

BIDI
Singlemode

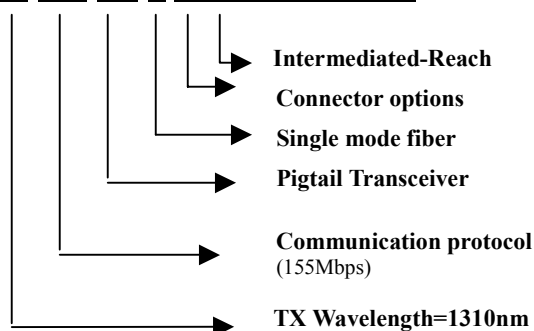
B-13-155-TP-SSC3
B-13-155-TP-SFC3
B-13-155-TP-SST3

155 Mbps Bi-directional Single Fiber Transceiver



Ordering information

B-13-155-TP-S SC3 (FC3 / ST3)



Description

The B-13-155-TP-SSC3 (FC3 / ST3) bi-directional single mode single fiber transceivers are high performance modules for bi-directional serial optical data communications such as SONET OC3 SDH STM1(L1.1). These modules are designed for single mode fiber and transmitter operate at a nominal wavelength of 1310nm. The transmitter section uses a multiple quantum well FP laser and is a class 1 laser compliant according to International Safety Standard IEC-825. The receiver section uses a planar InGaAs PIN photodiode for low dark current and excellent responsivity. An integrated WDM coupler (1310 nm transmit / 1550 nm reflect) to separate 1310 nm output light and 1550 nm input light A PECL logic interface simplifies interface to external circuitry.

Preliminary

Features

- Coaxial single mode single fiber package with optional SC/FC/ST connector
- Wavelength TX 1310 nm / RX 1550 nm
- SONET OC-3 SDH STM-1(L1.1) Compliant
- Single +5V Power Supply
- PECL Differential Inputs and Outputs
- Wave Solderable and Aqueous Washable
- LED Multisourced 1 x 9 Transceiver Interchangeable
- Class 1 Laser Int. Safety Standard IEC 825 Compliant
- Uncooled Laser diode with MQW structure
- Complies with Bellcore TA-NWT-000983
- Temperature Range: -40 to +85°C
- Optical Isolation > 30 dB
- Cross Talk < -45 dB

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	Vcc	0	6	V	
Input Voltage	---	GND	Vcc	V	
Output Current	Iout	0	30	mA	
Soldering Temperature	---		260	°C	10 seconds on leads only
Operating Temperature	T _{opr}	-40	85	°C	
Storage Temperature	T _{stg}	-40	85	°C	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	Vcc	4.75	5	5.25	V
Operating Temperature	T _{opr}	-40		85	°C
Data Rate			155		Mbit/s

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Transmitter Specifications ($-40^{\circ}\text{C} < T_{\text{opr}} < 85^{\circ}\text{C}$, $4.75\text{V} < V_{\text{cc}} < 5.25\text{V}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical						
Optical Transmit Power	P_o	-13	---	-8	dBm	Output power is coupled into a $9/125\ \mu\text{m}$ single mode fiber
Output Center Wavelength	λ	1261	1310	1360	nm	
Output Spectrum Width	$\Delta\lambda$	---	---	7.7	nm	RMS
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
Optical Isolation		30			dB	Tx : 1310 nm / Rx : 1550 nm
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}			140	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 ($-40^{\circ}\text{C} < T_{\text{opr}} < 85^{\circ}\text{C}$, $4.75\text{V} < V_{\text{cc}} < 5.25\text{V}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical						
Sensitivity	---	---		-33	dBm	Measured with $2^{23} - 1$ PRBS with 72 ones and 72 zeros.(ITU-T recommendation G.958)
Maximum Input Power	P_{in}	-3		---	dBm	
Signal Detect – Asserted	P_a	---		-33	dBm	Measured on transition: low to high
Signal Detect –Deasserted	P_d	-45		---	dBm	Measured on transition: high to low
Signal detect –Hysteresis		1.0		4.0	dB	
Cross Talk				-45	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	



