

B-15/13-155S-TPM3-SSC4-54



Features

- Coaxial single mode single fiber package with optional SC connector
- Wavelength Tx 1530nm/ Rx 1310nm
- SONET OC-3 SDH STM-1(S-1.1) Compliant
- Single +3.3V Power Supply
- LVPECL Differential Inputs and Outputs
- Wave Solderable and Aqueous washable
- LED Multisourced 1x9 Transceiver Interchangeable
- Class 1 Laser Int. Safety Standad IEC 825 Compliant
- Uncooled laser diode with MQW structure
- Complies with Telcordia (Bellcore) GR-468-CORE
- Temperature Range: 0 to 70°C
- Cross Talk < -33 dB
- Optical Return Loss > 14dB
- Rx Data output squelch function
- RoHS compliance available

Absolute Maximum Rating

| Parameter | Symbol | Min. | Max. | Unit | Note |
|-----------------------|------------------|------|------|------|--------------------------|
| Power Supply Voltage | V _{cc} | 0 | 3.6 | V | |
| Output Current | I _{out} | 0 | 30 | mA | |
| Soldering Temperature | - | - | 260 | °C | 10 seconds on leads only |
| Operating Temperature | T _{opr} | 0 | 70 | °C | |
| Storage Temperature | T _{stg} | -40 | 85 | °C | |

Recommended Operating Condition

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|------------------------------|------------------|------|------|------|------|
| Power Supply Voltage | V _{cc} | 3.1 | 3.3 | 3.5 | V |
| Operating Temperature (Case) | T _{opr} | 0 | - | 70 | °C |
| Data Rate | - | - | 155 | - | Mbps |

Transmitter Specifications

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|--------------------------|--|------|---------|------|-------|--|
| Optical | | | | | | |
| Optical Transmit Power | P _o | -8 | - | -3 | dBm | Output power is coupled into a 9/125 μm single mode fiber |
| Output center Wavelength | λ | 1500 | 1530 | 1600 | nm | |
| Output Spectrum Width | Δλ | - | - | 3 | nm | RMS (σ) |
| Extinction Ratio | ER | 8.5 | - | - | dB | |
| Output Eye | Compliant with Bellcore GR-253-CORE and ITU recommendation G.957 | | | | | |
| Optical Rise Time | t _r | - | - | 2 | ns | 10% to 90% Values |
| Optical Fall Time | t _f | - | - | 2 | ns | 10% to 90% Values |
| Optical Isolation | - | 30 | - | - | dB | Tx:1310 nm/ Rx:1530nm |
| Optical Return Loss | - | 14 | - | - | dB | |
| Relative Intensity Noise | RIN | - | - | -116 | dB/Hz | |
| Total Jitter | TJ | - | - | 1.2 | ns | Measured with 2 ²³ -1 PRBS with 72 ones and 72 zeros. |

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Transmitter Specifications

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|----------------------------|-----------------|------|---------|-------|---------|---|
| Electrical | | | | | | |
| Power Supply Current | I_{CC} | - | - | 180 | mA | Maximum current is specified at V_{CC} =Maximum @ maximum temperature |
| Data Input Current-Low | I_{IL} | -350 | - | - | μ A | |
| Data Input Current-High | I_{IH} | - | - | 350 | μ A | |
| Differential Input Voltage | $V_{IH}-V_{IL}$ | 300 | - | - | mV | |
| Data Input Voltage-Low | $V_{IL}-V_{CC}$ | -2.0 | - | -1.58 | V | These inputs are compatible with 10K, 10KH and 100K ECL and PECL inputs |
| Data Input Voltage-High | $V_{IH}-V_{CC}$ | -1.1 | - | -0.74 | V | |

