155 Mbps bi-directional SC Receptacle Single Fiber Transceiver

B-15/13-155-FDFB-SSC5

Features

- Diplexer Single Mode Single Fiber 2x5 SFF SC Receptacle connector
- Tx 1550nm/Rx 1310 nm
- SONET OC-3 SDH STM-1 Compliant
- Single +3.3V Power Supply
- LVPECL Differential Inputs and Outputs
- Wave Solderable and Aqueous Washable
- Class 1 Laser Int. Safety Standard IEC-825 Compliant
- Uncooled Laser diode with MQW structure
- Complies with Telcordia (Bellcore) GR-468-CORE
- EMI Shielding Finger Optional
- RoHS compliance available

Absolute Maximum Rating

Parameter	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V_{cc}	0	3.6	V	
Input Voltage	-	0	Vcc	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}	3.1	3.3	3.5	V
Operating Temperature	T_{opr}	0	-	70	°C
Data Rate	-	-	155	-	Mbps

Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Optical Transmit Power	P_o	-5	-	0	dBm	Output Power is coupled into a 9/125 µm single mode fiber
Output center Wavelength	λ	1480	1550	1580	nm	
Output Spectrum Width	Δλ	-	-	1	nm	-20dB width
Side Mode Supression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	10	-	-	dB	
Output Eye		Compliant with ITU 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
Relative Intensity Noise	RIN	-	-	-116	dB/Hz	
Total Jitter	TJ	-	-	1.0	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						
Supply Current	I_{CC}	-	-	140	mA	Maximum current is specified at Vcc= Maximum @ maximum temperature
Transmit Enable Voltage	V_{EN}	0		0.8	V	
Transmit Disable Voltage	V_{DIS}	V_{CC}-1.3		V_{CC}	V	
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

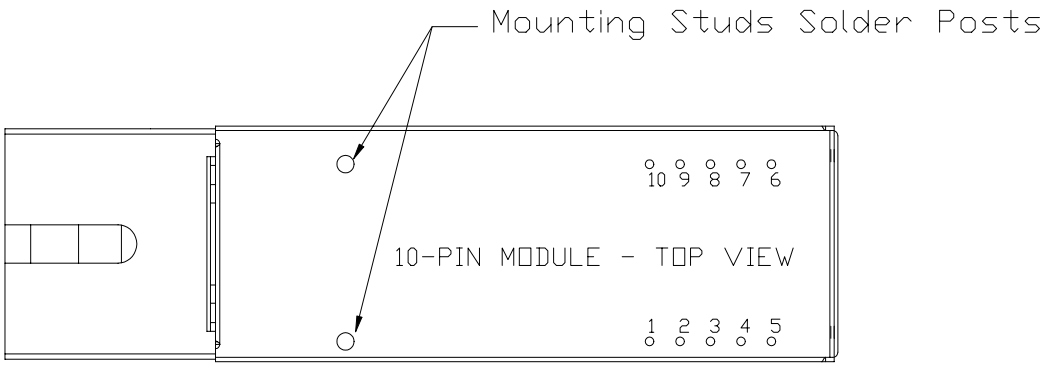
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Sensitivity	-	-	-	-34	dBm	Measured with 2^{23}-1 PRBS,BER= 10^{-10}
Maximum Input Power	P_{in}	-3	-	-	dBm	
Signal Detect-Asserted	Pa	-	-	-34	dBm	Measured on transition: low to high (Note 1)
Signal Detect-Deasserted	Pd	-45	-	-	dBm	Measured on transition: high to low (Note 1)
Signal Detect-Hysteresis	-	1	-	4	dB	
Cross Talk	-	-	-	-33	dB	
Wavelength of Operation		1260	-	1360	nm	