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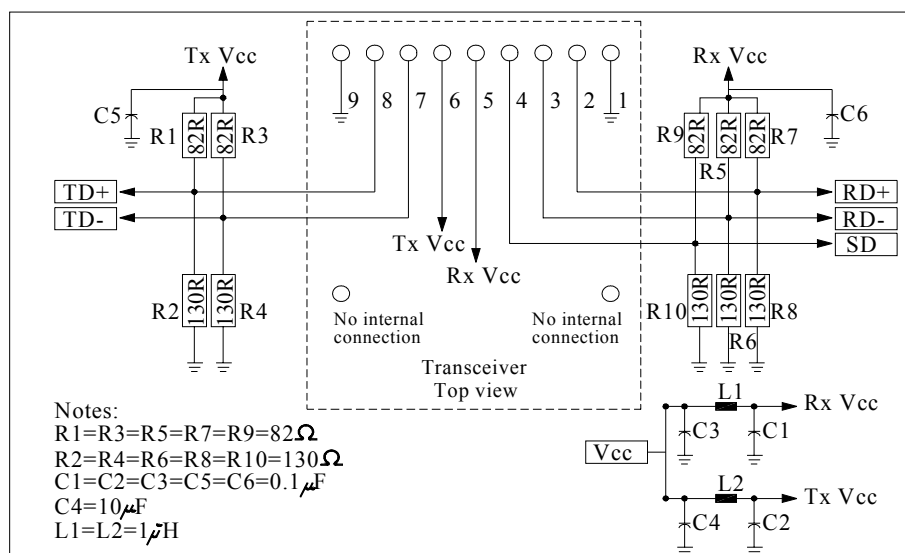
TEL: 886-3-516-9222 FAX: 886-3-516-9213 Email: oic-sales@oic.com.tw <http://www.oic.com.tw>

CONNECTION DIAGRAM**Preliminary**

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. (RD+)	○
3. (RD-)	N/C
4. (SD)	
5. (Rx Vcc)	TOP VIEW
6. (Tx Vcc)	
7. (TD-)	
8. (TD+)	N/C
9. (Tx GND)	○

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 plan 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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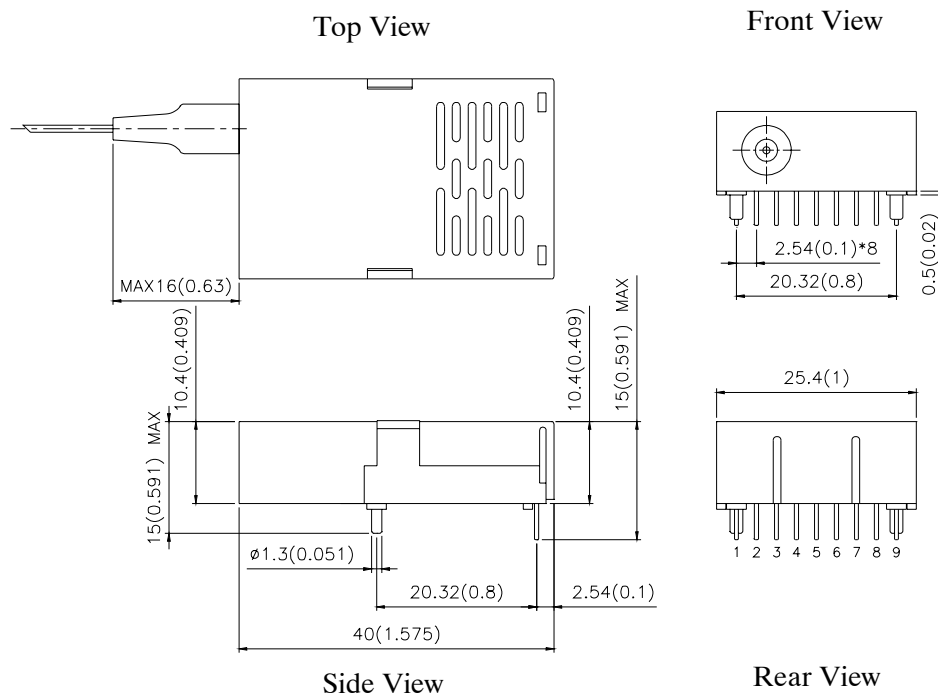
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PACKAGE DIAGRAM

Preliminary

Units in mm (inch)

B-13-155-TP-SSC3(FC3/ST3)



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.