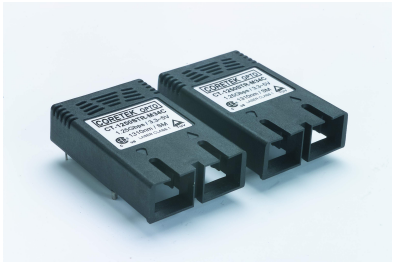
# 155Mbps ATM-Multimode Transceiver

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

*Extended Operating Temperature from –40 to +85℃*





### 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 Power Supply
- PECL Differential Electrical Interface
- Industry Standard 1×9 Output Footprint
- Duplex SC/Metal 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-S22x-A from Coretek Opto Corp. is a high performance and cost-effective module 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 | Connector | Operating Voltage & SD Output | Distance | Wavelength | Output Power | Sensitivity |
|---|---|---|---|---|---|---|
| *CT-0155NTR-S22C-A* | *SC* | *3.3V PECL DC/DC* | *2 km* | *850 nm* | *-10 ~ -4 dBm* | *≦-30 dBm* |
| *CT-0155NTR-S22T-A* | *ST* | | | | | |

## 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 | |

## 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 | 1 |
| Transmitter Data Input Voltage – High | $V_{IH}$-$V_{CC}$ | -1.1 | -0.9 | V | 1 |
| **Receiver** | | | | | |
| Receiver Supply Current | $I_{CCR}$ | | 100 | mA | |
| Receiver Data Output Voltage – Low | $V_{OL}$-$V_{CC}$ | -1.84 | -1.6 | V | 2 |
| Receiver Data Output Voltage – High | $V_{OH}$-$V_{CC}$ | -1.1 | -0.9 | V | 2 |
| Signal Detect Output Voltage – Low (for PECL) | $V_{OL}$-$V_{CC}$ | -1.84 | -1.6 | V | 2 |
| Signal Detect Output Voltage – High (for PECL) | $V_{OH}$-$V_{CC}$ | -1.1 | -0.9 | V | 2 |

## TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

| PARAMETER | SYMBOL | MIN | TYP. | MAX | UNIT | NOTE |
|---|---|---|---|---|---|---|
| Optical Output Power (avg.) | Po | -10 | | -4 | dBm | 3 |
| Extinction Ratio | ER | 8.2 | | | dB | |
| Center Wavelength | $\lambda_c$ | 830 | 850 | 860 | nm | |
| Spectral Width (RMS) | $\Delta\lambda$ | | | 1 | nm | |
| Optical Rise time (10%-90% ) | $t_r$ | 0.6 | | 3.0 | ns p-p | 4 |
| Optical Fall time (10%-90% ) | $t_f$ | 0.6 | | 3.0 | ns p-p | 4 |
| Output Eye | Compliant with ITU recommendation G.957 | | | | | |



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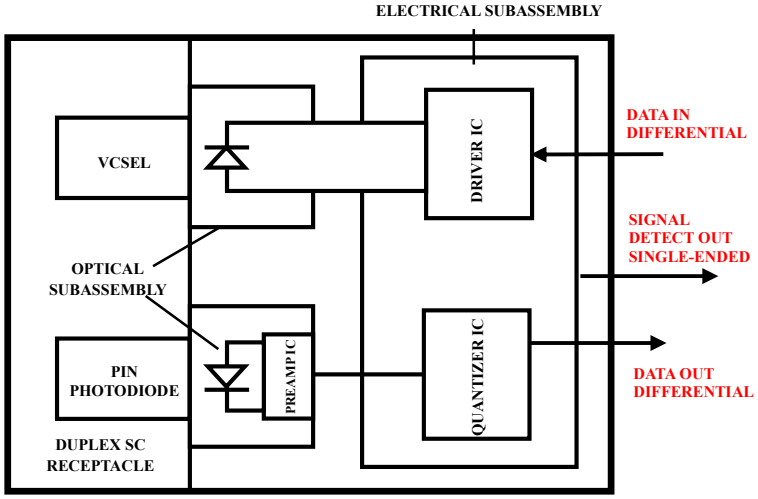
## RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

| 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 | $P_D$ | -47 | | | 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

