

# 155Mbps ATM-Single Mode Transceiver



**SFP, Duplex LC Connector, 1550nm DFB LD for Single Mode Fiber, RoHS Compliant**

*Digital Diagnostics Functions, Extended Operating Temperature from -40 to +85 °C*



## Features

- 1550nm DFB LD
- Data Rate: 155Mbps, NRZ
- Single +3.3V Power Supply
- RoHS Compliant and Lead-free
- AC/AC Differential Electrical Interface
- Compliant with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP)
- Compliant with SFF-8472 Digital Diagnostic Monitoring Interface
- Duplex LC Connector
- Compliance with 100Base-FX of IEEE802.3u Standard
- Compliance with ESD contact discharge EN 61000-4-2 level 4
- Compliance with ATM Standard

## Applications

- Fast Ethernet
- FDDI
- ATM/SONET OC-3/SDH STM-1
- Single mode fiber links
- Optical-Electrical Interface Conversion

## Description

The CT-0155TSP-KBBL-E from Coretek Opto Corp. is the high performance and cost-effective module for serial optical data communication applications specified for single mode of 155 Mb/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 Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP). Each module is integrated digital diagnostics functions via an I<sup>2</sup>C serial interface.

The module is a duplex LC connector transceiver designed to provide an ATM/SONET OC-3/SDH STM-1 compliant link for 155 Mb/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.

## 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.

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## Product Information

Model Number	Operating Voltage & SD Output	Power Budget	LD Type & Wavelength	Output Power	Sensitivity
CT-0155TSP-KBBL-E	3.3V TTL AC/AC	43dB	1550 nm DFB	+1 ~ +5 dBm	$\leq -42$ dBm

## 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	
Data Input Voltage	---	0	$V_{CC}$	V	

## OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Case Operating Temperature	$T_C$	-40		85	$^{\circ}\text{C}$	
Supply Voltage	$V_{CC}$	3.1		3.5	V	
Data Input Voltage Swing	$V_{ID}$	400		1600	mV	
Supply Current	$I_S$			300	mA	

## ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
<b>Transmitter</b>					
Transmitter Supply Current	$I_{CCT}$		200	mA	
Tx_Disable Input Voltage - Low	$V_{IL}$	0	0.8	V	
Tx_Disable Input Voltage - High	$V_{IH}$	2.0	$V_{CC}$	V	
Tx_Fault Output Voltage - Low	$V_{OL}$	0	0.8	V	
Tx_Fault Output Voltage - High	$V_{OH}$	2.0	$V_{CC}$	V	
<b>Receiver</b>					
Receiver Supply Current	$I_{CCR}$		100	mA	
Receiver Data Output Differential Voltage	$V_{OD}$	0.4	1.3	V	
Rx_LOS Output Voltage - Low	$V_{OL}$	0	0.8	V	
Rx_LOS Output Voltage - High	$V_{OH}$	2.0	$V_{CC}$	V	
MOD_DEF (1) , MOD_DEF (2) - Low	$V_{IL}$	-0.6	$V_{CC} \times 0.3$	V	
MOD_DEF (1) , MOD_DEF (2) - High	$V_{IH}$	$V_{CC} \times 0.7$	$V_{CC} + 0.5$	V	

## TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Optical Output Power	$P_o$	1		5	dBm	1
Extinction Ratio	ER	10			dB	
Center Wavelength	$\lambda_c$	1530	1550	1570	nm	
Spectral Width (-20dB)	$\Delta \lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Rise time ( 10%-90% )	$t_r$			2.0	ns	
Optical Fall time ( 10%-90% )	$t_f$			2.0	ns	
Output Eye		Compliant with ITU recommendation G.957				

\* The laser shutdown is deactivated.

## RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Maximum Input Optical Power	$P_{max}$	-9			dBm	2
Receiver Sensitivity	$P_{min}$			-42	dBm	2
Operating Wavelength	$\lambda$	1100		1600	nm	
Loss of Signal - Asserted	$P_A$	-53			dBm	
Loss of Signal - Deasserted	$P_D$	$P_A + 0.5$		-41	dBm	
Loss of Signal - Hysteresis	$P_D - P_A$	0.5		4	dB	

