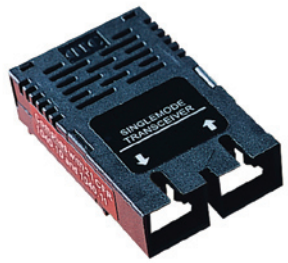
C-13-155(C)-T3-SXX3(5)



Features

- Duplex SC Single Mode Transceiver
- Industry Standard 1x9 Footprint
- Intermediate Reach SONET OC-3 SDH STM-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 Standard IEC 825 Compliant
- Uncooled Laser Diode with MQW Structure
- Complies with Telcordia (Bellcore) GR-468-CORE
- Temperature Range: 0 to 70°C
- C-13-155(C)-T3-SSC3(5) black case 10.4 mm
- SD LVPECL level C-13-155-T3-SXX3(5)
- SD LVTTL level C-13-155C-T3-SXX3(5)
- ATM 155 Mbps Links Application
- SONET/SDH Equipment Interconnect Application

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	T_{opr}	0	-	70	°C
Data Rate		-	155	-	Mbps

Transmitter Specifications, ($0<T_{opr}<70°C$, $3.1V<V_{CC}<3.5V$)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Optical Transmit Power	P_o	-15	-	-8	dBm	C-13-155(C)-T3-SXX3, output power is coupled into a 9/125 µm single mode fiber
Optical Transmit Power	P_o	-5	-	0	dBm	C-13-155(C)-T3-SXX5, output power is coupled into a 9/125 µm single mode fiber
Output Center Wavelength	λ	1261	1310	1360	nm	C-13-155(C)-T3-SXX3
Output Center Wavelength	λ	1263	1310	1360	nm	C-13-155(C)-T3-SXX5
Output Spectrum Width	Δλ	-	-	7.7	nm	RMS(σ), C-13-155(C)-T3-SXX3
Output Spectrum Width	Δλ			5	nm	RMS(σ), C-13-155(C)-T3-SXX5
Extinction Ratio	ER	8.2	-	-	dB	C-13-155(C)-T3-SXX3
Extinction Ratio	ER	10	-	-	dB	C-13-155(C)-T3-SXX5
Output Pulse Mask		Compliant with FDDI SMF-PMD1				
Output Eye		Compliant with ITU-T recommendation G.957				
Optical Rise Time	tr	-	-	2	ns	10% to 90% Values
Optical Fall Time	tf	-	-	2	ns	10% to 90% Values
Relative Intensity Noise	RIN	-	-	-116	dB/Hz	
Total Jitter	TJt	-	-	1.2	ns	Measured with 2^{23}-1 PRBS with 72 ones and 72 zeros.

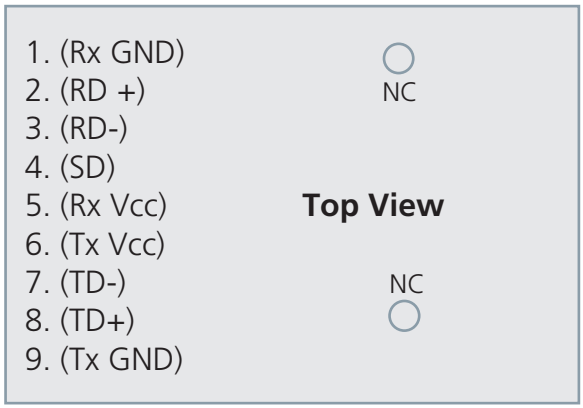
20550 Nordhoff St. • Chatsworth, CA 91311 • tel: 818.773.9044 • fax: 818.576.9486
9F, No 81, Shui Lee Rd. • Hsinchu, Taiwan, R.O.C. • tel: 886.3.5169222 • fax: 886.3.5169213

