

## B-13/15-155(C)-T(3)-Sxx5(7)



## Features

- Diplexer Single Mode Single Fiber 1x9 SC/SF/ST Receptacle Connector
- Wavelength Tx 1310nm/Rx 1530 nm
- SONET OC-3 SDH STM-1 Compliant
- Single +5V Power Supply [B-13/15-155-T-Sxx5(7)]
- Single +3.3V Power Supply [B-13/15-155-T3-Sxx5(7)]
- PECL/LVPECL Differential Inputs and Outputs [B-13/15-155-T(3)-Sxx5(7)]
- TTL/LVTTL Differential Inputs and Outputs [B-13/15-155C-T(3)-Sxx5(7)]
- Wave Solderable and Aqueous Washable
- LED Multisourced 1x9 transceiver interchangeable
- Class 1 Laser Int. Safety Standard IEC 825 Compliant
- Uncooled Laser diode with MQW structure
- Complies with Telcordia(Bellcore) GR-468-CORE
- RoHS compliance available

## Absolute Maximum Rating

Parameter	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	$V_{CC}$	0	6	V	B-13/15-155-T-Sxx5(7)
Power Supply Voltage	$V_{CC}$	0	3.6	V	B-13/15-155-T3-Sxx5(7)
Output Current	$I_{out}$	-	30	mA	
Soldering Temperature	-	-	260	°C	10 seconds on leads only
Storage Temperature	$T_{stg}$	-40	85	°C	

## Recommended Operating Condition

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	$V_{CC}$	4.75	5	5.25	V
Power Supply Voltage	$V_{CC}$	3.1	3.3	3.5	V
Operating Temperature (Case)	$T_{opr}$	0	-	70	°C
Operating Temperature (Case)	$T_{opr}$	0	-	70	°C
Data Rate	-	-	155	-	Mbps

## Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Optical</b>						
Optical Transmit Power	$P_o$	-5	-	0	dBm	Output power is coupled into a 9/125 $\mu$ m single mode fiber (B-13/15-155-T(3)-Sxx5)
Optical Transmit Power	$P_o$	-3	-	+2	dBm	Output power is coupled into a 9/125 $\mu$ m single mode fiber (B-13/15-155-T(3)-Sxx7)
Output center Wavelength	$\lambda$	1260	1310	1360	nm	
Output Spectrum Width	$\Delta\lambda$	-	-	3	nm	RMS ( $\sigma$ )
Extinction Ratio	ER	10	-	-	dB	
Output Eye	Compliant with ITU-T recommendation G.957/STM-1					
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	Isolation potential between 1480-1580nm at least 30dB
Relative Intensity Noise	RIN	-	-	-116	dB/Hz	
Total Jitter	TJ	-	-	1.2	ns	Measured with 2 <sup>23</sup> -1 PRBS with 72 ones and 72 zeros.

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## Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Electrical</b>						
Power Supply Current	$I_{CC}$	-	-	200	mA	Maximum current is specified at $V_{CC}$ = Maximum @ maximum temperature
Data Input Current-Low	$I_{IL}$	-350	-	-	$\mu$ A	
Data Input Current-High	$I_{IH}$	-	-	350	$\mu$ 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

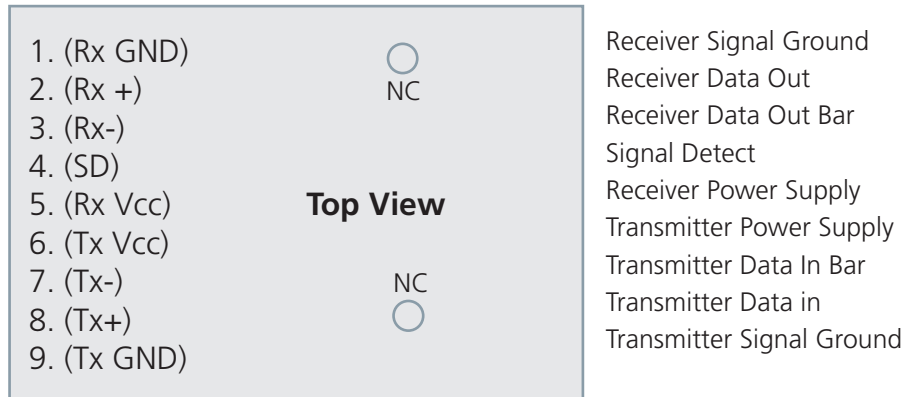
Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Optical</b>						
Sensitivity	-	-	-	-33	dBm	Measured with 2 <sup>23</sup> -1 PRBS, BER = 10 <sup>-10</sup> , B-13/15-155-T(3)-SSC5
Sensitivity	-	-	-	-35	dBm	Measured with 2 <sup>23</sup> -1 PRBS, BER = 10 <sup>-10</sup> , B-13/15-155-T(3)-SSC7
Maximum Input Power	$P_{in}$	-3	-	-	dBm	
Signal Detect-Asserted (Note 1)	$P_a$	-	-	-33	dBm	MEasured on transition : low to high B-13/15-155-T(3)-SSC5
Signal Detect-Asserted (Note 1)	$P_a$	-	-	-35	dBm	MEasured on transition : low to high B-13/15-155-T(3)-SSC7
Signal Detect-Deasserted (Note 1)	$P_d$	-45	-	-	dBm	Measured on transition: high to low B-13/15-155-T(3)-SSC5
Signal Detect-Hysteresis		1.0	-	4.0	dB	
Wavelength of Operation		1480	-	1600	nm	

