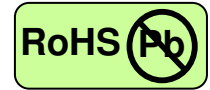


155Mbps ATM-Single Mode Transceiver



1×9, Duplex SC/ST/FC Connector, 1310nm FP LD for Single Mode Fiber
Extended Operating Temperature from -40 to +85 °C, RoHS Compliant



Applications

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

Features

- 1310nm FP LD
- Data Rate: 100Mbps~155Mbps, NRZ
- Single +3.3V or +5V Power Supply
- RoHS Compliant and Lead-free
- PECL Differential Electrical Interface/PECL Compatible Logic Interface
- PECL or TTL Signal Detect Output
- Industry Standard 1×9 Output Footprint
- Duplex SC/ST/FC 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-0155TTR-Mx7x-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 155 Mb/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 fast Ethernet applications and 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

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 | LD Type & Wavelength | Output Power | Sensitivity |
|-------------------|-------------------------------|-----------|----------|----------------------|--------------|-------------|
| CT-0155TTR-M17C-A | 5V PECL DC/DC | SC | | | | |
| CT-0155TTR-M27C-A | 3.3V PECL DC/DC | | | | | |
| CT-0155TTR-MA7C-A | 5V TTL DC/DC | | | | | |
| CT-0155TTR-ME7C-A | 3.3V TTL DC/DC | | | | | |
| CT-0155TTR-M17T-A | 5V PECL DC/DC | ST | 60 km | 1310 nm FP | -3 ~ +2 dBm | ≤ -36 dBm |
| CT-0155TTR-M27T-A | 3.3V PECL DC/DC | | | | | |
| CT-0155TTR-MA7T-A | 5V TTL DC/DC | | | | | |
| CT-0155TTR-ME7T-A | 3.3V TTL DC/DC | | | | | |
| CT-0155TTR-M17F-A | 5V PECL DC/DC | FC | | | | |
| CT-0155TTR-M27F-A | 3.3V PECL DC/DC | | | | | |
| CT-0155TTR-MA7F-A | 5V TTL DC/DC | | | | | |
| CT-0155TTR-ME7F-A | 3.3V TTL DC/DC | | | | | |

ABSOLUTE MAX RATINGS

| PARAMETER | SYMBOL | MIN | MAX | UNIT | NOTE |
|---------------------------------|-------------------|-----|-----------------|------|----------------|
| Storage Temperature | T _S | -40 | 85 | °C | |
| Supply Voltage | V _{CC} | 0 | 6 | V | |
| Lead Soldering Temperature/Time | T _{SOLD} | | 260 | °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 | -40 | | 85 | °C | |
| Supply Voltage (for 3.3V) | V _{CC} | 3.10 | | 3.50 | V | |
| Supply Voltage (for 5.0V) | V _{CC} | 4.75 | | 5.25 | V | |

ELECTRICAL CHARACTERISTICS

| PARAMETER | SYMBOL | MIN | MAX | UNIT | NOTE |
|--|----------------------------------|--------|--------|------|------|
| Transmitter | | | | | |
| Transmitter Supply Current | I _{CC1} | | 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} | -1.810 | -1.620 | V | 1 |
| Transmitter Data Input Voltage – High | V _{IH} -V _{CC} | -1.025 | -0.880 | V | 1 |
| Receiver | | | | | |
| Receiver Supply Current | I _{CC2} | | 100 | mA | |
| Receiver Data Output Voltage – Low | V _{OL} -V _{CC} | -1.810 | -1.620 | V | 2 |
| Receiver Data Output Voltage – High | V _{OH} -V _{CC} | -1.025 | -0.880 | V | 2 |
| Signal Detect Output Voltage – Low (for PECL) | V _{OL} -V _{CC} | -1.810 | -1.620 | V | 2 |
| Signal Detect Output Voltage – High (for PECL) | V _{OH} -V _{CC} | -1.025 | -0.880 | V | 2 |
| Signal Detect Output Voltage – Low (for TTL) | V _{OL} | | 0.4 | V | 2 |
| Signal Detect Output Voltage – High (for TTL) | V _{OH} | 2.4 | | V | 2 |

