

**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 LVTTTL 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 <sub>CC</sub>	0	3.6	V	
Output Current	I <sub>out</sub>	0	30	mA	
Soldering Temperature	-	-	260	°C	10 seconds on leads only
Operating Temperature	T <sub>opr</sub>	0	70	°C	
Storage Temperature	T <sub>stg</sub>	-40	85	°C	

**Recommended Operating Condition**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	V <sub>CC</sub>	3.1	3.3	3.5	V
Operating Temperature	T <sub>opr</sub>	0	-	70	°C
Data Rate		-	155	-	Mbps

**Transmitter Specifications, (0<T<sub>opr</sub><70°C, 3.1V<V<sub>CC</sub><3.5V)**

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Optical</b>						
Optical Transmit Power	P <sub>o</sub>	-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 <sub>o</sub>	-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	t <sub>r</sub>	-	-	2	ns	10% to 90% Values
Optical Fall Time	t <sub>f</sub>	-	-	2	ns	10% to 90% Values
Relative Intensity Noise	RIN	-	-	-116	dB/Hz	
Total Jitter	TJt	-	-	1.2	ns	Measured with 2 <sup>23</sup> -1 PRBS with 72 ones and 72 zeros.

### Transmitter Specifications, (0<T<sub>opr</sub><70°C, 3.1V<V<sub>CC</sub><3.5V)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Electrical</b>						
Power Supply Current	I <sub>CC</sub>	-	-	160	mA	Maximum current is specified at V <sub>CC</sub> = Maximum @ maximum temperature
Data Input Current-Low	I <sub>IL</sub>	-350	-	-	μA	
Data Input Current-High	I <sub>IH</sub>	-	-	350	μA	
Differential Input Voltage	V <sub>IH</sub> -V <sub>IL</sub>	300	-	-	mV	
Data Input Voltage-Low	V <sub>IL</sub> -V <sub>CC</sub>	-2.0	-	-1.58	V	These inputs are compatible with 10K, 10KH and 100K ECL and PECL inputs
Data Input Voltage-High	V <sub>IH</sub> -V <sub>CC</sub>	-1.1	-	-0.74	V	

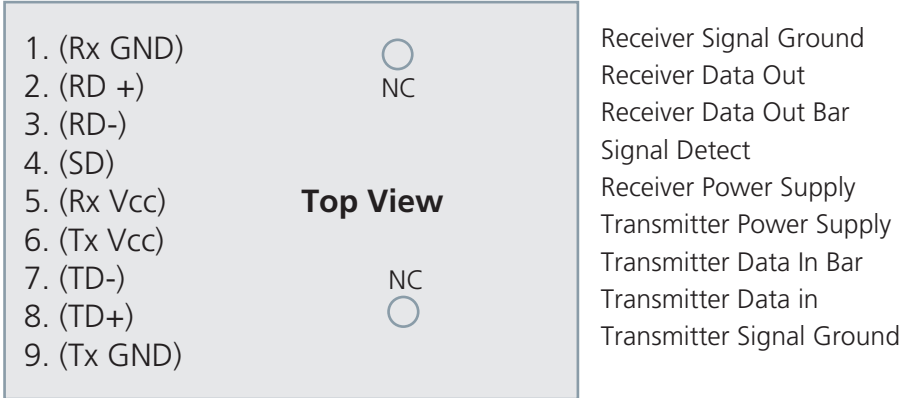
### Receiver Specifications, (0<T<sub>opr</sub><70°C, 3.1V<V<sub>CC</sub><3.5V)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Optical</b>						
Sensitivity	-	-	-	-34	dBm	measured with 2 <sup>23</sup> -1 PRBS with 72 ones and 72 zeros. C-13-155-T3-SXX3
Sensitivity	-	-	-	-35	dBm	measured with 2 <sup>23</sup> -1 PRBS with 72 ones and 72 zeros. C-13-155(C)-T3-SXX5
Maximum Input Power	P <sub>in</sub>	-7	-	-	dBm	C-13-155(C)-T3-SXX3
Maximum Input Power	P <sub>in</sub>	0	-	-	dBm	C-13-155(C)-T3-SXX5
Signal Detect-Asserted	P <sub>a</sub>	-	-	-34	dBm	C-13-155(C)-T3-SXX3, Measured on transition: low to high
Signal Detect-Asserted	P <sub>a</sub>	-	-	-35	dBm	C-13-155(C)-T3-SXX5, Measured on transition: low to high
Signal Detect-Deasserted	P <sub>d</sub>	-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<sub>opr</sub><70°C, 3.1V<V<sub>CC</sub><3.5V)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Electrical</b>						
Power Supply Current	I <sub>CC</sub>	-	-	100	mA	The current excludes the output load current
Data Output Voltage-Low	V <sub>OL</sub> -V <sub>CC</sub>	-2	-	-1.58	V	These outputs are compatible with 10K, 10KH and 100KECL and LVPECL outputs.
Data Output Voltage-High	V <sub>OH</sub> -V <sub>CC</sub>	-1.1	-	-0.74	V	
Signal Detect Output Voltage-Low	V <sub>SDL</sub> -V <sub>CC</sub>	-2	-	-1.58	V	C-13-155-T3-SXX3(5) LVPECL SD Output
Signal Detect Output Voltage-High	V <sub>SDH</sub> -V <sub>CC</sub>	-1.1	-	-0.74	V	
Signal Detect Output Voltage-Low	V <sub>SDL</sub>	-	-	0.5	V	C-13-155(C)-T3-SXX3(5) LVTTTL SD Output
Signal Detect Output Voltage-High	V <sub>SDH</sub>	2.0	-	-	V	