Note 1: Regardless of whether the Tx is on or not, SD should be asserted at less than -33 or -35 dBm of input power level and deasserted at higher than -45 dBm of input power level from the outside Tx.

## Receiver Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Note
<b>Electrical</b>						
Power Supply Current	$I_{CC}$	-	-	100	mA	The current excludes the output load current
Data Output Voltage-Low	$V_{OL}-V_{CC}$	-2.0	-	-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	$V_{SDL}-V_{CC}$	-2.0	-	-1.58	V	
Signal Detect Output Voltage-High	$V_{SDH}-V_{CC}$	-1.1	-	-0.74	V	

### Connection Diagram

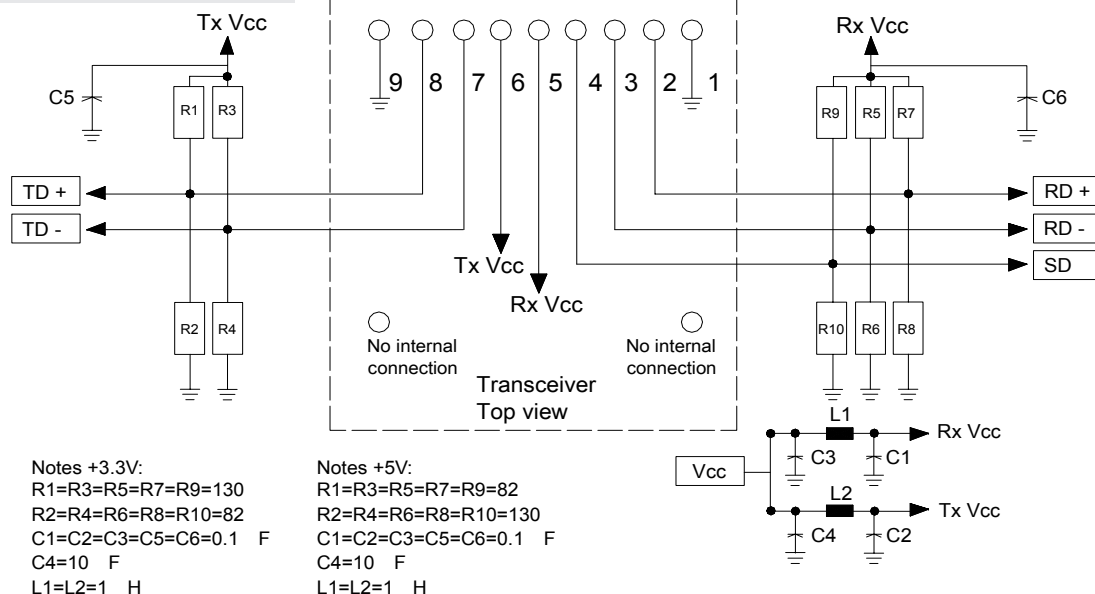


PIN	Symbol	Notes
1	RxGND	Directly connect this pin to the receiver ground plane
2	RD+	See recommended circuit schematic
3	RD-	See recommended circuit schematic
4	SD	Active high on this indicates a received optical signal
5	RxVcc	DC power for the receiver section
6	TxVcc	DC power for the transmitter section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

