P/N: C-1x-1250(C)-TDFB(3)-SSC(2/3/4)x-G5
1.25 Gbps Single Mode Transceiver

Features

- SC Duplex Single Mode Transceiver
- Industry Standard 1x9 Footprint
- Gigabit Ethernet Compliant
- Single +3.3/5V Power Supply
- PECL Differential Inputs and Outputs
- PECL/LVPECL Signal Detection Output [C-1x-1250-TDFB(3)-SSC(2/3/4)]
- TTL/LVTTL Signal Detection Output [C-1x-1250C-TDFB(3)-SSC(2/3/4)]
- Wave Solderable and Aqueous Washable
- Uncooled laser diode with MQW structure
- Complies with Telcordia (Bellcore) GR-468-CORE
- Gigabit Ethernet Application
- RoHS compliance available

Table 1 – Absolute Maximum Rating

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Power Supply Voltage	Vcc	0	-	6	V	
Power Supply Voltage	Vcc	0	-	3.6	V	
Output Current	I_{out}	-	-	30	mA	
Soldering Temperature	-	-	-	260	ºC	1
Storage Temperature	T_{stg}	-40	-	85	ºC	

Note 1: 10 seconds on leads only

Table 2 – Recommended Operating Condition

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Power Supply Voltage	Vcc	4.75	5	5.25	V	
Power Supply Voltage	Vcc	3.1	3.3	3.5	V	
Operating Temperature (Case)	T_{opr}	0	-	70	ºC	2
Operating Temperature (Case)	T_{opr}	-40	-	85	ºC	
Data Rate	DR	-	1250	-	Mbps	

Note 2: Please refer to ordering information

Table 3 – Transmitter Specifications (Optical)

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Optical Transmit Power	P_o	-9.5	-	-3	dBm	3
Optical Transmit Power	P_o	-5	-	0	dBm	4
Optical Transmit Power	P_o	-3	-	+2	dBm	5
Optical Transmit Power	P_o	0	-	+5	dBm	6
Output Center Wavelength	λ	1280	1310	1340	nm	7
Output Center Wavelength	λ	1520	1550	1580	nm	8
Side Mode Suppression Ratio	Sr	30	35	-	dB	9
Output Spectrum Width	$\Delta\lambda$	-	-	1	nm	10
Extinction Ratio	ER	9	-	-	dB	
Output Eye		Compliant with IEEE 802.3				
Optical Rise/Fall Time	t_r /t_f	-	-	0.26	ns	11
Relative Intensity Noise	RIN	-	-	-120	dB/Hz	
Total Jitter	T_J	-	-	0.27	ns	12

Note 3: C-1x-1250(C)-TDFB(3)-SSC
Note 4: C-1x-1250(C)-TDFB(3)-SSC2
Note 5: C-1x-1250(C)-TDFB(3)-SSC3
Note 6: C-1x-1250(C)-TDFB(3)-SSC4
Note 7: C-13-1250(C)-TDFB(3)-SSC(2/3/4)
Note 8: C-15-1250(C)-TDFB(3)-SSC(2/3/4)
Note 9: CW, Po=5mW
Note 10: -20 dB width
Note 11: 20% to 80% Values
Note 12: Measured with 2^7-1 PRBS

Table 4 – Transmitter Specifications (Electrical)

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Power Supply Current	I_{CC}	-	-	180	mA	13
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	14
Data Input Voltage-High	V_{IH}-V_{CC}	-1.1	-	-0.74	V	

Note 13: Maximum current is specified at V_{CC} = Maximum @ maximum temperature
Note 14: These inputs are compatible with 10K, 10KH and 100K ECL and PECL inputs

Table 5 – Receiver Specifications (Optical)

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Sensitivity	-	-	-	-24	dBm	15
Maximum Input Power	P_{in}	-3	-	-	dBm	
Signal Detect-Asserted	Pa	-	-	-24	dBm	16
Signal Detect-Deasserted	Pd	-38	-	-	dBm	17
Signal Detect-Hysteresis	-	1	-	-	dB	
Wavelength of Operation		1100	-	1620	nm	

Note 15: Measured with 2^7-1 PRBS, 10^{-12} BER.

Note 16: Measured on transition: low to high.

Note 17: Measured on transition: high to low.

Table 6 – Receiver Specifications (Electrical)

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Power Supply Current	I_{CC}	-	-	100	mA	18
Data Output Voltage-Low	V_{OL}-V_{CC}	-2	-	-1.58	V	19
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	20
Signal Detect Output Voltage-High	V_{SDH}-V_{CC}	-1.1	-	-0.74	V	
Signal Detect Output Voltage-Low	V_{SDL}	-	-	0.5	V	21
Signal Detect Output Voltage-High	V_{SDH}	2.0	-	-	V	

Note 18: The current excludes the output load current

Note 19: These outputs are compatible with 10K, 10KH and 100K ECL and LVPECL outputs.

