10 km	No
CT-1250STR-M34C-B	1310 nm	3.3/5V	PECL	10 km	Backward
CT-1250STR-M34C-F	1310 nm	3.3/5V	PECL	10 km	Forward



Features

- 1310nm MQW-FP LD
- Data Rate: 1.25Gbps, NRZ
- Single +3.3V or +5V Power Supply
- AC/DC or DC/DC Differential Electrical Interface
- Industry Standard 1×9 Output Footprint
- Duplex SC Connector
- Compliance with specifications for IEEE-802.3z Gigabit Ethernet (1000Base-LX) at 1.25 Gbps
- Compliance with ANSI specifications for Fiber Channel applications at 1.06 Gbps
- Eye Safety
Designed to meet Laser Class 1 comply with EN60825-1

Applications

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

Description

The CT-1250STR-M34C from Coretek Opto Corp. is a high performance and cost-effective module for serial optical data communication applications specified for single mode of 1.25 Gb/s. It operates with +5V or +3.3V power supply. The module is intended for single-mode fiber, operates at a nominal wavelength of 1310nm 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 intermediate 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.

Eye Safety

The transceivers have been designed to meet Class 1 eye safety and comply with EN 60825-1.

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ABSOLUTE MAX RATINGS

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

OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Ambient Operating Temperature	T_A	0		70	$^{\circ}\text{C}$	
Supply Voltage	V_{CC}	3.1		5.5	V	
Data Input Voltage Swing	V_{ID}	400		1660	mV	

ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Transmitter					
Transmitter Supply Current	I_{CCT}		140	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	$V_{OL}-V_{CC}$	-1.84	-1.6	V	1
Signal Detect Output Voltage – High	$V_{OH}-V_{CC}$	-1.1	-0.9	V	1

TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Optical Output Power	P_o	-9.5		-3	dBm	2
Extinction Ratio	ER	9			dB	
Center Wavelength	λ_c	1270	1310	1355	nm	
Spectral Width (RMS)	$\Delta \lambda$			4	nm	
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}			-21	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			-21	dBm	5
Signal Detect - Deasserted	P_D	-35			dBm	6

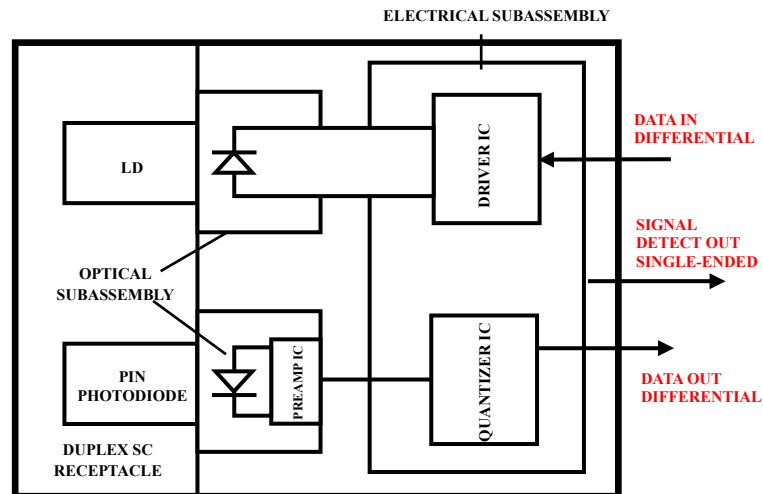
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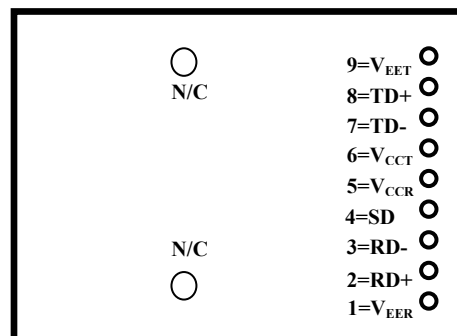
Notes:

1. These outputs are compatible with 10K, 10KH, 100K ECL and PECL inputs.
2. Measured average power coupled into 9/125 μ m 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

BLOCK DIAGRAM OF TRANSCEIVER



PIN OUT DIAGRAM OF TRANSCEIVER



Pin	Symbol	Functional Description
Mounting Posts		
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 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

CORETEK

The schematic diagram illustrates the electrical connections between a Transceiver IC and a System IC. The Transceiver section includes an LD Driver connected to TX+ and TX- pins via 50Ω series resistors, and a Pre Amp followed by a Post Amp connected to RX+ and RX- pins via 50Ω series resistors. Power supply pins Vcc_TX and Vcc_RX are connected to the system's Vcc through decoupling capacitors C1-C5 and inductors L1-L2. Grounding is established at TX_GND and RX_GND. The System section shows the external termination network for the TX and RX lines, consisting of resistors R8-R9 and R4-R7 respectively.

