

# 155Mbps ATM-Multimode Transceiver



1×9, Duplex SC/ST Connector, 850nm/VCSEL for Multimode Fiber



## Applications

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

## Features

- 850nm VCSEL
- Data Rate: 100Mbps~155Mbps, NRZ
- Single +3.3V or +5V Power Supply
- PECL Differential Electrical Interface
- Industry Standard 1×9 Output Footprint
- Duplex SC/ST Connector
- Compliance with
  - 100Base-FX of IEEE802.3u Standard
  - FDDI PMD Standard
  - ATM Standard
- Eye Safety
  - Designed to meet Laser Class 1 comply with EN60825-1

## Description

The CT-0155NTR-Sx2x series from Coretek Opto Corp. are the high performance and cost-effective modules for serial optical data communication applications specified for multimode of 155 Mb/s. It operates with +5V or +3.3V power supply. The module is intended for multimode fiber, operates at a nominal wavelength of 850nm 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 fast Ethernet applications and to provide an ATM/SONET OC-3/SDH STM-1 compliant link for 155 Mb/s short 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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## Product Information

Model Number	Operating Voltage & SD Output	Connector	Distance	Wavelength	Output Power	Sensitivity
CT-0155NTR-S12C	5V PECL DC/DC	SC	2 km	850 nm	-10 ~ -4 dBm	≤-30 dBm
CT-0155NTR-S22C	3.3V PECL DC/DC					
CT-0155NTR-S12T	5V PECL DC/DC	ST				
CT-0155NTR-S22T	3.3V PECL DC/DC					

## ABSOLUTE MAX RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Storage Temperature	T <sub>S</sub>	-40	85	°C	
Supply Voltage	V <sub>CC</sub>	0	6	V	
Lead Soldering Temperature/Time	T <sub>SOLD</sub>		260	°C	10 sec on lead
Data Input Voltage	---	0	V <sub>CC</sub>	V	

## OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Ambient Operating Temperature	T <sub>A</sub>	0		70	°C	
Supply Voltage (for 3.3V)	V <sub>CC</sub>	3.10		3.50	V	
Supply Voltage (for 5.0V)	V <sub>CC</sub>	4.75		5.25	V	

## ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
<b>Transmitter</b>					
Transmitter Supply Current	I <sub>CC</sub> T		140	mA	
Transmitter Data Input Current – Low	I <sub>IL</sub>	-350		μA	
Transmitter Data Input Current – High	I <sub>IH</sub>		350	μA	
Transmitter Data Input Voltage – Low	V <sub>IL</sub> -V <sub>CC</sub>	-1.84	-1.6	V	1
Transmitter Data Input Voltage – High	V <sub>IH</sub> -V <sub>CC</sub>	-1.1	-0.9	V	1
<b>Receiver</b>					
Receiver Supply Current	I <sub>CC</sub> R		100	mA	
Receiver Data Output Voltage – Low	V <sub>OL</sub> -V <sub>CC</sub>	-1.84	-1.6	V	2
Receiver Data Output Voltage – High	V <sub>OH</sub> -V <sub>CC</sub>	-1.1	-0.9	V	2
Signal Detect Output Voltage – Low	V <sub>OL</sub> -V <sub>CC</sub>	-1.84	-1.6	V	2
Signal Detect Output Voltage – High	V <sub>OH</sub> -V <sub>CC</sub>	-1.1	-0.9	V	2

## TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Optical Output Power (avg.)	P <sub>o</sub>	-10		-4	dBm	3
Extinction Ratio	ER	8.2			dB	
Center Wavelength	λ <sub>c</sub>	830	850	860	nm	
Spectral Width (RMS)	Δλ			1	nm	
Optical Rise time (10%-90%)	t <sub>r</sub>	0.6		3.0	ns p-p	4
Optical Fall time (10%-90%)	t <sub>f</sub>	0.6		3.0	ns p-p	4
Output Eye		Compliant with ITU recommendation G.957				

# 155Mbps ATM-Multimode Transceiver



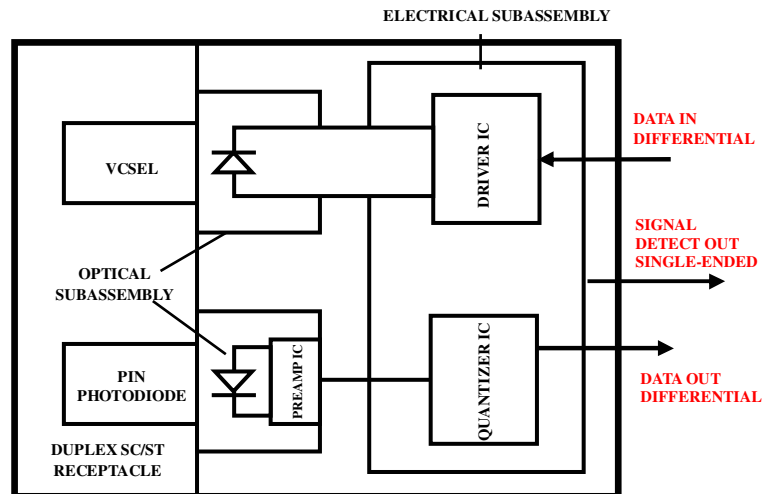
## RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Maximum Input Optical Power	$P_{max}$	-3			dBm	5
Receiver Sensitivity	$P_{min}$			-30	dBm	5
Operating Wavelength	$\lambda$	770		860	nm	
Signal Detect - Asserted	$P_A$			-30	dBm	6
Signal Detect - Deasserted	$P_D$	-45			dBm	7
Signal Detect - Hysteresis	$P_A - P_D$	0.5		4	dB	