Note 20: C-1x-1250-TDFB(3)-SSC(2/3/4)

Note 21: C-1x-1250C-TDFB(3)-SSC(2/3/4)

Connection Diagram

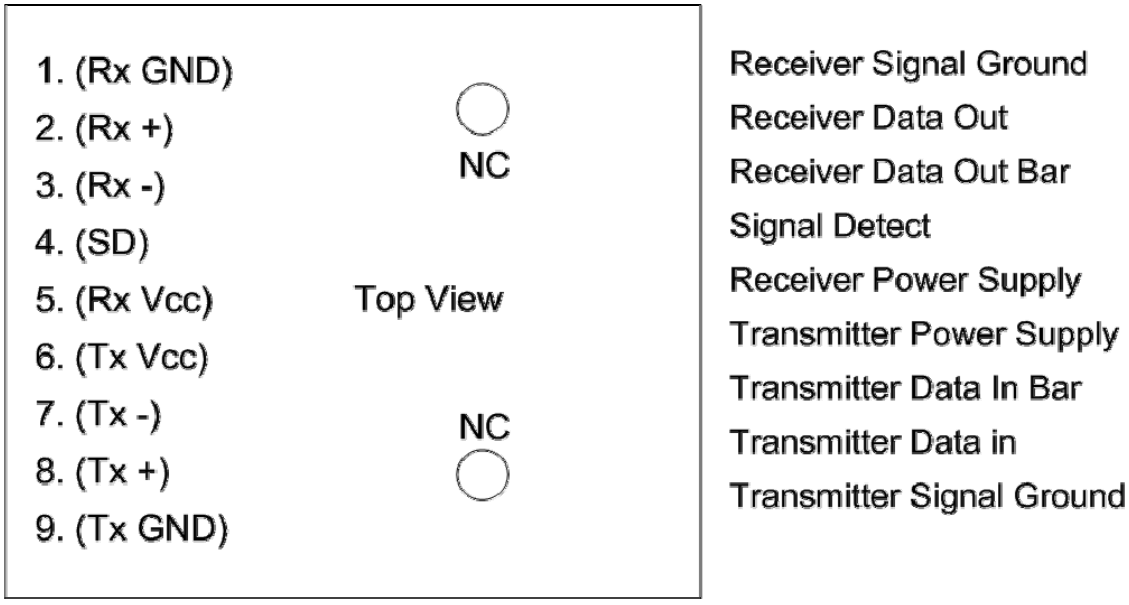
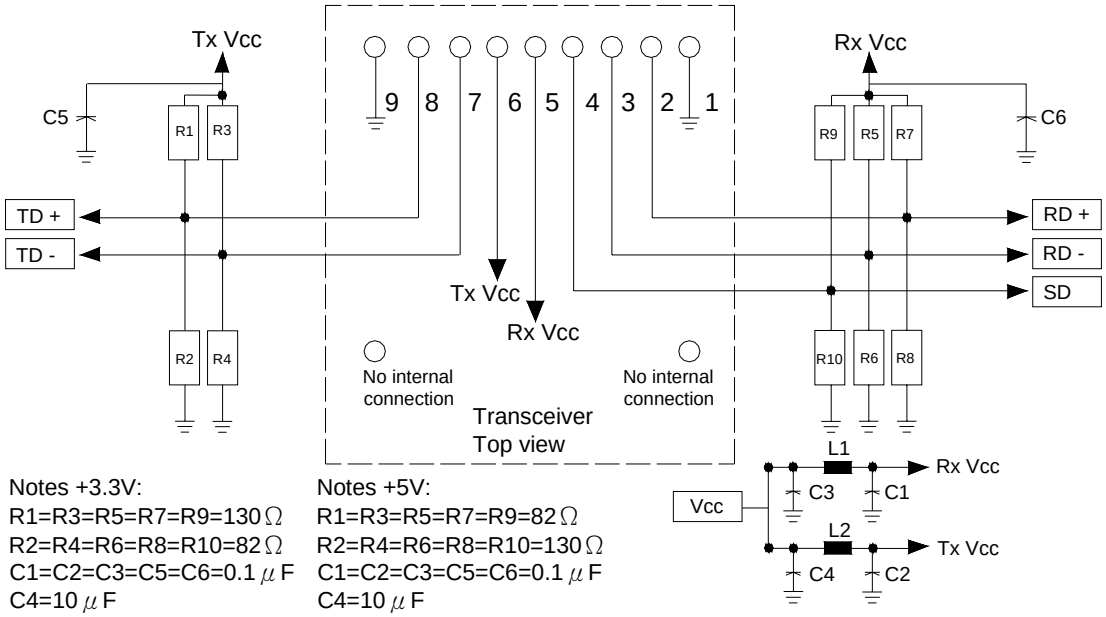