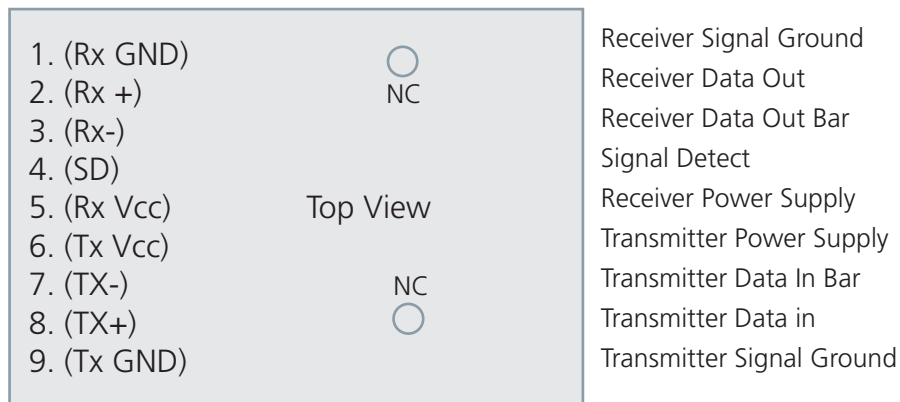
Receiver Specifications

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|--------------------------|----------|------|---------|------|------|---|
| Optical | | | | | | |
| Sensitivity | - | - | - | -33 | dBm | Measured with 2 ²³ -1 PRBS with 72 ones and 72 zeros.t |
| Maximum Input Power | P_{in} | -3 | - | - | dBm | |
| Signal Detect-Asserted | P_a | - | - | -33 | dBm | Measured on transition: low to high |
| Signal Detect-Deasserted | P_d | -45 | - | - | dBm | Measured on transition: high to low |
| Signal Detect-Hysteresis | | 1.0 | - | 4.0 | dB | |
| Cross Talk | - | - | - | -33 | dB | |
| Wavelength of Operation | | 1260 | - | 1360 | nm | |

Receiver Specifications

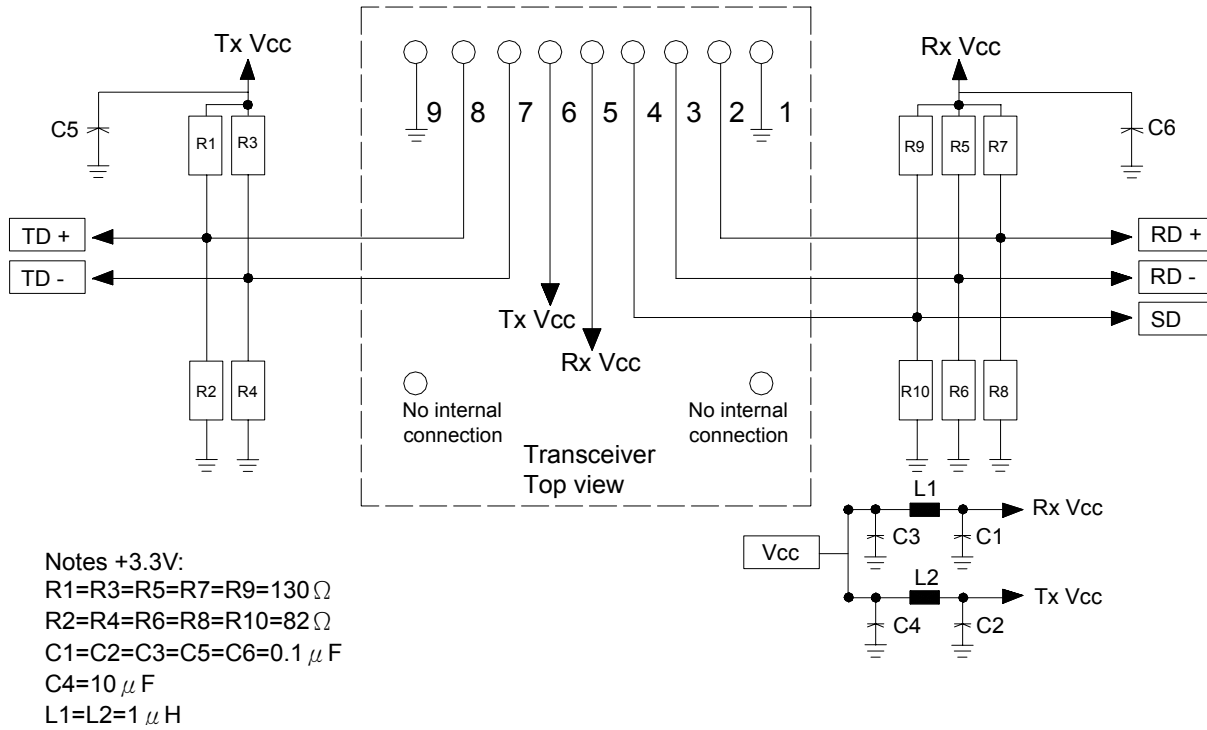
| Parameter | Symbol | Min | Typical | Max | Unit | Note |
|-----------------------------------|------------------|------|---------|-------|------|--|
| Electrical | | | | | | |
| Power Supply Current | I_{CC} | - | - | 100 | mA | The current excludes the output load current |
| Data Output Voltage-Low | $V_{OL}-V_{CC}$ | -2 | - | -1.58 | V | These outputs are compatible with 10K, 10KH and 100KECL and PECL outputs |
| Data Output Voltage-High | $V_{OH}-V_{CC}$ | -1.1 | - | -0.74 | V | |
| Signal Detect Output Voltage-Low | $V_{SDL}-V_{CC}$ | -2 | - | -1.58 | V | |
| Signal Detect Output Voltage-High | $V_{SDH}-V_{CC}$ | -1.1 | - | -0.74 | V | |