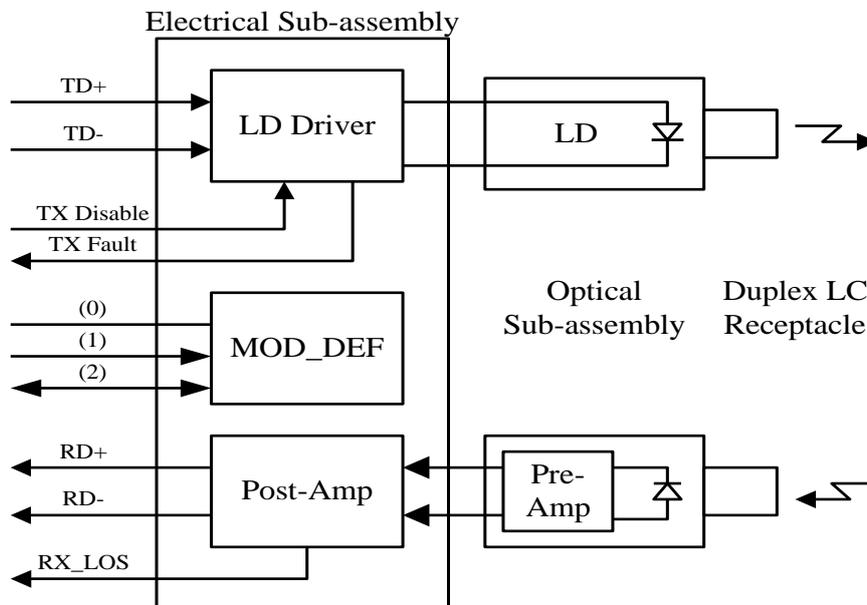
### Notes:

1. Measured average power coupled into 9/125  $\mu$  m single mode fiber.
2. Measured with  $2^{23}-1$  PRBS at BER <  $10^{-10}$

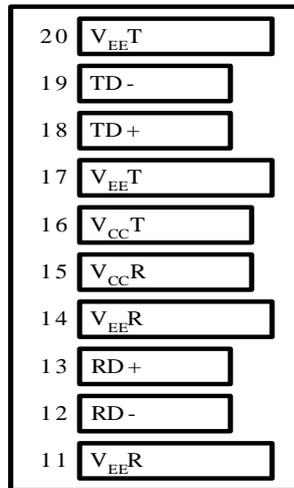
## TIMING CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
TX_DISABLE Assert Time	$t_{off}$			10	$\mu$ s	
TX_DISABLE Negate Time	$t_{on}$			1	ms	
Time to initialize, include reset of TX_FAULT	$t_{init}$			300	ms	
TX_FAULT from fault to assertion	$t_{fault}$			100	$\mu$ s	
TX_DISABLE time to start reset	$t_{reset}$	10			$\mu$ s	
Receiver Loss of Signal Assert Time (off to on)	$t_{A,RX\_LOS}$			100	$\mu$ s	
Receiver Loss of Signal Assert Time (on to off)	$t_{D,RX\_LOS}$			100	$\mu$ s	

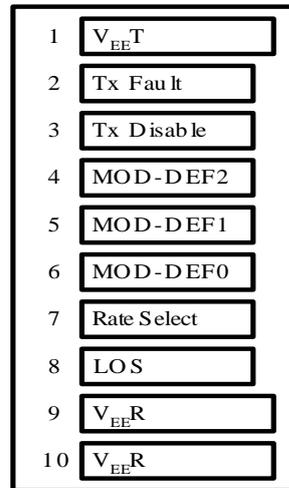
## BLOCK DIAGRAM OF TRANSCEIVER



## PIN OUT DIAGRAM OF TRANSCEIVER



Top of Board



Bottom of Board (As Viewed through Top of Board)

