

B-13/15-155(C)-T(3)-Sxx3(4)



Features

- Diplexer Single Mode Single Fiber 1x9 SC/FC/ST Receptacle Connector
- Wavelength Tx 1310 nm/Rx 1530 nm
- SONET OC-3 SDH STM-1 Compliant
- Single +5V/+3.3V Power Supply
- PECL/LVPECL Differential Inputs and Output [B-13/15-155-T(3)-Sxx3(4)]
- TTL/LVTTL Differential Inputs and Output [B-13/15-155C-T(3)-Sxx3(4)]
- 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(C)-T-Sxx3(4)
Power Supply Voltage	V_{CC}	0	3.6	V	B-13/15-155(C)-T3-Sxx3(4)
Input Voltage	-	0	V_{CC}	V	
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}	-40	-	85	°C
Data Rate	-	-	155	-	Mbps

Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Optical Transmit Power	P_o	-14	-	-8	dBm	Output power is coupled into a 9/125 μ m single mode fiber.B-13/15-155(C)-T(3)-Sxx3
Optical Transmit Power	P_o	-8	-	-3	dBm	Output power is coupled into a 9/125 μ m single mode fiber.B-13/15-155(C)-T(3)-Sxx4
Output center Wavelength	λ	1260	1310	1360	nm	
Output Spectrum Width	$\Delta\lambda$	-	-	3	nm	RMS (σ)
Extinction Ratio	ER	8.2	-	-	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	Tx:1530 nm/ Rx:1310 nm
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}	-	-	140	mA	Maximum current is specified at V_{CC} = Maximum @ maximum temperature
Data Input Current-Low	I_{IL}	-350	-	-	μA	
Data Input Current-High	I_{IH}	-	-	350	μA	
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

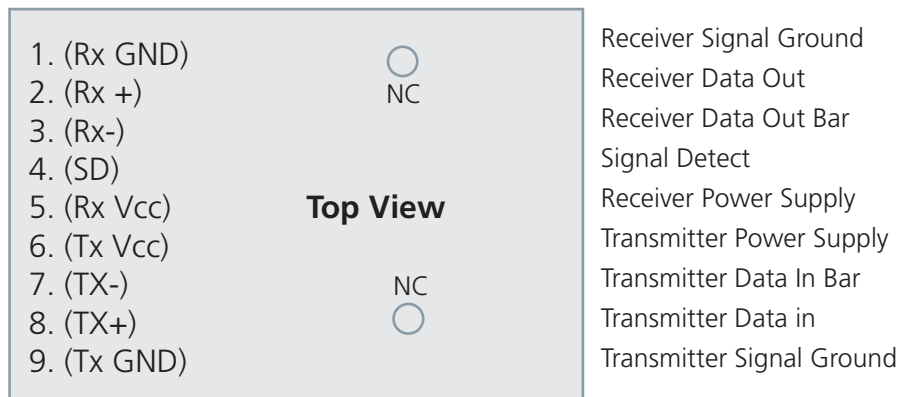
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Sensitivity	-	-	-	-33	dBm	Measured with 2 ²³ -1 PRBS, BER = 10 ⁻¹⁰
Maximum Input Power	P_{in}	-3	-	-	dBm	
Signal Detect-Asserted	P_a	-	-	-33	dBm	Measured on transition: low to high (Note1)
Signal Detect-Deasserted	P_d	-45	-	-	dBm	
Signal Detect-Hysteresis		1.0	-	4.0	dB	
Cross Talk	-	-	-	-33	dB	
Wavelength of Operation		1480	-	1600	nm	

Note 1: The SD level should be deasserted when fiber disconnected

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	$V_{OL}-V_{CC}$	-2.0	-	-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	B-13/15-155-T(3)-Sxx3(4)
Signal Detect Output Voltage-High	$V_{SDH}-V_{CC}$	-1.1	-	-0.74	V	
Signal Detect Output Voltage-Low	V_{SDL}	-	-	0.5	V	B-13/15-155C-T(3)-Sxx3(4)
Signal Detect Output Voltage-High	V_{SDH}	2.0	-	-	V	