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TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

| PARAMETER | SYMBOL | MIN | TYP. | MAX | UNIT | NOTE |
|-----------------------------|--|------|------|------|--------|------|
| Optical Output Power (avg.) | P _o | -3 | | 2 | dBm | 3 |
| Extinction Ratio | ER | 10 | | | dB | 4, 5 |
| Center Wavelength | λ_c | 1263 | 1310 | 1360 | nm | |
| Spectral Width (RMS) | $\Delta \lambda$ | | | 3 | nm | |
| Optical Rise time (10%-90%) | t _r | | | 2.0 | ns p-p | 4 |
| Optical Fall time (10%-90%) | t _f | | | 2.0 | ns p-p | 4 |
| Output Eye | Compliant with Bellcore TR-NWT-000253 and ITU recommendation G.957 | | | | | |

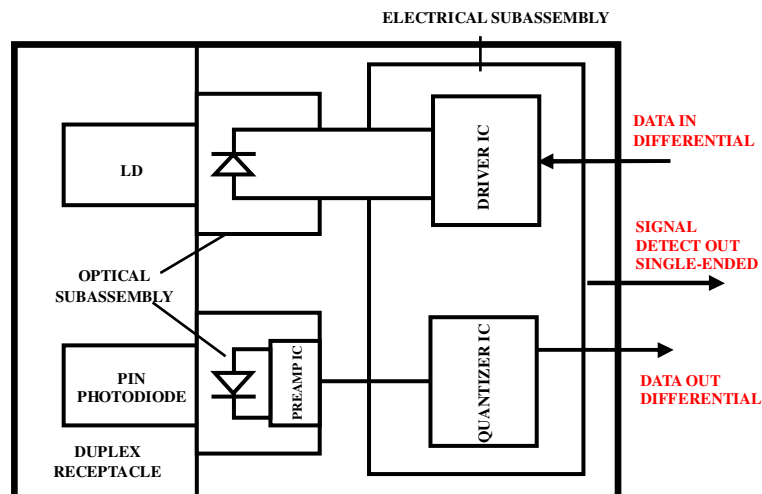
RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

| PARAMETER | SYMBOL | MIN | TYP. | MAX | UNIT | NOTE |
|-----------------------------|---------------------------------|---------------------|------|------|------|------|
| Maximum Input Optical Power | P _{max} | -3 | | | dBm | 5 |
| Receiver Sensitivity | P _{min} | | | -36 | dBm | 5 |
| Operating Wavelength | λ | 1100 | | 1600 | nm | |
| Signal Detect - Asserted | P _A | P _D +0.5 | | -36 | 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 9/125 μ m single mode fiber.
4. The input data pattern is a 12.5MHz square wave pattern.
5. Measured with 2²³-1 PRBS at BER<10⁻¹⁰
6. Measured on transition – low to high
7. Measured on transition – high to low