Table 7 – Pin Definitions

Pin	Unit	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 section
5	RxV_{CC}	DC power for the receiver section
6	TxV_{CC}	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

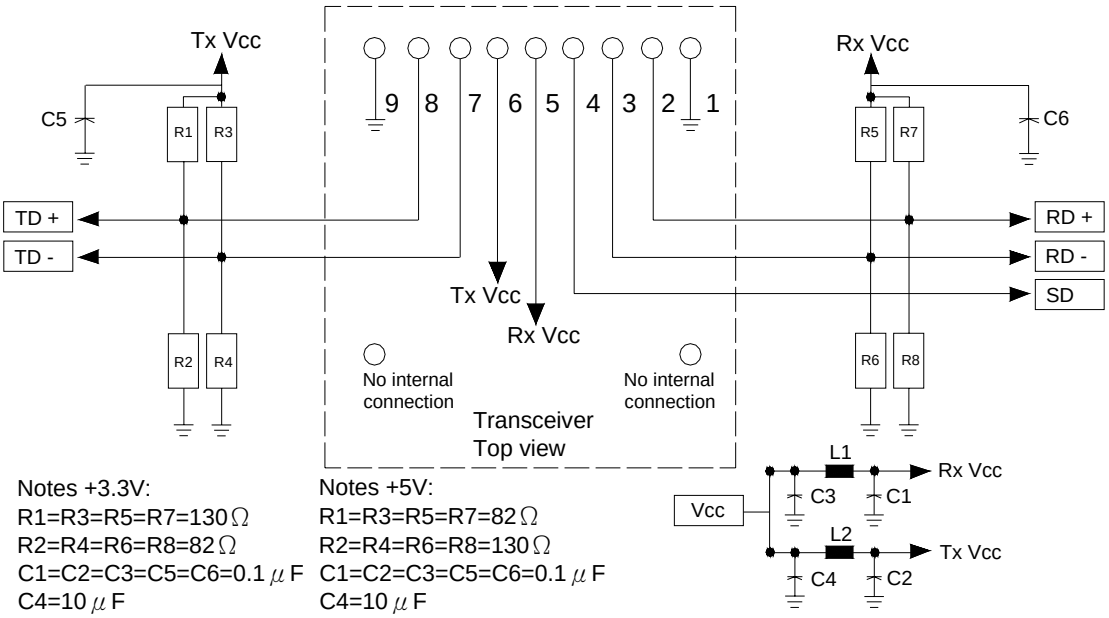
C-1x-1250-TDFB(3)-SSC2(3/4)



Notes +3.3V:
R1=R3=R5=R7=R9=130Ω
R2=R4=R6=R8=R10=82Ω
C1=C2=C3=C5=C6=0.1μF
C4=10μF
L1=L2=1μH

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

C-1x-1250C-TDFB(3)-SSC2(3/4)



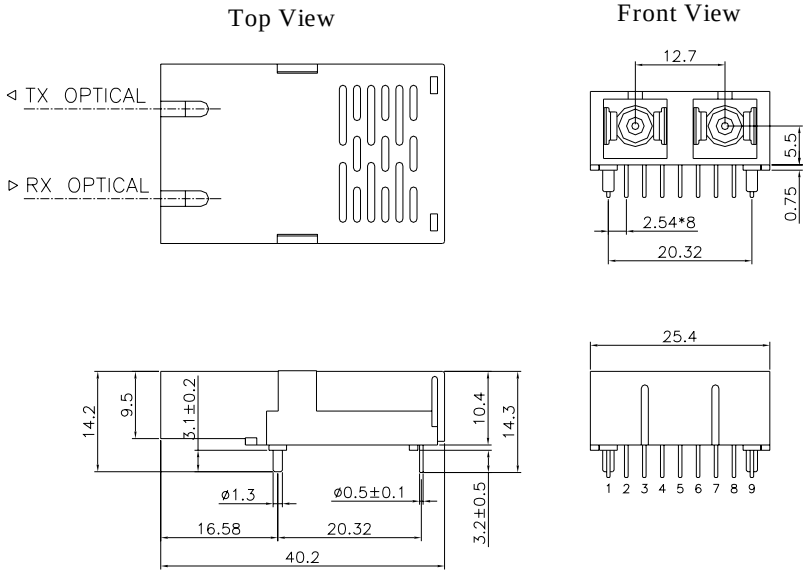
Notes +3.3V:
R1=R3=R5=R7=130Ω
R2=R4=R6=R8=82Ω
C1=C2=C3=C5=C6=0.1μF
C4=10μF
L1=L2=1μH

Notes +5V:
R1=R3=R5=R7=82Ω
R2=R4=R6=R8=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. / Tx Vcc.
A GND plane under the module is required for good EMI and sensitivity performance.