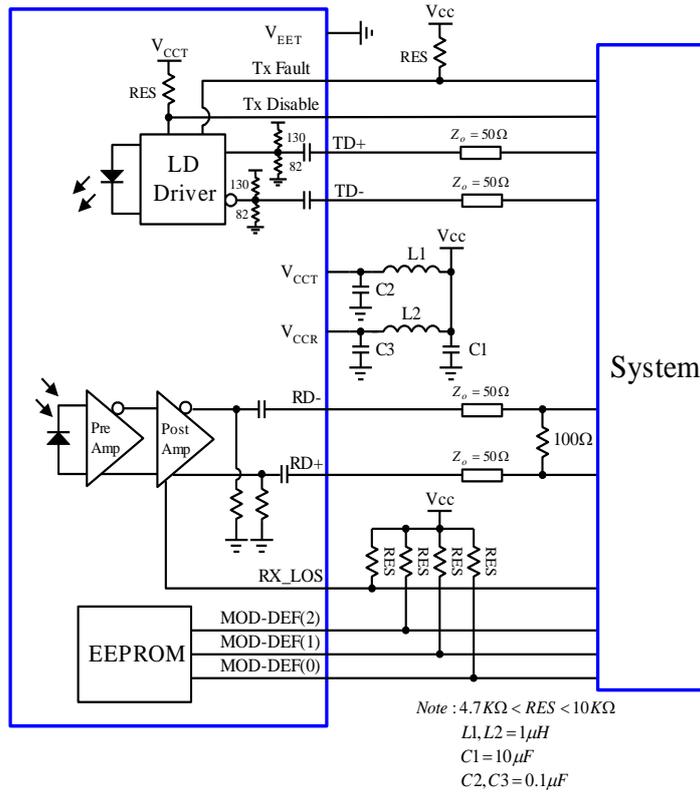
## PIN OUT TABLE

Pin	Symbol	Functional Description
1	VeeT	Transmitter Ground
2	TX Fault	Transmitter Fault Indication
3	TX Disable	Transmitter Disable – Module disables on high or open
4	MOD-DEF(2)	Module Definition 2 – Two wire serial ID interface
5	MOD-DEF(1)	Module Definition 1 – Two wire serial ID interface
6	MOD-DEF(0)	Module Definition 0 – Grounded in module
7	Rate Select	Not Connected
8	LOS	Loss of Signal
9	VeeR	Receiver Ground
10	VeeR	Receiver Ground
11	VeeR	Receiver Ground
12	RD-	Inverse Received Data Out
13	RD+	Received Data Out
14	VeeR	Receiver Ground
15	VccR	Receiver Power
16	VccT	Transmitter Power
17	VeeT	Transmitter Ground
18	TD+	Transmitter Data In
19	TD-	Inverse Transmitter Data In
20	VeeT	Transmitter Ground

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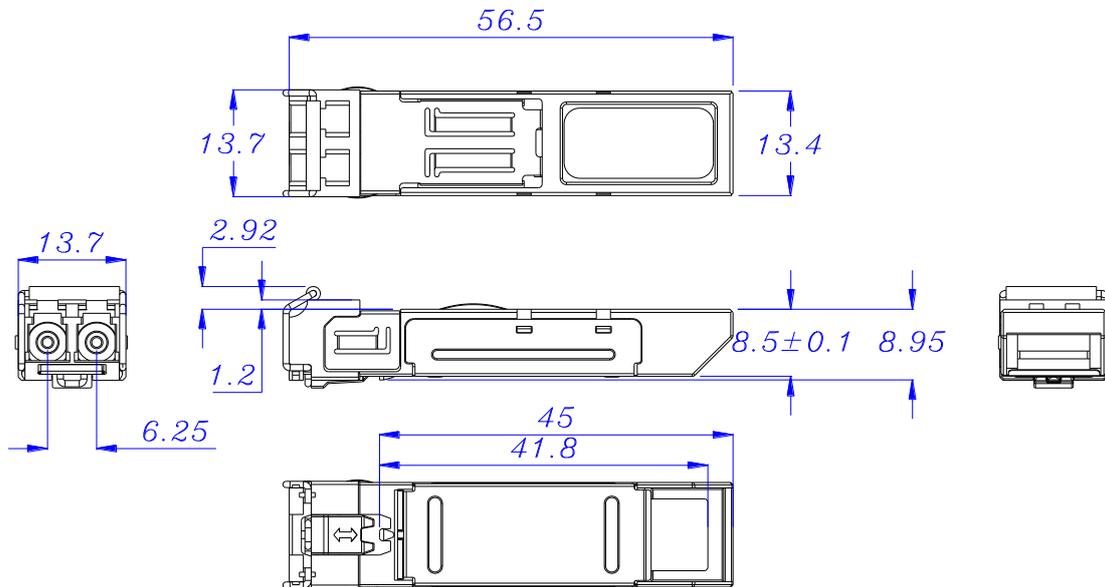


## RECOMMENDED CIRCUIT SCHEMATIC



## MECHANICAL DIMENSIONS

Units in mm



All dimensions are  $\pm 0.2\text{mm}$  unless otherwise specified.

### Claim:

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