

1550nm
Singlemode

C-15-155-TDFB-SSC10
C-15-155-TDFB-SSC10D
C-15-155-TDFB-SSC10E

155 Mbps DFB Laser SM Transceiver (Ultra-LR)



Description

The C-15-155-TDFB-SSC10/D/E is a high performance module for bi-directional serial optical data communications. The nominal wavelength of 1550nm. The transmitter section uses a DFB laser. The receiver section uses a planar InGaAs PIN photodiode for low dark current and excellent responsivity. A PECL logic interface simplifies interface to external circuitry.

Features

- Duplex SC single mode transceiver
- Industry Standard 1 x9 Footprint
- Ultra Long reach SONET OC-3 SDH STM-1 Compliant
- Single+5V power Supply
- PECL Differential Inputs and Outputs
- Wave Solder able and Aqueous Washable
- Class 1 Laser Int. Safety Standard IEC 825 Compliant
- Operating at 0°C to +70°C
- Uncooled laser diode with MQW structure
- Complies with Bell core TA-NWT-000983

C-15-155-TDFB-S SC 10 D/E

□: black case 10.4mm
D: black case 9.8mm
E: black case 9.8mm

Ultra Long- Reach
Connector options
Single mode fiber
DFB laser Transceiver
Communication protocol
(155Mbps)
Wavelength=1550nm

Applications

- ATM 155 Mb/s Links
- SONET/SDH Equipment Interconnect

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V _{cc}	0	6	V	
Input Voltage	---	GND	V _{cc}	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 Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	V _{cc}	4.75	5	5.25	V
Operating Temperature	T _{opr}	0		70	°C
Data Rate			155		Mbit/s

Transmitter Specifications ($0^{\circ}\text{C} < T_{\text{opr}} < 70^{\circ}\text{C}$, $4.75\text{V} < V_{\text{CC}} < 5.25\text{V}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical						
Optical Transmit Power	P_o	-3	---	+3	dBm	Output power is coupled into a $9/125\ \mu\text{m}$ single mode fiber
Output Center Wavelength	λ	1500	1550	1600	nm	25°C
Side Mode Suppression	S_r	30	35		dB	CW, $P_o=5\ \text{mW}$
Output Spectrum Width	$\Delta\lambda$	---	---	1	nm	-20dB width
Extinction Ratio	E_R	8.2	---	---	dB	
Output Pulse Mask	Compliant with FDDI SMF-PMD1					
Output Eye	Compliant with Bellcore TR-NWT-000253 and ITU recommendation G.957					
Optical Rise Time	t_r			2	ns	10%-90% Values
Optical Fall Time	t_f			2	ns	10%-90% Values
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.

Electrical

Power Supply Current	I_{CC}			180	mA	Maximum current is specified at $V_{\text{CC}}=\text{Maximum}$ @maximum temperature.
Data Input Current-Low	I_{IL}	-350			μA	
Data Input Current-High	I_{IH}			350	μA	
Differential Input Voltage	$V_{\text{IH}}-V_{\text{IL}}$	300			mV	
Data Input Voltage-Low	$V_{\text{IL}}-V_{\text{CC}}$	-2.0		-1.58	V	These inputs are compatible with 10K, 10KH and 100K ECL and PECL inputs.
Data Input Voltage-High	$V_{\text{IH}}-V_{\text{CC}}$	-1.1		-0.74	V	

Receiver Specifications ($0^{\circ}\text{C} < T_{\text{opr}} < 70^{\circ}\text{C}$, $4.75\text{V} < V_{\text{CC}} < 5.25\text{V}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical						
Sensitivity	---	---		-37	dBm	Measured with $2^{23}-1$ PRBS with 72 ones and 72 zeros.(ITU-T recommendation G.958)
Maximum Input Power	P_{in}	0		---	dBm	
Signal Detect – Asserted	P_a	---		-37	dBm	Measured on transition: low to high
Signal Detect –Deasserted	P_d	-48		---	dBm	Measured on transition: high to low
Signal detect –Hysteresis		1.0		4.0	dB	
Wavelength of Operation		1100		1600	nm	
Electrical						
Power Supply Current	I_{CC}			100	mA	The current excludes the output load current
Data output Voltage—Low	$V_{\text{OL}}-V_{\text{CC}}$	-2		-1.58	V	These outputs are compatible with 10K, 10KH and 100KECL and PECL outputs.
Data output Voltage—High	$V_{\text{OH}}-V_{\text{CC}}$	-1.1		-0.74	V	
Signal Detect Output Voltage—Low	$V_{\text{SDL}}-V_{\text{CC}}$	-2		-1.58	V	
Signal Detect Output Voltage—High	$V_{\text{SDH}}-V_{\text{CC}}$	-1.1		-0.74	V	