Connection Diagram



| PIN | Symbol | Notes |
|-----|--------|---|
| 1 | RxGND | Directly connect this pin to the receiver ground plane |
| 2 | RD+ | See recommended circuit schematic |
| 3 | RD- | See recommended circuit schematic |
| 4 | SD | Active high on this indicates a received optical signal |
| 5 | RxVcc | +3.3V dc power for the receiver section |
| 6 | TxVcc | +3.3 V dc power for the transmitter section |
| 7 | TD- | See recommended circuit schematic |
| 8 | TD+ | See recommended circuit schematic |
| 9 | TxGND | Directly connect this pin to the transmitter ground plane |

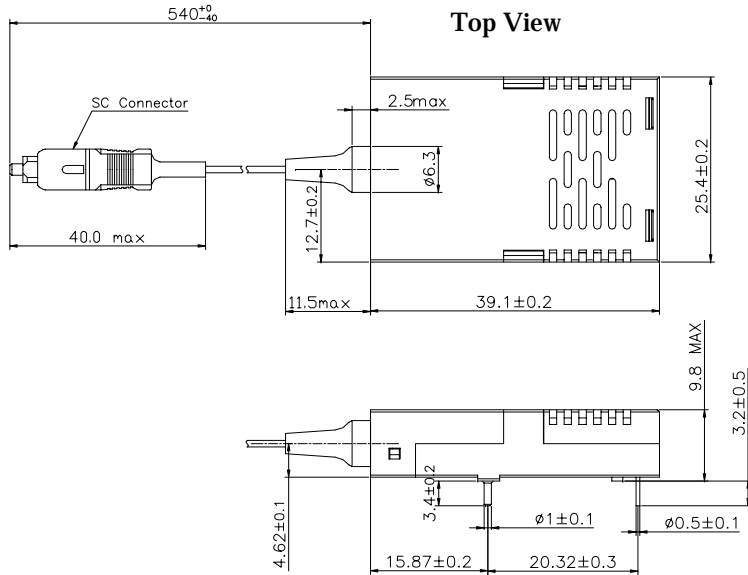
Recommended Circuit Schematic



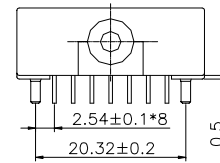
The split-loaded terminations for ECL signals need to be located at the input of devices receiving those ECL signals.
 The power supply filtering is required for good EMI performance. Use short tracks from the inductor L1/L2 to the module Rx Vcc.
 A GND plane under the module is required for good EMI and sensitivity performance.

Package Diagram

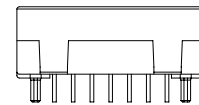
Units: mm (inches)



Front View



Rear View



Ordering Information

Available Options:

- B-15/13-155S-TPM3-SSC4-54
- B-15/13-155S-TPM3-SSC4-54-G5
- B-15/13-155S-TPM3-SSC4-54-GR

Part numbering Definition:

B - 15/13 - 155S - TPM3 - S SC Tx Power pigtail length RoHS compliance available

- Wavelength _____
Tx Wavelength = 1550nm
Rx Wavelength = 1310nm
- Communication protocol _____
(155 Mbps, Squelch function)
- +3.3V Pigtail Transceiver _____
- Single mode fiber _____
- Connector options _____
- Tx power _____
4 = -8 to -3 dBm
- pigtail length _____
-54 = 540 mm +0 / -40 mm
- RoHS compliance available _____
Blank = RoHS non-compliant product
G5 = RoHS 5/6-compliant product (lead exemption)
GR = Full RoHS compliant product (no exemption)

Warnings:

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

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