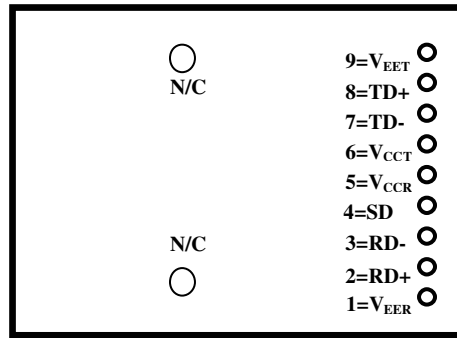
BLOCK DIAGRAM OF TRANSCEIVER



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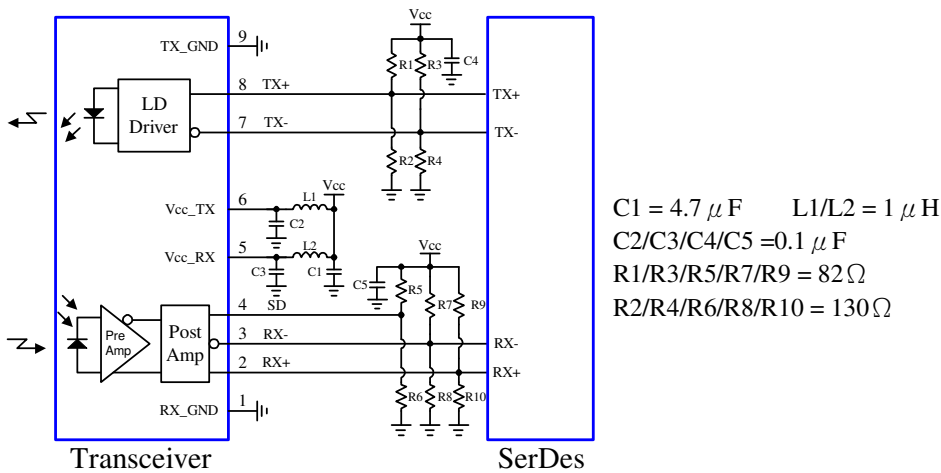
PIN OUT DIAGRAM OF TRANSCEIVER



| 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 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

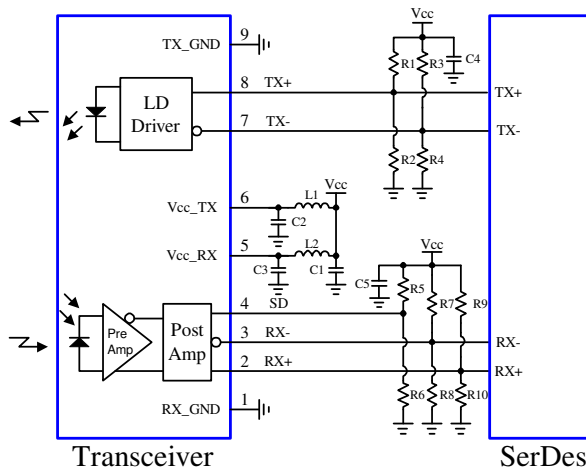
1) 5V SD PECL DC/DC Module



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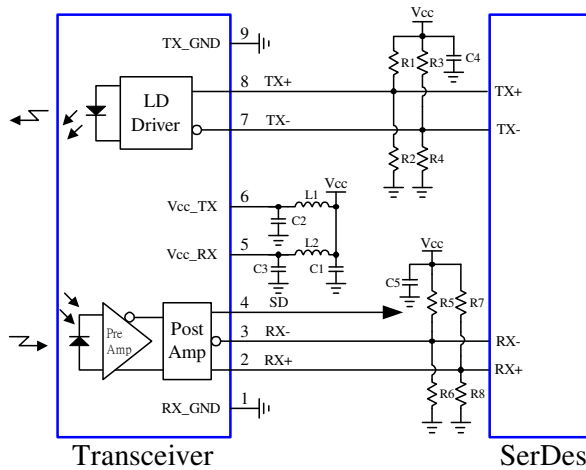


2) 3.3V SD PECL DC/DC Module



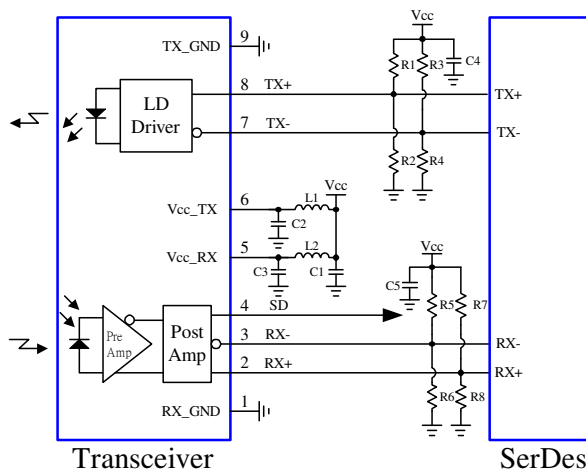
$C1 = 4.7 \mu F$ $L1/L2 = 1 \mu H$
 $C2/C3/C4/C5 = 0.1 \mu F$
 $R1/R3/R5/R7/R9 = 130 \Omega$
 $R2/R4/R6/R8/R10 = 82 \Omega$