Connection Diagram



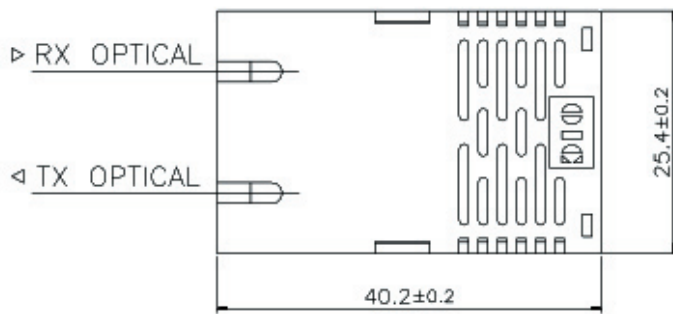
PIN	Symbol	Notes
1	RxGND	Directly connect this pin to the receiver ground plane
2	RD+	See recommended circuit schematic
3	RD-	See recommended circuit schematic
4	SD	Active high on this indicates a received optical signal
5	RxVcc	+3.3V dc power for the receiver section
6	TxVcc	+3.3V dc power for the transmitter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



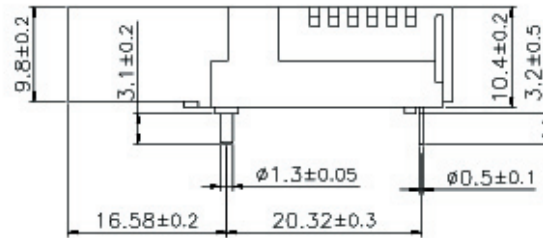
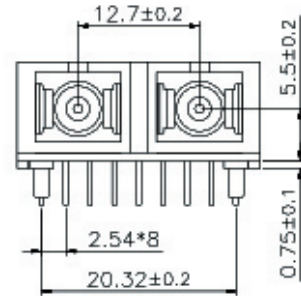
Package Diagram

# SC Transceiver Assembly 10.4mm

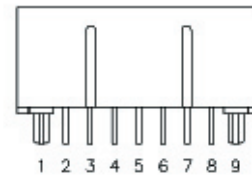
Top View



Front View



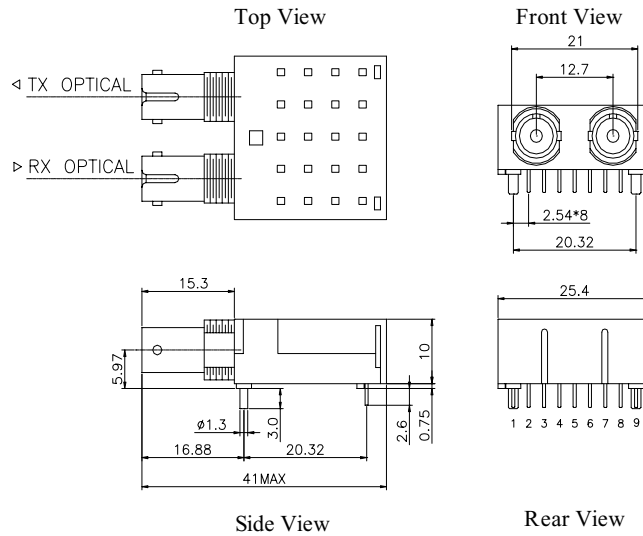
Side View



Rear View

Package Diagram

ST Transceiver Assembly



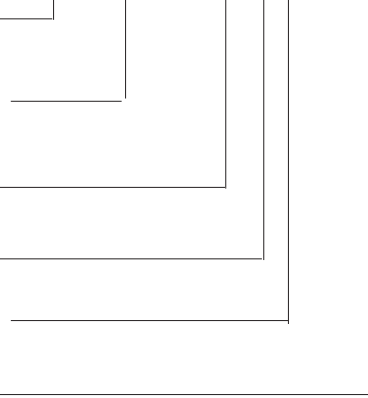
Qualification Information

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

C - 13 - 155(C) - T(3) - SXX 3(5)

- Wavelength = 1310 nm
  - Communication protocol (155 Mbps)
  - +3.3V Transceiver
  - Single mode fiber
  - Connector options(SC/ST)
  - Intermediate Reach
- 

## 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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