Connection Diagram

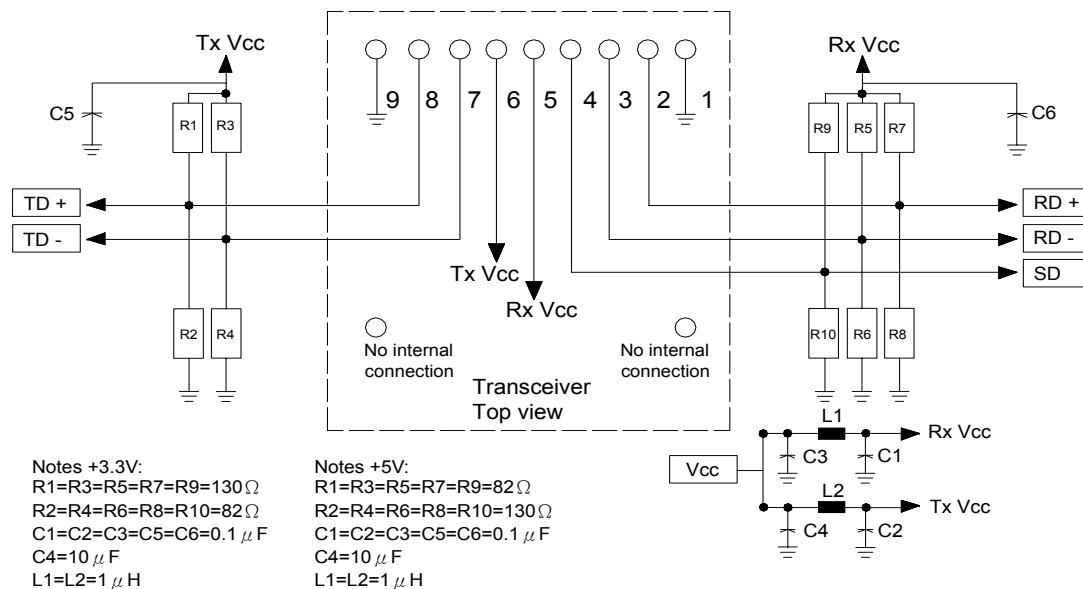


PIN	Symbol	Notes
1	RxGND	Directly connect this pin to the receiver ground plane
2	RD+	See recommended circuit schematic
3	RD-	See recommended circuit schematic
4	SD	Active high on this indicates a received optical signal
5	RxVcc	DC power for the receiver section
6	TxVcc	DC power for the transmitter section
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)-Sxx3(4)

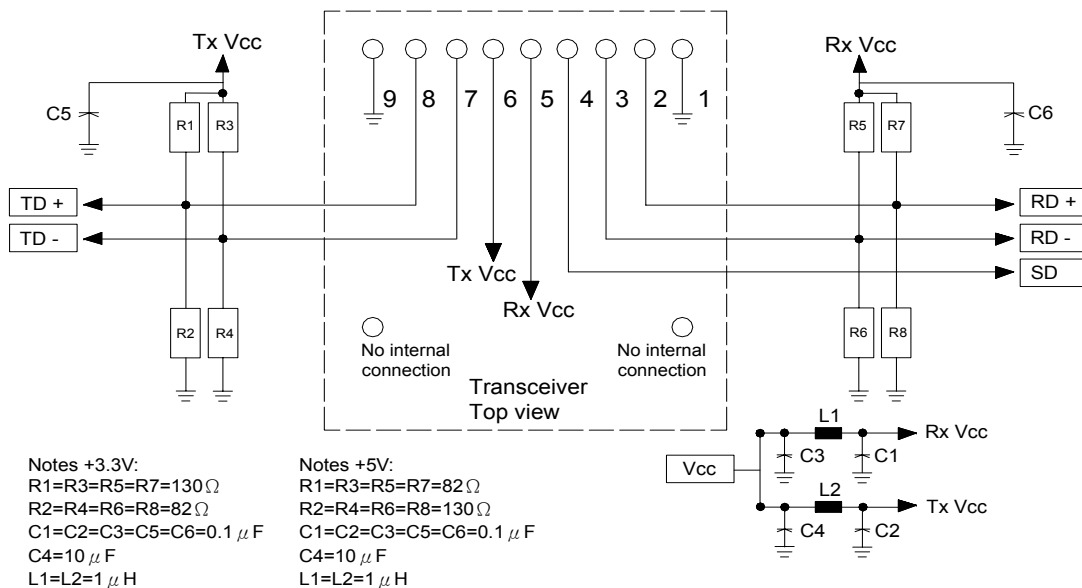
Recommended Circuit Schematic (3.3V/5V)