Transmitter Specifications, (0<T_{opr}<70°C, 3.1V<V_{CC}<3.5V)						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Electrical						
Power Supply Current	I_{CC}	-	-	160	mA	Maximum current is specified at Vcc= 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, (0<T_{opr}<70°C, 3.1V<V_{CC}<3.5V)						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Optical						
Sensitivity	-	-	-	-34	dBm	measured with 2^{23}-1 PRBS with 72 ones and 72 zeros. C-13-155-T3-SXX3
Sensitivity	-	-	-	-35	dBm	measured with 2^{23}-1 PRBS with 72 ones and 72 zeros. C-13-155(C)-T3-SXX5
Maximum Input Power	P_{in}	-7	-	-	dBm	C-13-155(C)-T3-SXX3
Maximum Input Power	P_{in}	0	-	-	dBm	C-13-155(C)-T3-SXX5
Signal Detect-Asserted	Pa	-	-	-34	dBm	C-13-155(C)-T3-SXX3, Measured on transition: low to high
Signal Detect-Asserted	Pa	-	-	-35	dBm	C-13-155(C)-T3-SXX5, Measured on transition: low to high
Signal Detect-Deasserted	Pd	-47	-	-	dBm	C-13-155-T3-SXX3(5) Measured on transition: high to low
Signal Detect-Hysteresis		1.0	-	4.0	dB	
Wavelength of Operation		1100	-	1600	nm	

Receiver Specifications, (0<T_{opr}<70°C, 3.1V<V_{CC}<3.5V)						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
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 LVPECL 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	C-13-155-T3-SXX3(5) LVPECL SD Output
Signal Detect Output Voltage-High	V_{SDH}- V_{cc}	-1.1	-	-0.74	V	
Signal Detect Output Voltage-Low	V_{SDL}	-	-	0.5	V	C-13-155(C)-T3-SXX3(5) LVTTL SD Output
Signal Detect Output Voltage-High	V_{SDH}	2.0	-	-	V	

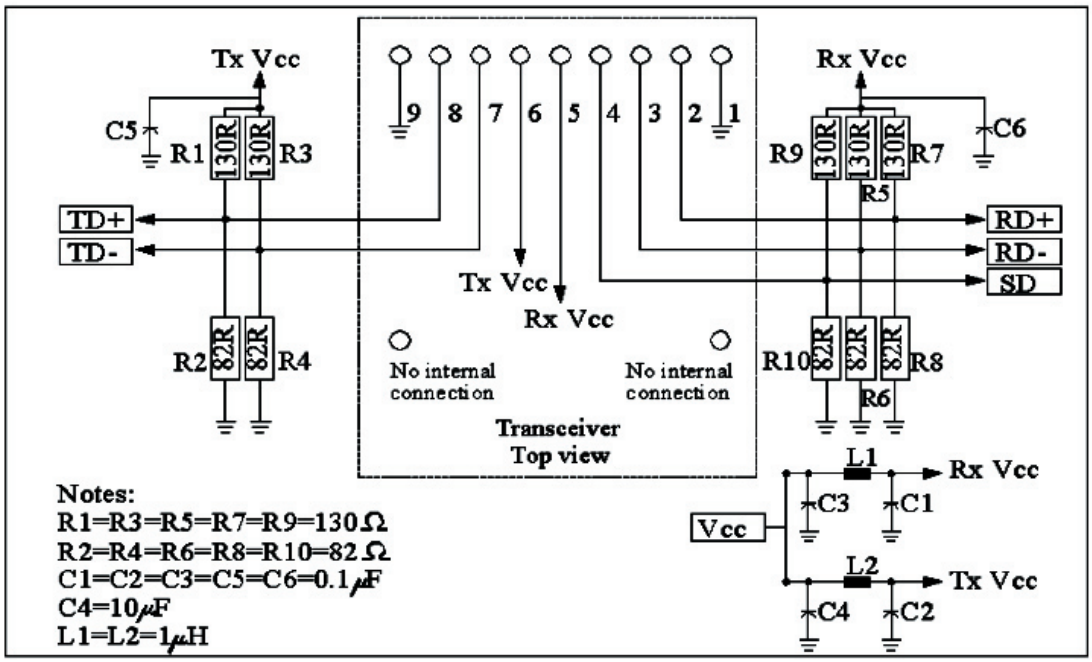
Connection Diagram



Receiver Signal Ground
Receiver Data Out
Receiver Data Out Bar
Signal Detect
Receiver Power Supply
Transmitter Power Supply
Transmitter Data In Bar
Transmitter Data in
Transmitter Signal Ground