Transceiver

System

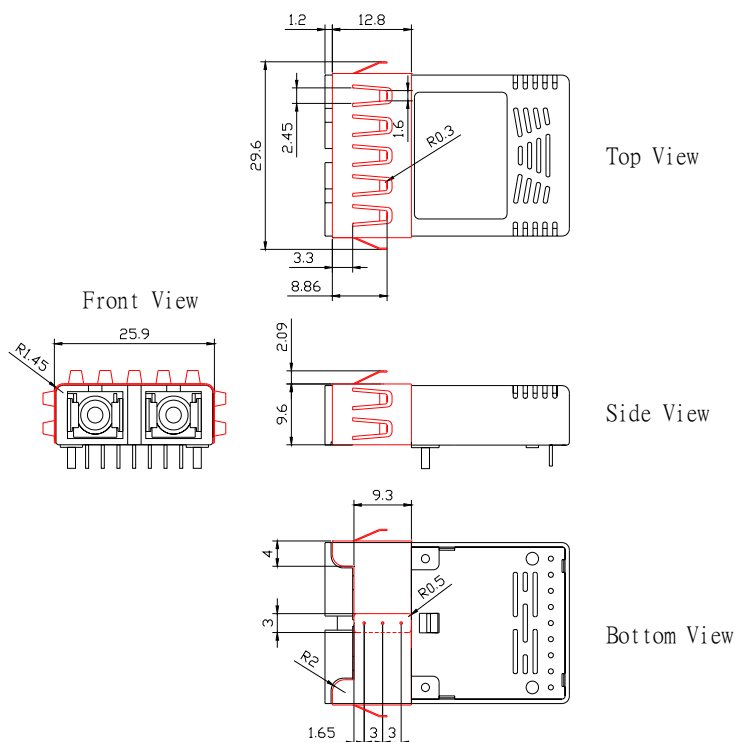
TX_GND 9
LD Driver
TX+ 8
TX- 7
 $Z_o = 50\Omega$
 $Z_o = 50\Omega$
Vcc
Vcc_TX 6
L1
C2
Vcc_RX 5
L2
C3
SD 4
Pre Amp
Post Amp
RX- 3
RX+ 2
RX_GND 1
 R_1, R_2, R_3
 $Z_o = 50\Omega$
 $Z_o = 50\Omega$
 $Z_o = 50\Omega$
R8
R9
Vcc
R4
R6
RX-
RX+
R5
R7

C1 = 4.7 μ F L1/L2 = 1 μ H C2/C3/C4/C5=0.1 μ F
 $R_1/R_2=150\Omega$ (3.3V) $R_3=270\Omega$ (3.3V)
 $R_1/R_2=300\Omega$ (5V) $R_3=510\Omega$ (5V)
 R_4,R_5,R_6,R_7,R_8,R_9 depend on System chip

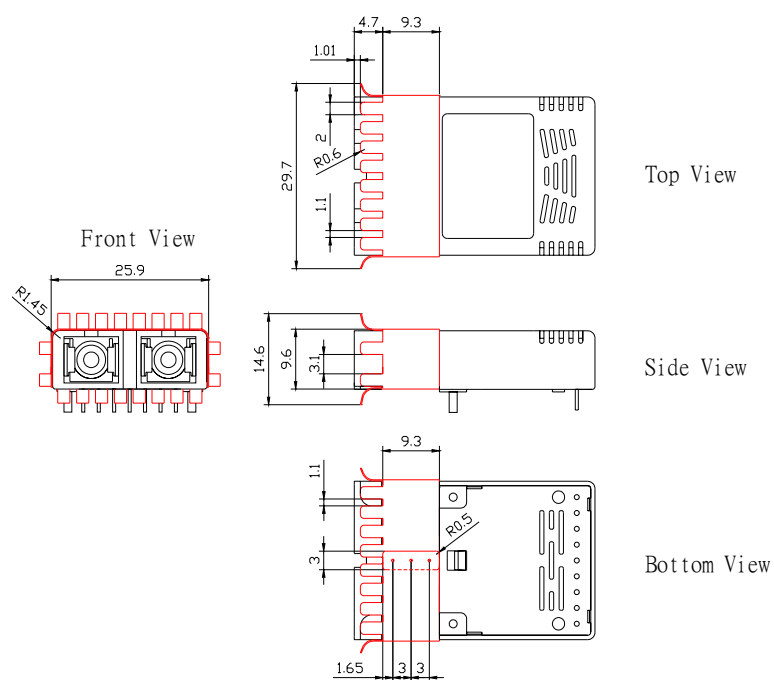
Units in mm



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Backward Shield Type



Forward Shield Type

Claim:

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