B-13/15-155-T(3)-Sxx3(4)



Recommended Circuit Schematic (3.3V/5V)

B-13/15-155C-T(3)-Sxx3(4)



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.

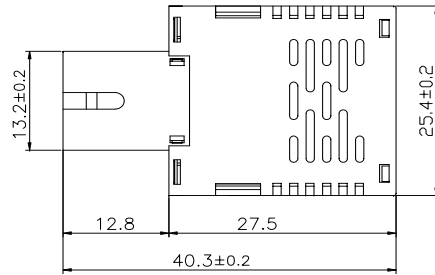
A GND plane under the module is required for good EMI and sensitivity performance.

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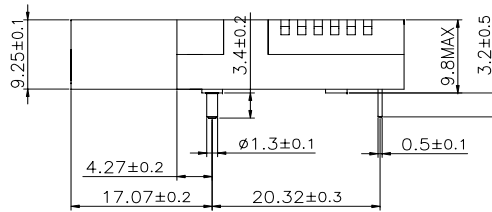
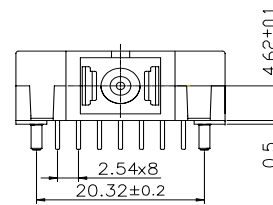
Package Diagram

B-13/15-155(C)-T(3)-SSC3(4)