Package Diagram (10.4 mm SC transceiver assembly)

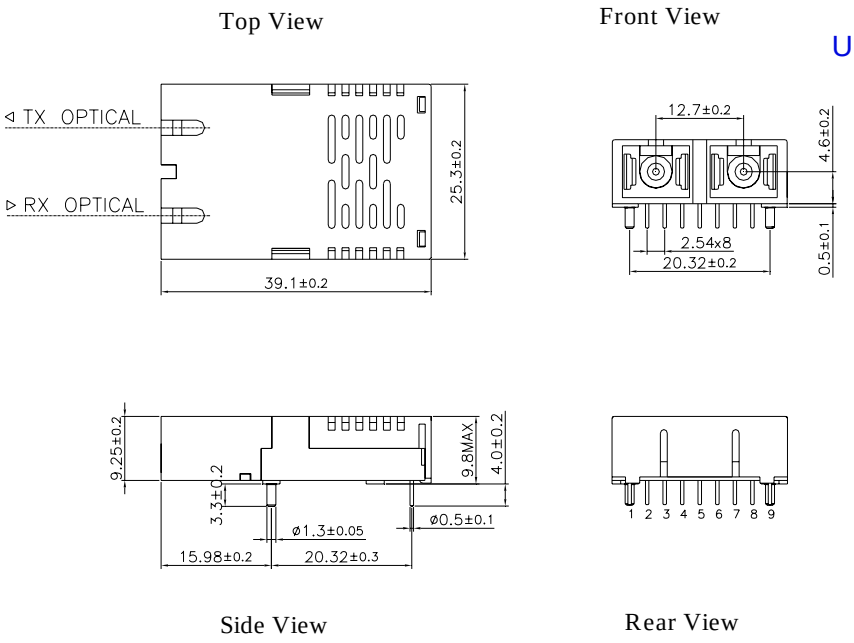
Units: mm



Blank/A: Black case

Package Diagram (9.8 mm SC transceiver assembly)

Units: mm



B / E: Blue case
C / D: Black case

Order Information

Table 8 – Order Information

Part No.	Part No.
C-13-1250(C)-TDFB-SSC(D/E)-G5	C-13-1250(C)-TDFB-SSC3(D/E)-G5
C-13-1250(C)-TDFB3-SSC(D/E)-G5	C-13-1250(C)-TDFB3-SSC3(D/E)-G5
C-15-1250(C)-TDFB-SSC(D/E)-G5	C-15-1250(C)-TDFB-SSC3(D/E)-G5
C-15-1250(C)-TDFB3-SSC(D/E)-G5	C-15-1250(C)-TDFB3-SSC3(D/E)-G5
C-13-1250(C)-TDFB-SSC2(A/B/C/D/E)-G5	C-13-1250(C)-TDFB-SSC4(A/B/C/D/E)-G5
C-13-1250(C)-TDFB3-SSC2(A/B/C/D/E)-G5	C-13-1250(C)-TDFB3-SSC4(A/B/C/D/E)-G5
C-15-1250(C)-TDFB-SSC2(A/B/C/D/E)-G5	C-15-1250(C)-TDFB-SSC4(A/B/C/D/E)-G5
C-15-1250(C)-TDFB3-SSC2(A/B/C/D/E)-G5	C-15-1250(C)-TDFB3-SSC4(A/B/C/D/E)-G5

Part Numbering Definition:

C - 1x - 1250(C) - TDFB(3) - S SC TxPower Temperature and Package -RoHS

- **Wavelength:**
  13= Wavelength 1310 nm
  15= Wavelength 1550 nm
- **Communication Protocol**
  (1250 Mbps)
  1250 = PECL Signal Detection Output
  1250C = TTL Signal Detection Output
- **DFB Laser Transceiver**
  TDFB = +5V Transceiver, DFB
  TDFB3= +3.3V Transceiver, DFB
- **Single Mode Fiber**
- **Connector Options**
- **Tx Power Range**
  Blank = -9.5 to -3 dBm
  2 = -5 to 0 dBm
  3 = -3 to +2 dBm
  4 = 0 to +5 dBm
- **Temperature Range and Package**
  Blank = Commercial Temperature(0 to 70 °C), 10.4 mm, Black case
  A = industrial temperature(-40 to 85 °C), 10.4 mm, Black case
  B = industrial temperature(-40 to 85 °C), 9.8 mm, Blue case
  C = industrial temperature(-40 to 85 °C), 9.8 mm, Black case
  D = commercial temperature(0 to 70 °C), 9.8 mm, Black case
  E = commercial temperature(0 to 70 °C), 9.8 mm, Blue case
- **RoHS**
  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.

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