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

Receiver Specifications

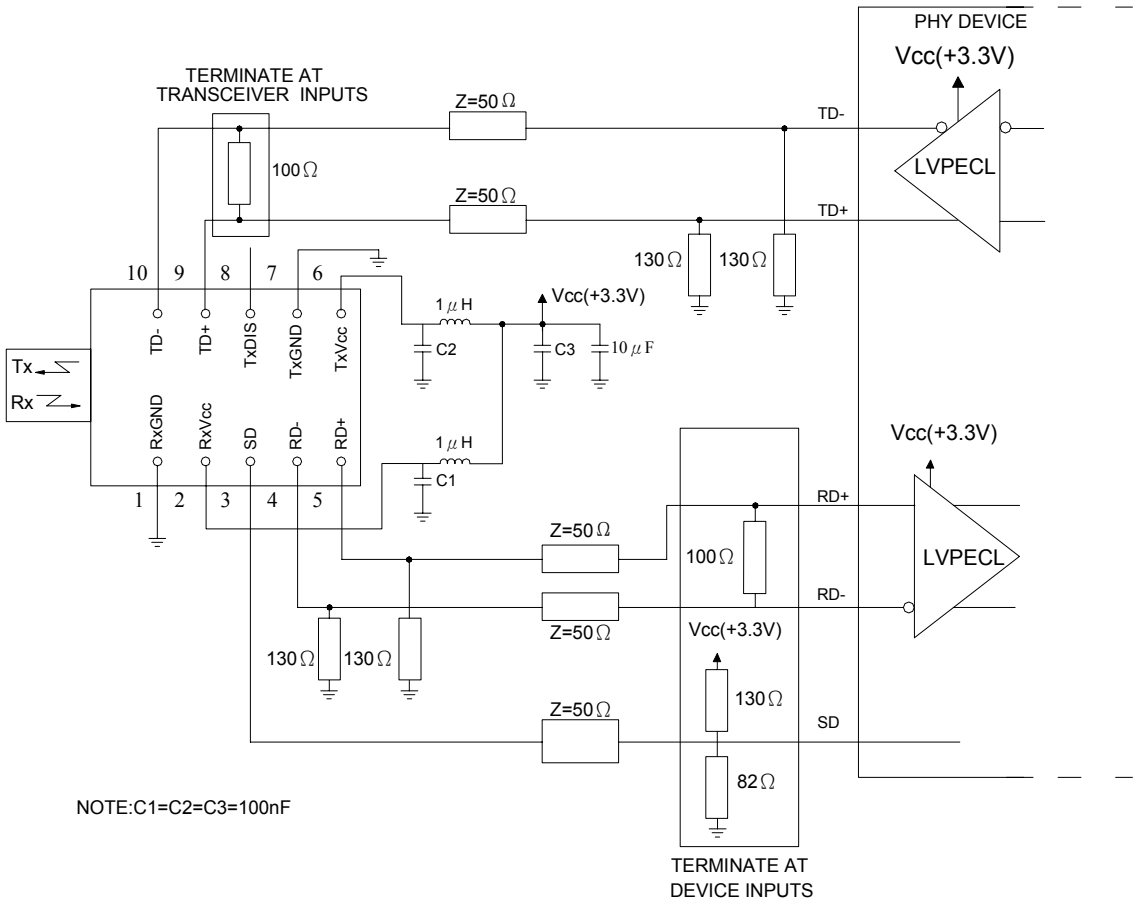
Parameter	Symbol	Min	Typical	Max	Unit	Note
Electrical						
Supply Current	I_{CC}	-	-	100	mA	The current excludes the output load current
Data Output Voltage-Low	V_{OL} -V_{cc}	-2.0	-	-1.58	V	These outputs are compatible with 10K, 10KH and 100KECL and PECL outputs
Data Output Voltage-High	V_{OH}- V_{cc}	-1.1	-	-0.74	V	
Signal Detect Output Voltage-Low	V_{SDL}-V_{cc}	-2.0	-	-1.58	V	
Signal Detect Output Voltage-High	V_{SDH}- V_{cc}	-1.1	-	-0.74	V	