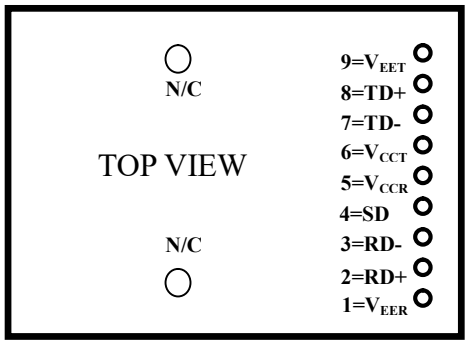
## *BLOCK DIAGRAM OF TRANSCEIVER*





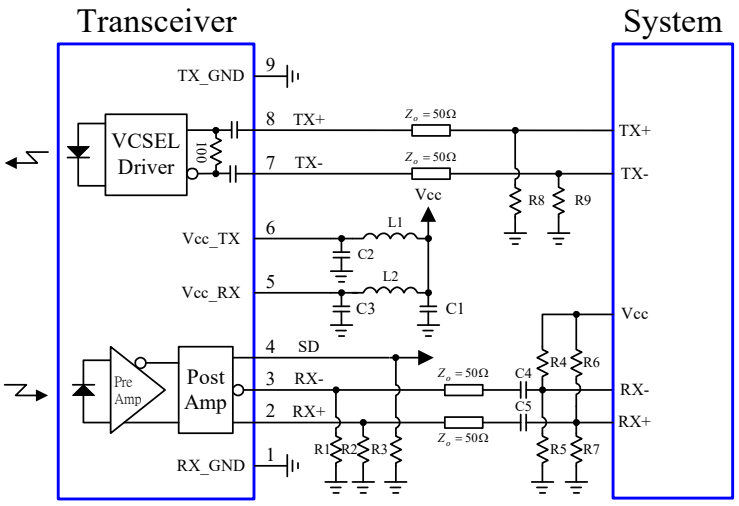

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## PIN OUT DIAGRAM OF TRANSCEIVER




| 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 | $V_{EER}$ | 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 |

## RECOMMENDED CIRCUIT SCHEMATIC



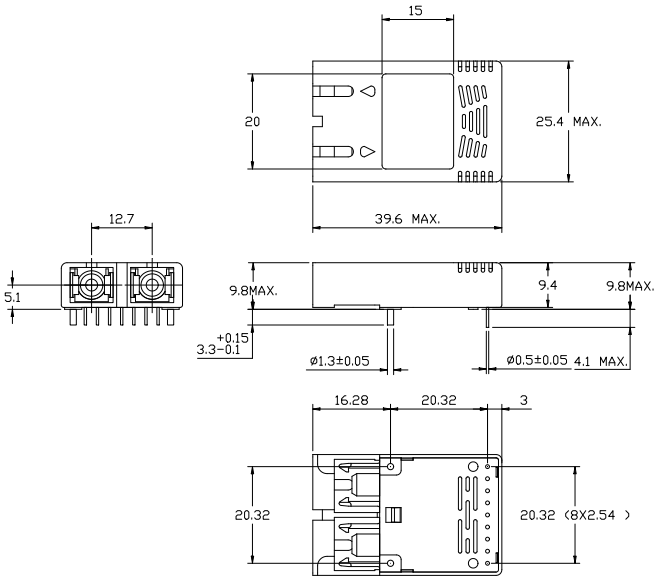

C1 = 4.7 μF  L1/L2 = 1 μH  C2/C3/C4/C5=0.1 μF
R1/R2=150Ω (3.3V)  R3=270Ω (3.3V)
R1/R2=300Ω (5V)  R3=510Ω (5V)
R4,R5,R6,R7,R8,R9 depend on System chip



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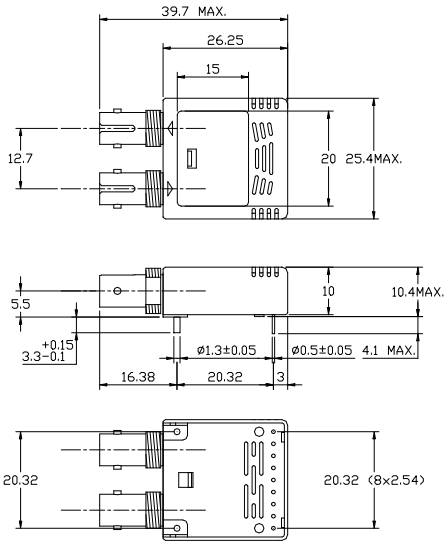
## MECHANICAL DIMENSIONS

**Units in mm**




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

### SC Connector Type




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

### ST Connector Type

***Claim***:

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



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