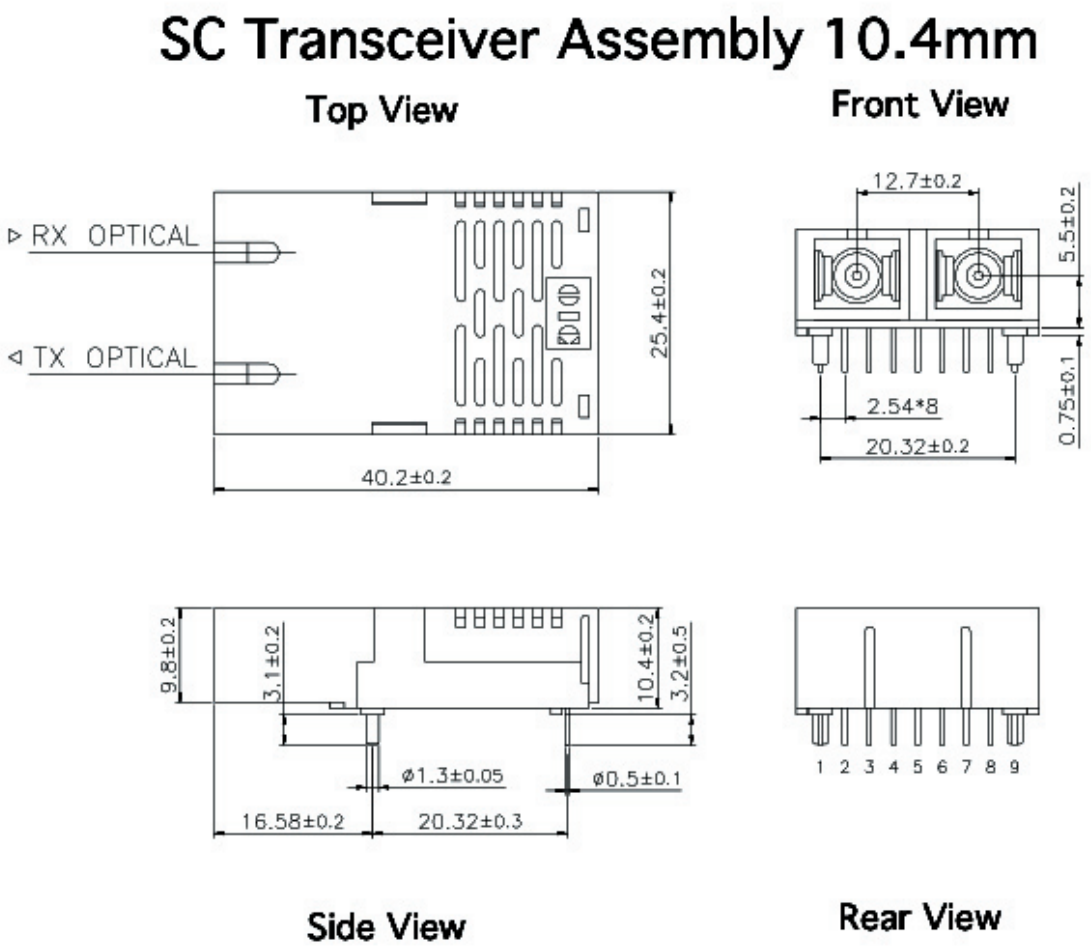
PIN	Symbol	Notes
1	RxGND	Directly connect this pin to the receiver ground plane
2	RD+	See recommended circuit schematic
3	RD-	See recommended circuit schematic
4	SD	Active high on this indicates a received optical signal
5	RxVcc	+3.3V dc power for the receiver section
6	TxVcc	+3.3V dc power for the transmitter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