Connection Diagram



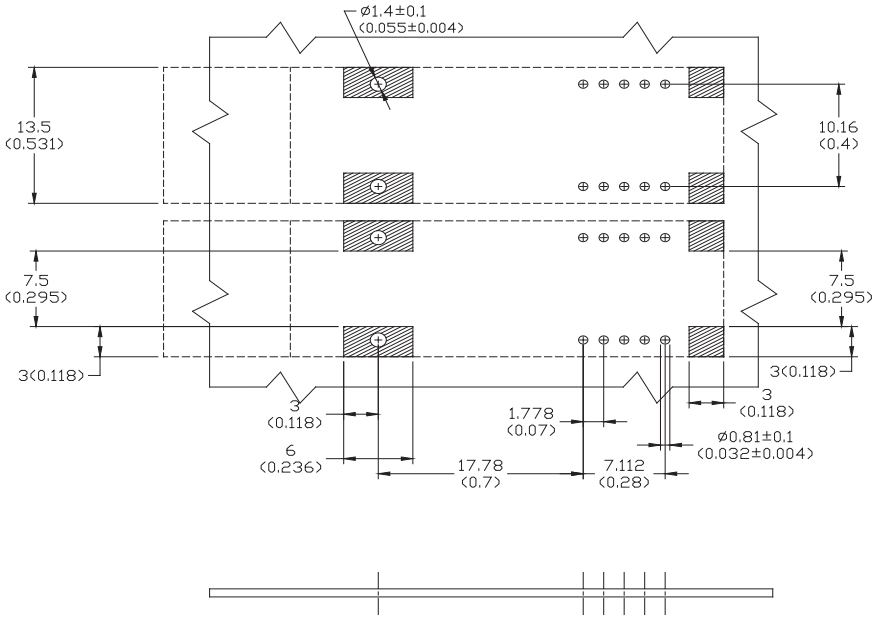
PIN	Symbol	Notes
1	RxGND	Directly connect this pin to the receiver ground plane
2	RxVcc	+3.3V dc power for the receiver section
3	SD	Active high on this indicates a received optical signal(LVPECL)
4	RD-	Receiver Data Out Bar(LVPECL)
5	RD+	Receiver Data Out (LVPECL)
6	TxVcc	+3.3V dc power for the transmitter section
7	TxGND	Directly connect this pin to the tranmitter ground plane
8	TxDIS	Transmitter disable(LVTTL)
9	TD+	Transmitter Data In (LVPECL)
10	TD-	Transmitter Data In Bar (LVPECL)

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.