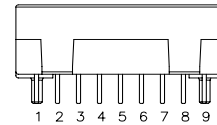
Top View



Front View

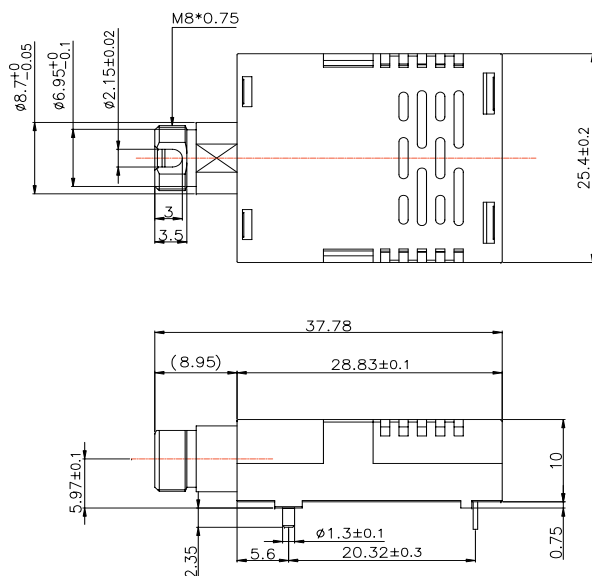


Side View

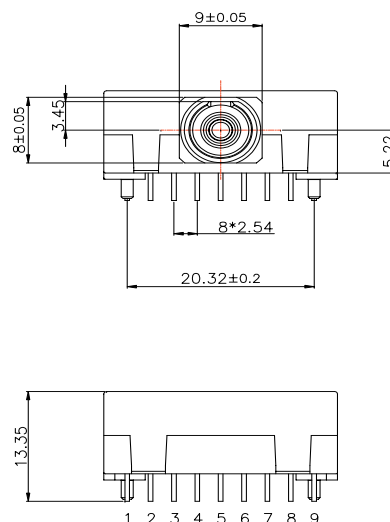


Rear View

Top View

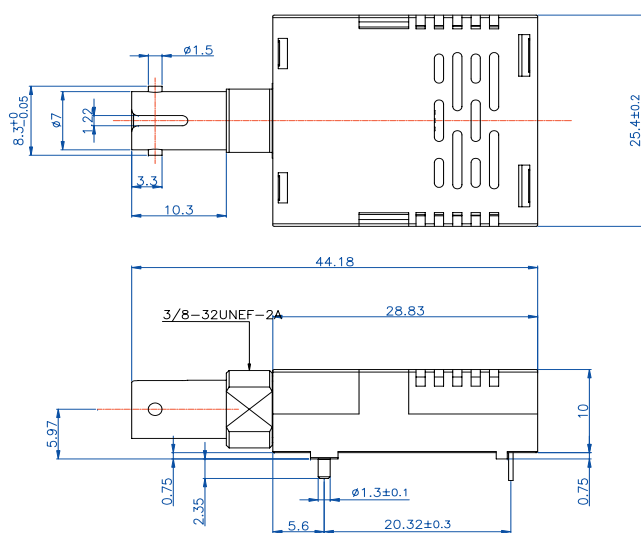


Front View

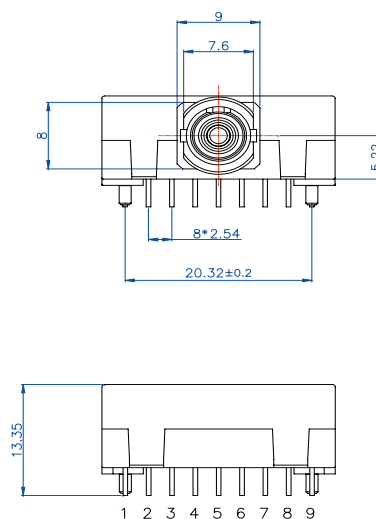


Package Diagram

Top View



Front View



Ordering Information

Available Options:

B-13/15-155(C)-T-SSC3(4)(A)	B-13/15-155(C)-T-SSC3(4)(A)-G5	B-13/15-155(C)-T-SSC3(4)(A)-GR
B-13/15-155(C)-T-SFC3(4)(A)	B-13/15-155(C)-T-SFC3(4)(A)-G5	B-13/15-155(C)-T-SFC3(4)(A)-GR
B-13/15-155(C)-T-SST3(4)(A)	B-13/15-155(C)-T-SST3(4)(A)-G5	B-13/15-155(C)-T-SST3(4)(A)-GR
B-13/15-155(C)-T3-SSC3(4)(A)	B-13/15-155(C)-T3-SSC3(4)(A)-G5	B-13/15-155(C)-T3-SSC3(4)(A)-GR
B-13/15-155(C)-T3-SFC3(4)(A)	B-13/15-155(C)-T3-SFC3(4)(A)-G5	B-13/15-155(C)-T3-SFC3(4)(A)-GR
B-13/15-155(C)-T3-SST3(4)(A)	B-13/15-155(C)-T3-SST3(4)(A)-G5	B-13/15-155(C)-T3-SST3(4)(A)-GR

Part Numbering Definitions:

	B	13/15	155(C)	T	(3)	-S	XX	Tx Power	Temperature and Package	-RoHS
• Wavelength Tx Wavelength=1310nm Rx Wavelength=1530nm										
• Communication protocol (155 Mbps) 155 = PECL Signal Detection Optupt 155C = TTL Signal Detection Optupt										
• T = +5 V Transceiver T3 = +3.3V Transceiver										
• Single mode fiber										
• Connector options SC/ST/FC										
• Tx Power 3 = -14 to -8 dBm 4 = -8 to -3 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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