155 Mbps DFB Laser Single Mode Transceiver (Ultra-LR)

C-15-155-TDFB-SSC10X

Features
- Duplex SC Single Mode Transceiver
- Industry Standard 1x9 Footprint
- Ultra Long reach SONET OC-3 SDH STM-1 Compliant
- Single +5V Power Supply
- PECL Differential Inputs and Outputs
- Wave Solderable and Aqueous Washable
- Class 1 Laser Int. Safety Standard IEC 825 Compliant
- Operating at 0 to 70ºC
- Uncooled laser diode with MQW sturcture
- Complies with Telcordia (Bellcore) GR-468-CORE
- 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	6	V	
Output Current	I_{out}	0	30	mA	
Soldering Temperature	-	-	260	ºC	10 seconds on leads only
Operating temerature	T_{opr}	0	70	ºC	
Storage Temperature	T_{stg}	-40	85	ºC	

Recommended Operating Condition

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	V_{cc}	4.75	5	5.25	V
Operating Temperature	T_{opr}	0	-	70	ºC
Data Rate	-	-	155	-	Mbps

Transmitter Specifications, ($0ºC<T_{opr}<70ºC$, $4.75<V_{CC}<5.25$)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Optical Transmit Power	P_o	-3	-	+3	dBm	Output power is coupled into a 9/125µm single mode fiber
Output center Wavelength	λ	1500	1550	1600	nm	25ºC
Side Mode Suppression Ratio	Sr	30	35	-	dB	CW, P_o = 5mW
Output Spectrum Width	Δλ	-	-	1	nm	-20 dB width
Extinction Ratio	ER	8.2	-	-	dB	
Output Pulse Mask		Compliant with FDDI SMR-PMD1				
Output Eye		Compliant with ITU 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	TJ	-	-	1.2	ns	

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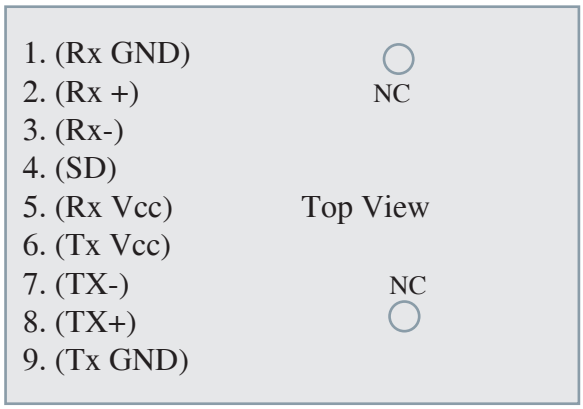
Transmitter Specifications, (0ºC<T_{opr}<70ºC, 4.75<V_{CC} <5.25)						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Electrical						
Power Supply Current	I_{CC}	-	-	180	mA	Maximum current is specified at Vcc= Maximum @ maximum temperature
Data Input Current-Low	I_{IL}	-350	-	-	µA	
Data Input Current-High	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, (0ºC<T_{opr}<70ºC, 4.75<V_{CC} <5.25)						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Sensitivity	-	-	-	-37	dBm	Measured with 2^{23}-1 PRBS with 72 ones and 72 zeros.
Maximum Input Power	P_{in}	0	-	-	dBm	
Signal Detect-Asserted	Pa	-	-	-37	dBm	Measured on transition: low to high
Signal Detect-Deasserted	Pd	-48	-	-	dBm	Measured on transition: high to low
Signal Detect-Hysteresis		1.0	-	4.0	dB	
Wavelength of Operation		1100	-	1600	nm	

Receiver Specifications, (0ºC<T_{opr}<70ºC, 4.75<V_{CC} <5.25)						
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 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	
Signal Detect Output Voltage-High	V_{SDH}- V_{cc}	1.1	-	0.74	V	