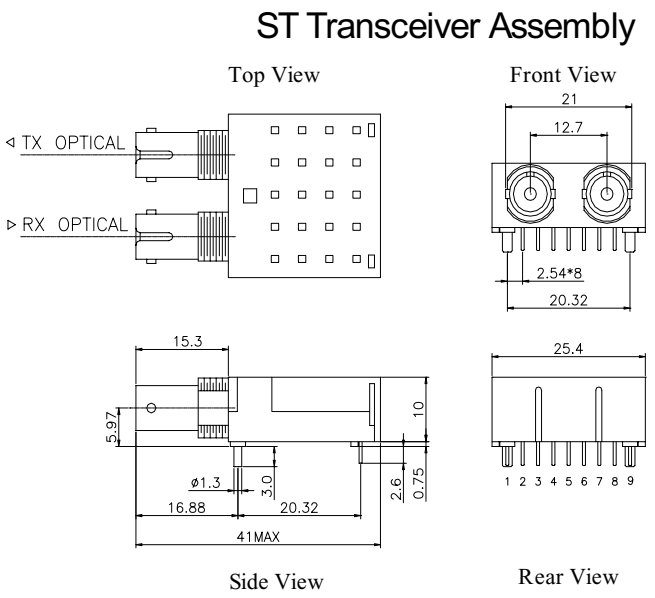


The split-loaded terminations for ECL signals need to be located at the input of devices receiving those ECL signals.
The power supply filtering is required for good EMI performance. Use short tracks from the inductor L1/L2 to the module Rx Vcc.
A GND plane under the module is required for good EMI and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

Package Diagram



Package Diagram

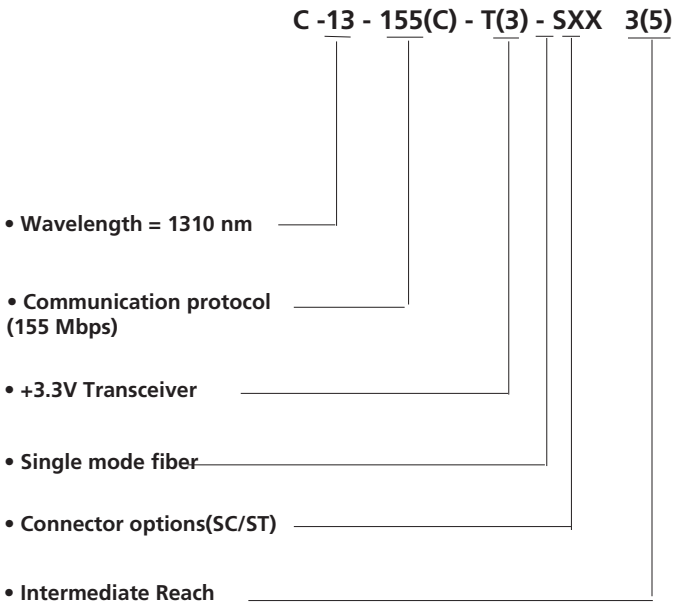


Qualification Information

The 155 Mbps SM Transceiver has passed the following qualification tests and meets the intent of Telcordia (Bellcore) GR-468-CORE.

Qualification Test	Condition	Sample Size	Reference
Mechanical Shock	500 g	11	MIL-STD-883
Vibration	20g, 20 Hz-2,000 Hz	11	MIL-STD-883D Method 2007
Solderability	-	11	MIL-STD-883E Method 2003.7
Thermal Shock	25°C	11	MIL-STD-883 Method 1011
Temperature Cycling	500 cycles	11	MIL-STD-883 Method 1010
Damp Heat	40°C, 95% RH, 1344 hrs	11	MIL-STD-202 Method 103
Cyclic Moisture Resistance	10 cycles	11	MIL-STD-883 Method 1004
ESD	± 500V	6	MIL-STD-883D Method 3015.7

Ordering Information



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.

Legal Notice

IMPORTANT NOTICE!
All information contained in this document is subject to change without notice, at Luminent's sole and absolute discretion. Luminent warrants performance of its products to current specifications only in accordance with the company's standard one-year warranty; however, specifications designated as "preliminary" are given to describe components only, and Luminent expressly disclaims any and all warranties for said products, including express, implied, and statutory warranties, warranties of merchantability, fitness for a particular purpose, and non-infringement of proprietary rights. Please refer to the company's Terms and Conditions of Sale for further warranty information.

Luminent assumes no liability for applications assistance, customer product design, software performance, or infringement of patents, services, or intellectual property described herein. No license, either express or implied, is granted under any patent right, copyright, or intellectual property right, and Luminent makes no representations or warranties that the product(s) described herein are free from patent, copyright, or intellectual property rights. Products described in this document are NOT intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. Luminent customers using or selling products for use in such applications do so at their own risk and agree to fully defend and indemnify Luminent for any damages resulting from such use or sale.

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROVIDED ON AN "AS IS" BASIS. Customer agrees that Luminent is not liable for any actual, consequential, exemplary, or other damages arising directly or indirectly from any use of the information contained in this document. Customer must contact Luminent to obtain the latest version of this publication to verify, before placing any order, that the information contained herein is current.