## B-13/15-155(C)-T(3)-Sxx5(7)

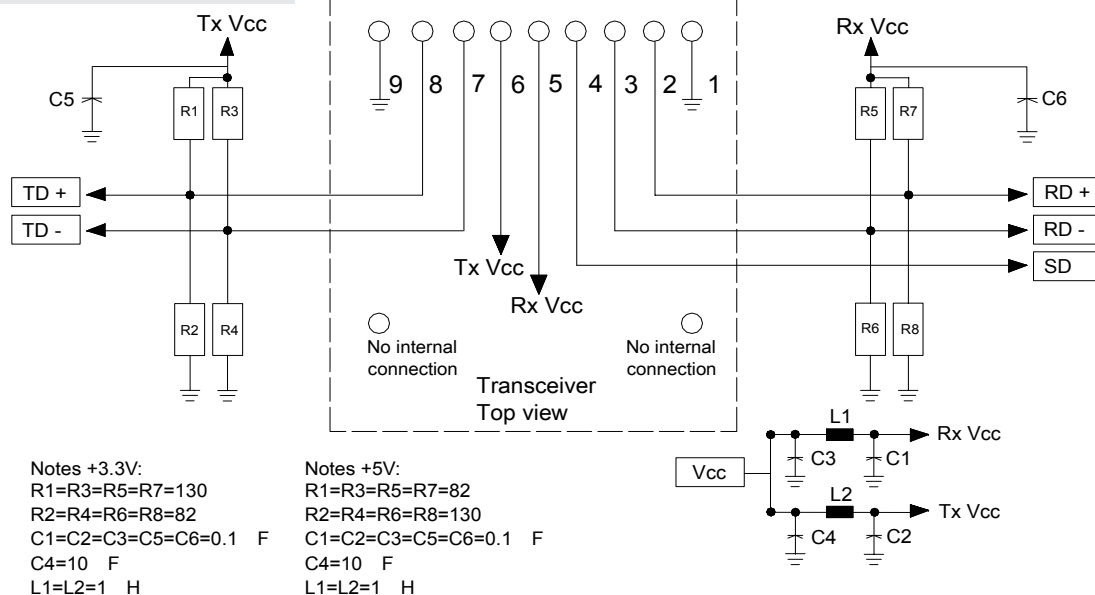
### Recommended Circuit Schematic (3.3V/5V)

#### B-13/15-155-T(3)-Sxx5(7)



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#### B-13/15-155C-T(3)-Sxx5(7)

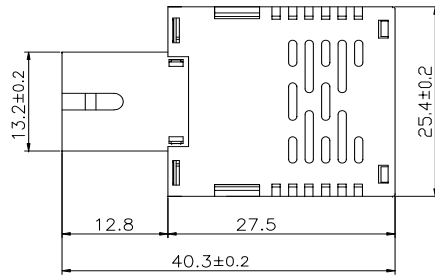


The split-loaded terminations for ECL signals need to be located at the input of devices receiving those ECL signals. The power supply filtering is required for good EMI performance. Use short tracks from the inductor L1/L2 to the module Rx Vcc. A GND plane under the module is required for good EMI and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

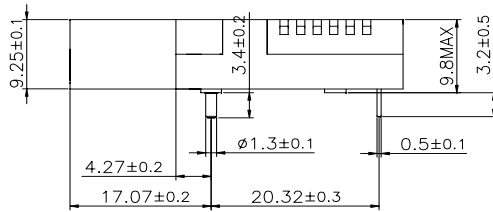
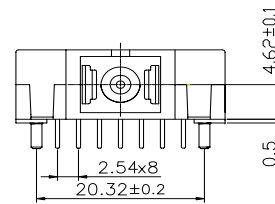
Package Diagram

**B-13/15-155-T(3)-SSC5(7)**

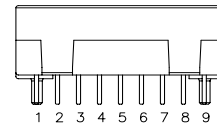
**Top View**



**Front View**



**Side View**



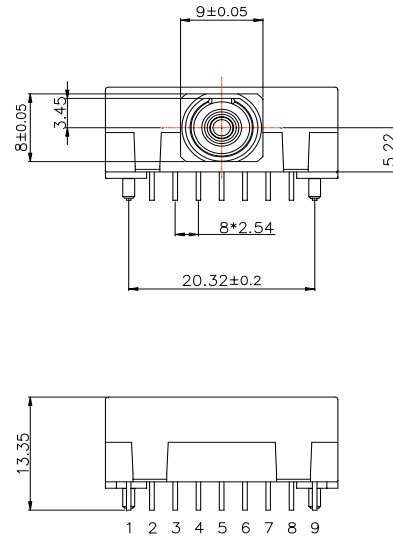
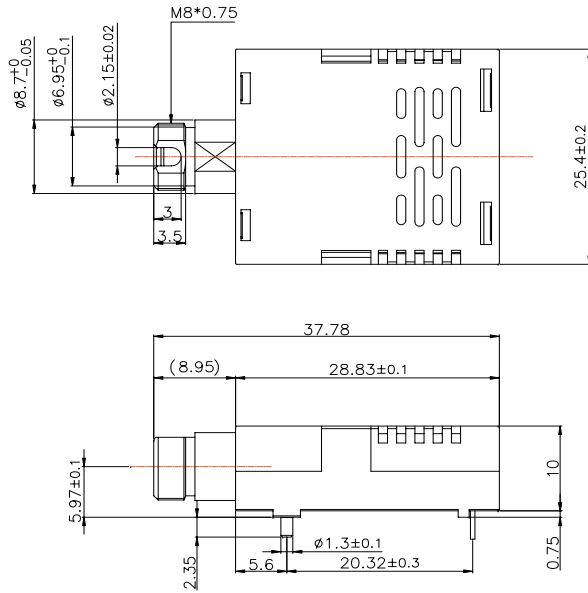
**Rear View**