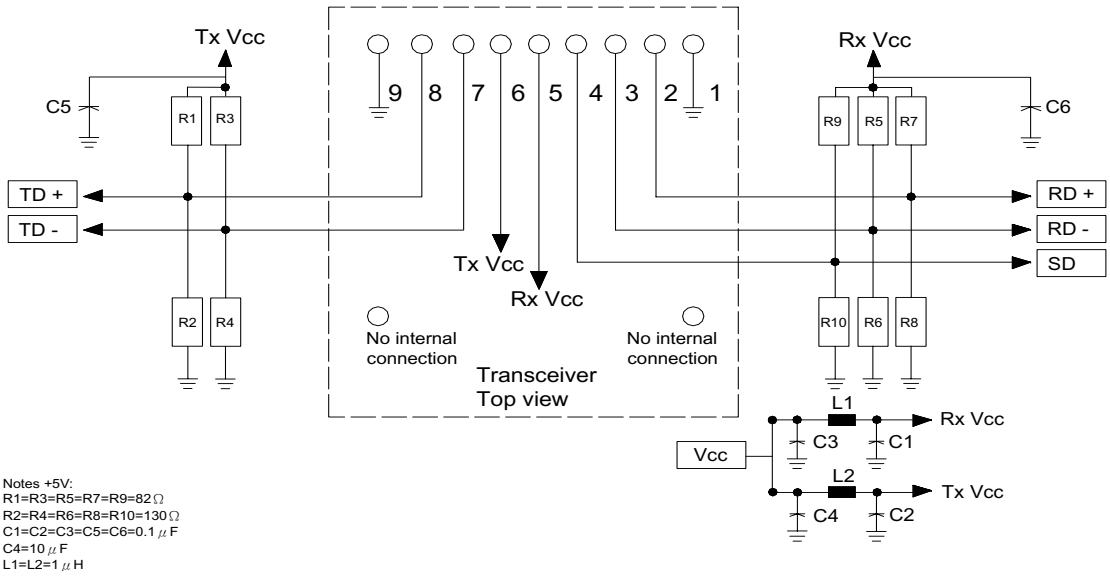
Connection Diagram



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	+5V dc power for the receiver section
6	TxVcc	+5 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



Notes +5V:
R1=R3=R5=R7=R9=82Ω
R2=R4=R6=R8=R10=130Ω
C1=C2=C3=C5=C6=0.1μF
C4=10μF
L1=L2=1μH

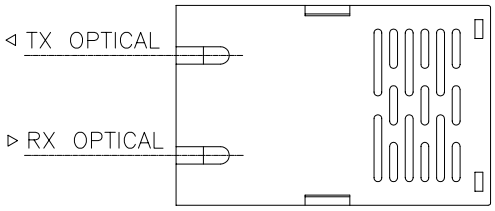
The split-loaded terminations for ECL signals need to be located at the input of devices receiving those ECL signals.
The power supply filtering is required for good EMI performance. Use short tracks from the inductor L1/L2 to the module Rx Vcc.
A GND plane under the module is required for good EMI and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

Package Diagram

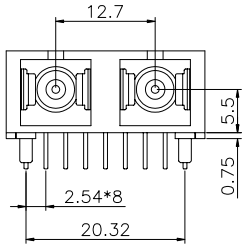
SC Transceiver Assembly 10.4mm

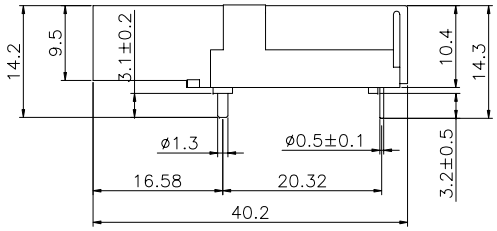
SC Transceiver Assembly 10.4mm

Top View

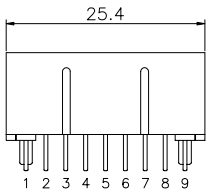


Front View





Side View

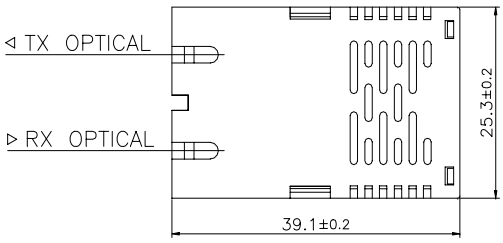


Rear View

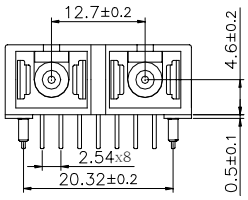
SC Transceiver Assembly 9.8mm

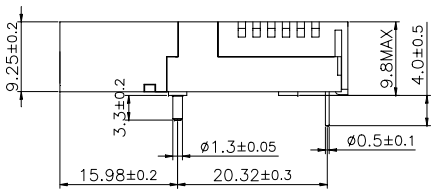
SC Transceiver Assembly 9.8mm

Top View

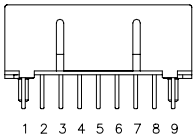


Front View





Side View



Rear View

D: Black case
E: Blue case

Ordering Information

C - 15 - 155 - TDFB - S SC 10 X

- Wavelength
  Tx Wavelength=1550nm
- Communication protocol
  (155 Mbps)
- DFB laser Transceiver
- Single mode fiber
- Connector options
- Ultra Long-Reach
- Blank: Black case 10.4 mm
  D: Black case 9.8 mm
  E: Blue case 9.8 mm

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

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