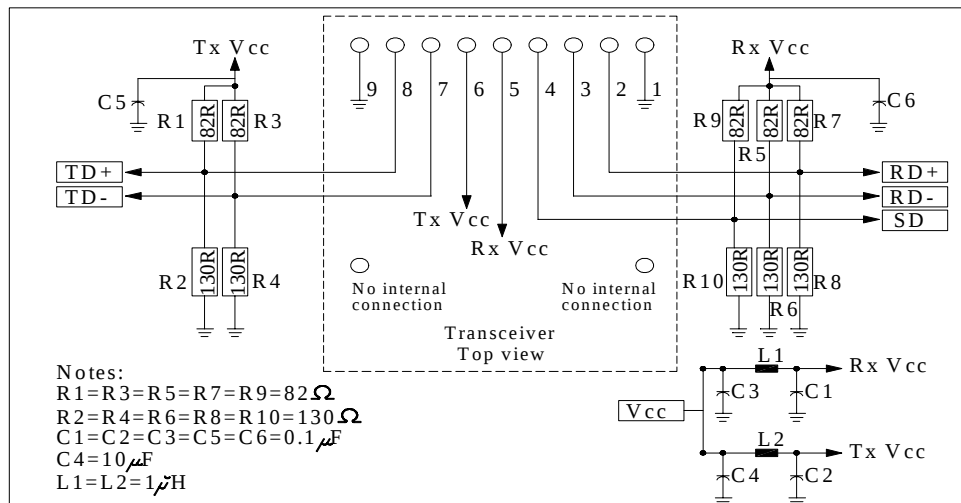
CONNECTION DIAGRAM

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

- 1.(RX GND)
- 2.(RX+)
- 3.(RX-)
- 4.(SD)
- 5.(RX Vcc)
- 6.(TX Vcc)
- 7.(TX-)
- 8.(TX+)
- 9.(TX GND)

TOP VIEW○
NC○
NC

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	+5V 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

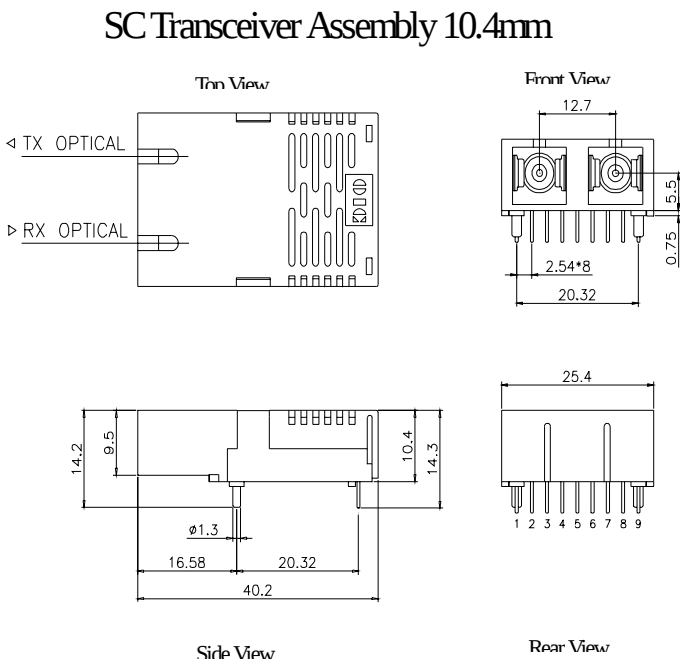
RECOMMENDED CIRCUIT SCHEMATIC

The split-load 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 and Tx Vcc. A GND plane under the module is required for good EMI and sensitivity performance.

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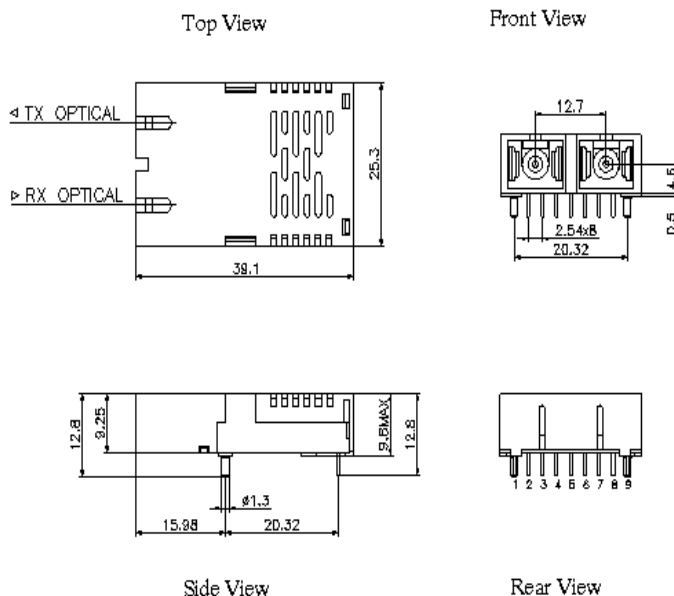
PACKAGE DIAGRAM
 Units in mm

C-15-155-TDFB-SSC10



C-15-155-TDFB-SSC10D/SSC10E

SC Transceiver Assembly 9.8mm



D: black case

E: blue case

LASER SAFETY

This single mode transceiver is a Class1 laser product. It complies with IEC 825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical ports of the module shall determinate with an optical connector or with a dust plug.