Recommended Circuit Board Layout



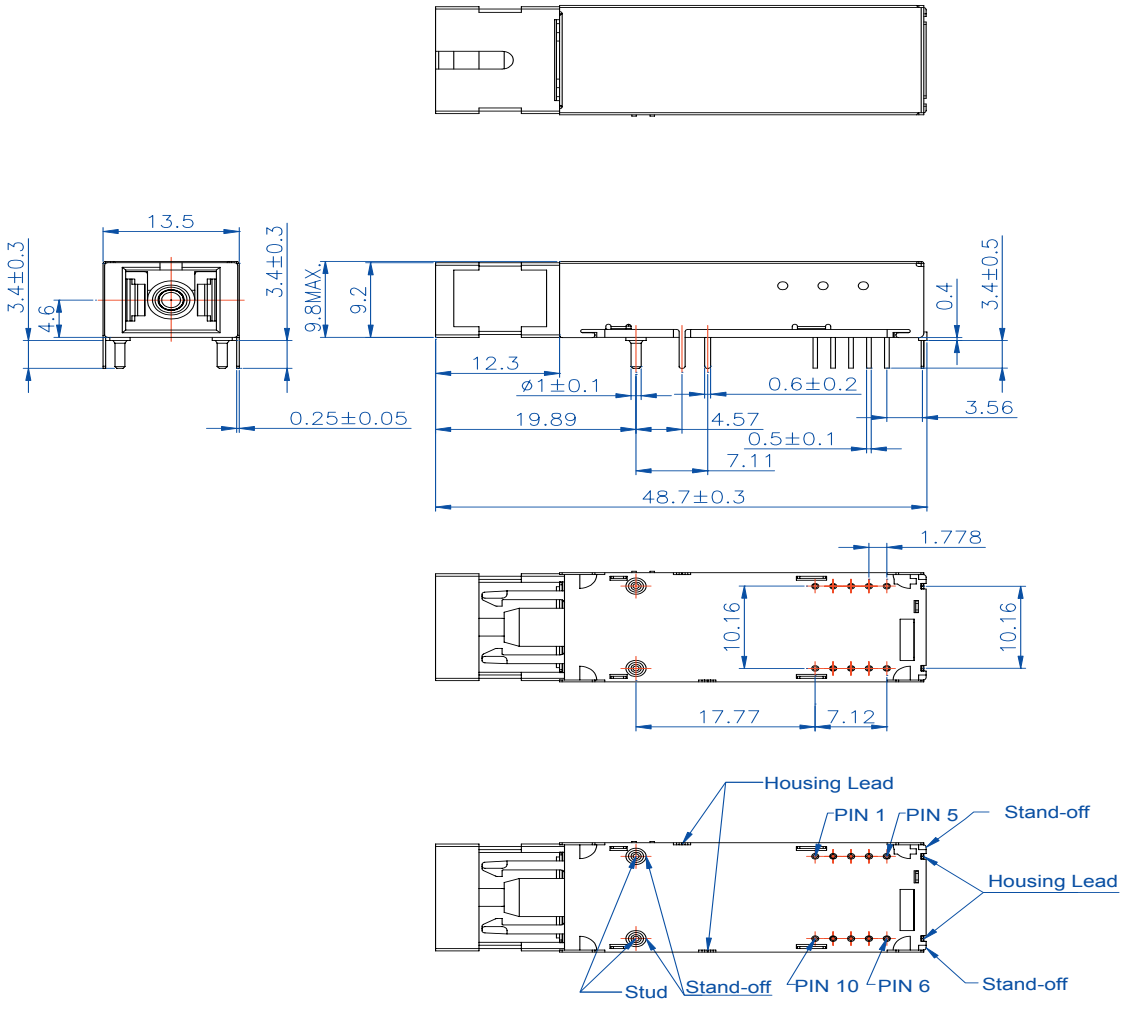
DIMENSION IN MILLIMETER (INCHES)

NOTES:
1.THIS FIGURE DESCRIBE THE RECOMMAND CIRCUIT BOARD LAYOUT FOR THE SFF TRANSCEIVER.
2.THE HATCHED AREAS ARE KEEP-OUT AREAS RESERVED FOR HOUSING STANDOFF. NO METAL TRACES OR GROUND CONNECTION IN KEEP-OUT AREAS.
3.THE MOUNTING STUDS SHOULD BE SOLDERED TO CHASSIS GROUND FOR MECHANICAL INTEGRITY.