3) 5V SD TTL DC/DC Module



$C1 = 4.7 \mu F$ $L1/L2 = 1 \mu H$
 $C2/C3/C4/C5 = 0.1 \mu F$
 $R1/R3/R5/R7 = 82 \Omega$
 $R2/R4/R6/R8 = 130 \Omega$

4) 3.3V SD TTL DC/DC Module



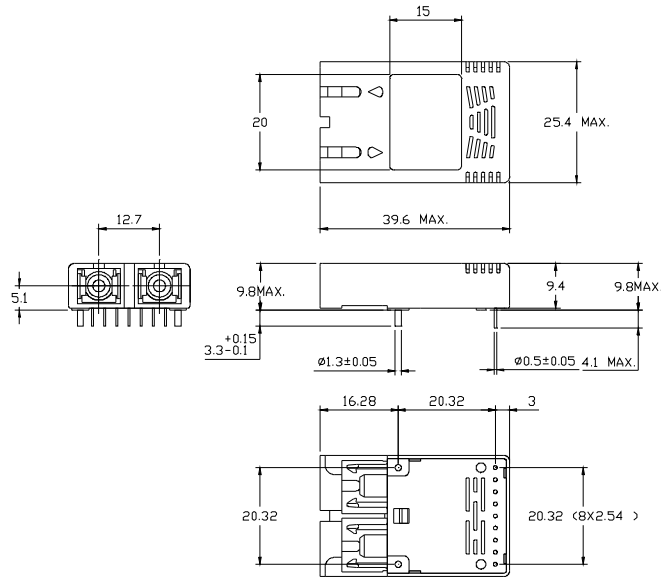
$C1 = 4.7 \mu F$ $L1/L2 = 1 \mu H$
 $C2/C3/C4/C5 = 0.1 \mu F$
 $R1/R3/R5/R7 = 130 \Omega$
 $R2/R4/R6/R8 = 82 \Omega$

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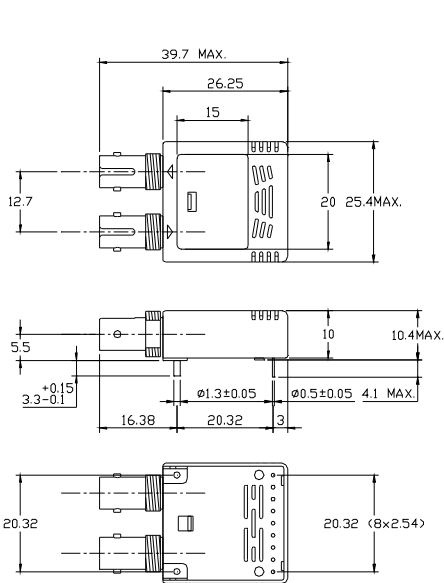
MECHANICAL DIMENSIONS

Units in mm



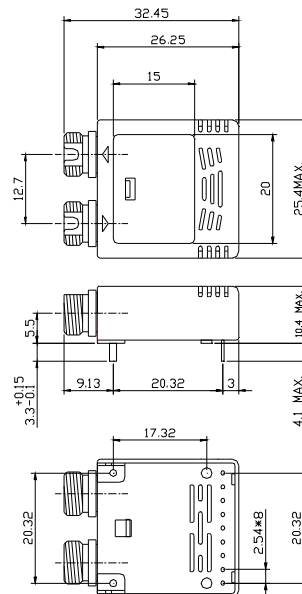
DIMENSIONS ARE IN MILLIMETERS.
ALL DIMENSIONS ARE ± 0.1 mm UNLESS OTHERWISE SPECIFIED.

SC Connector Type



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

ST Connector Type



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

FC Connector Type

Claim:

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