Package Diagram

**B-13/15-155-T(3)-SFC5(7)**

Top View

Front View

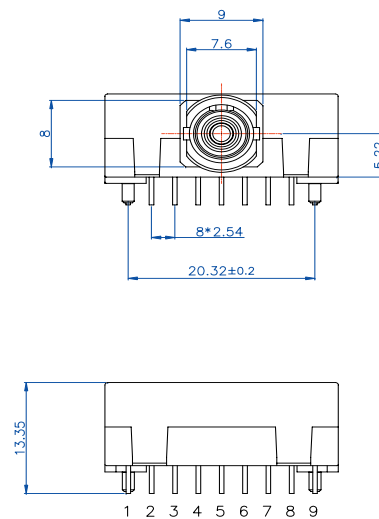
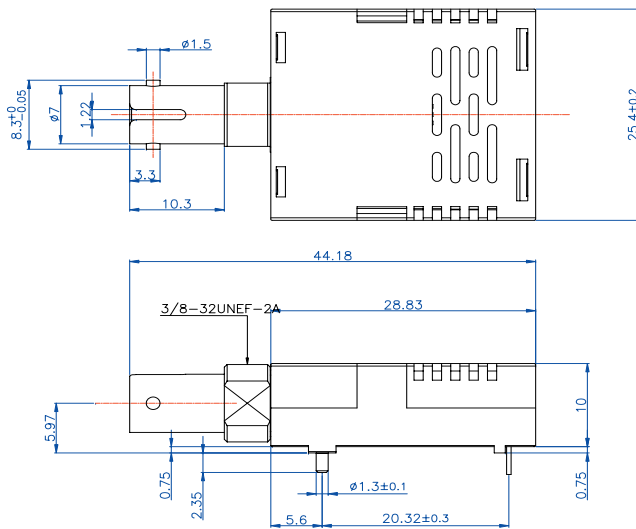


Package Diagram

**B-13/15-155-T(3)-SST5(7)**

Top View

Front View



### Ordering Information

#### Available Options:

B-13/15-155(C)-T-SSC5(7)(A)	B-13/15-155(C)-T-SSC5(7)(A)-G5	B-13/15-155(C)-T-SSC5(7)(A)-GR
B-13/15-155(C)-T-SFC5(7)(A)	B-13/15-155(C)-T-SFC5(7)(A)-G5	B-13/15-155(C)-T-SFC5(7)(A)-GR
B-13/15-155(C)-T-SST5(7)(A)	B-13/15-155(C)-T-SST5(7)(A)-G5	B-13/15-155(C)-T-SST5(7)(A)-GR
B-13/15-155(C)-T3-SSC5(7)(A)	B-13/15-155(C)-T3-SSC5(7)(A)-G5	B-13/15-155(C)-T3-SSC5(7)(A)-GR
B-13/15-155(C)-T3-SFC5(7)(A)	B-13/15-155(C)-T3-SFC5(7)(A)-G5	B-13/15-155(C)-T3-SFC5(7)(A)-GR
B-13/15-155(C)-T3-SST5(7)(A)	B-13/15-155(C)-T3-SST5(7)(A)-G5	B-13/15-155(C)-T3-SST5(7)(A)-GR

#### Part Numbering Definitions:

**B - 15/13 - 155 - T(3) - S xx Tx Power Temperature and Package -RoHS**

- **Wavelength**  
Tx Wavelength=1530nm  
Rx Wavelength=1310nm
- **Communication protocol**  
(155 Mbps)
- **T = +5V Transceiver**  
• **T3 = +3.3V Transceiver**
- **Single mode fiber**
- **Connector options**  
SC/ST/FC
- **Tx Power**  
5 = -5 to 0 dBm  
7 = -3 to +2 dBm
- **Temperature range and package**  
Blank = commercial temperature(0 to 70 °C)  
A = industrial temperature(-40 to 85 °C)
- **RoHS**  
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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