Package Diagram

B-15/13-155-FDFB-SSC5

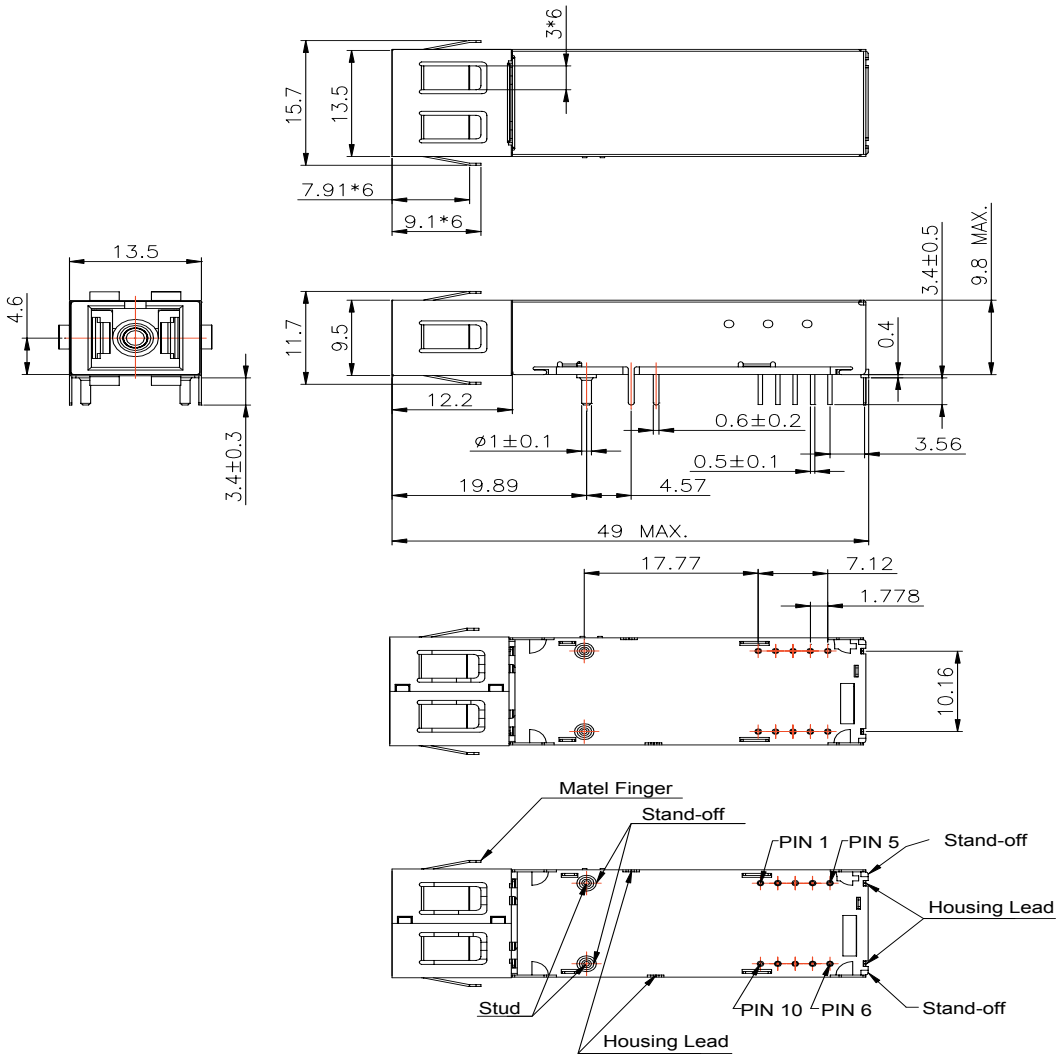
Units: mm



Package Diagram

B-15/13-155-FDFB-SSC5S

Units: mm



Ordering Information

Available Options:
B-15/13-155-FDFB-SSC5
B-15/13-155-FDFB-SSC5-G5
B-15/13-155-FDFB-SSC5S
B-15/13-155-FDFB-SSC5S-G5

Part numbering Definition:

B - 15/13 - 155 - FDFB - S SC Tx Power Shielding Finger -RoHS

- **Wavelength**
  15/13: Tx Wavelength=1550nm
  Rx Wavelength=1310nm
- **Communication protocol**
  (155 Mbps)
- **FDFB= SFF Transceiver, DFB**
- **Single mode fiber**
- **Connector options**
- **Tx Output Power**
  5 = Tx power -5 to 0 dBm
- **Shielding Finger Option**
  Blank = No Shieding Finger
  S = With Shieding Finger
- **RoHS**
  Blank = RoHS non-compliant product
  G5 = RoHS 5/6-compliant product (lead 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.

Legal Notes:

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