### Notes:

1. Compatible with 10K, 10KH, 100K ECL and PECL output signals.
2. These outputs are compatible with 10K, 10KH, 100K ECL and PECL inputs.
3. Measured average power coupled into 62.5/125  $\mu$ m, 0.275 NA graded index multimode fiber.
4. These are 10-90% values.
5. Measured with  $2^{23}-1$  PRBS at BER <  $10^{-10}$
6. Measured on transition – low to high
7. Measured on transition – high to low

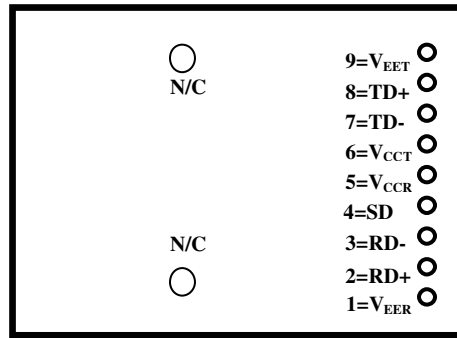
## BLOCK DIAGRAM OF TRANSCEIVER



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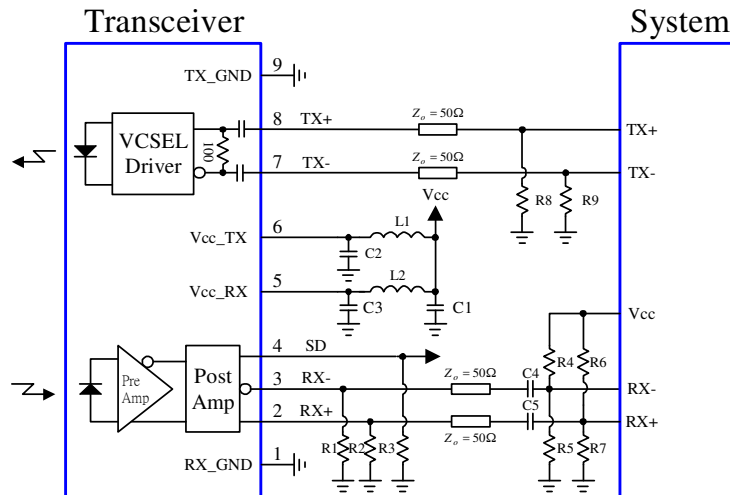


## PIN OUT DIAGRAM OF TRANSCEIVER



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 <sub>EER</sub>	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 <sub>CCR</sub>	Receiver Power Supply
6	V <sub>CCT</sub>	Transmitter Power Supply
7	TD-	Transmitter Data Inverted Differential Input
8	TD+	Transmitter Data Non-inverted Differential Input
9	V <sub>EET</sub>	Transmitter Signal Ground

## RECOMMENDED CIRCUIT SCHEMATIC



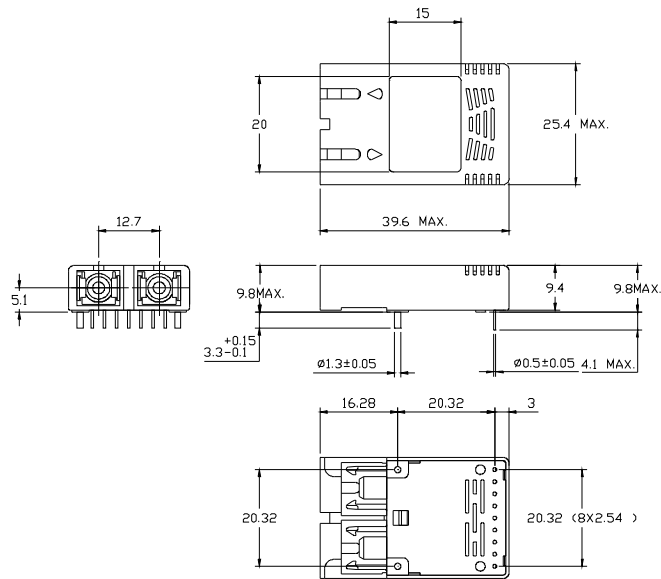
$C1 = 4.7 \mu F$        $L1/L2 = 1 \mu H$        $C2/C3/C4/C5 = 0.1 \mu F$   
 $R1/R2 = 150 \Omega$  (3.3V)       $R3 = 270 \Omega$  (3.3V)  
 $R1/R2 = 300 \Omega$  (5V)       $R3 = 510 \Omega$  (5V)  
 $R4, R5, R6, R7, R8, R9$  depend on System chip

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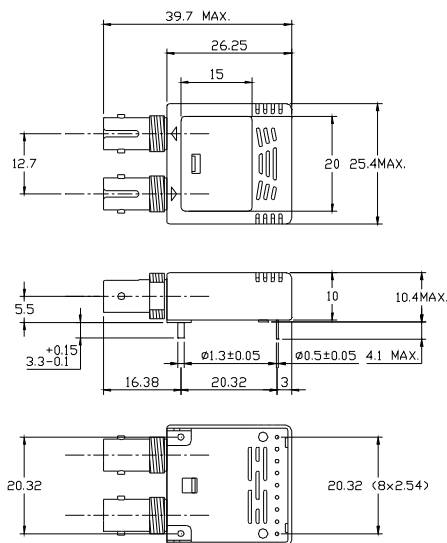
## MECHANICAL DIMENSIONS

Units in mm



DIMENSIONS ARE IN MILLIMETERS.  
ALL DIMENSIONS ARE  $\pm 0.1$ mm UNLESS OTHERWISE SPECIFIED.

### SC Connector Type



DIMENSIONS ARE IN MILLIMETERS.  
ALL DIMENSIONS ARE  $\pm 0.1$ mm UNLESS OTHERWISE SPECIFIED.

### ST Connector Type

#### Claim:

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