622 Mbps Single Mode Transceiver

C-13-622-T(3)-SFC

Features

- FC Duplex Single Mode Transceiver
- Industry Standard 1x9 Footprint
- Complies with SONET OC-12 SDH STM-4
- Single +3.3V/+5V Power Supply
- OperatingTemperature Range: 0 to 70°C
- LVPECL/PECL Differential Inputs and Outputs
- LVPECL/PECL Signal Detection Output
- Wave Solderable and Aqueous Washable
- Uncooled laser diode with MQW structure
- Complies with Telcordia (Bellcore) GR-468-CORE
- SONET OC-12 Application
- RoHS compliance available

Absolute Maximum Rating

Parameter	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V_{cc}	0	3.6	V	C-13-622-T3-SFC
Power Supply Voltage	V_{cc}	0	6	V	C-13-622-T-SFC
Output Current	I_{out}	0	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	Note
Power Supply Voltage	V_{cc}	3.1	3.3	3.5	V	C-13-622-T3-SFC
Power Supply Voltage	V_{cc}	4.75	5	5.25	V	C-13-622-T-SFC
Operating Temperature (Case)	T_{opr}	0	-	70	°C	
Data Rate	-	-	622	-	Mbps	

Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Optical Transmit Power	P_o	-15	-	-8	dBm	C-13-622-T(3)-SFC
Optical Transmit Power	P_o	-3	-	+2	dBm	C-13-622-T(3)-SFC4
Output center Wavelength	λ_p	1274	1310	1356	nm	
Output Spectrum Width	$\Delta\lambda_{rms}$	-	-	2.5	nm	RMS(σ)
Extinction Ratio	ER	8.2	-	-	dB	
Output Eye		Compliant with ITU-T G.957/STM-4 Eye Mask				
Optical Rise Time	t_r	-	-	1.2	ns	10% to 90% Values
Optical Fall Time	t_f	-	-	1.2	ns	10% to 90% Values
Relative Intensity Noise	RIN	-	-	-120	dB/Hz	
Total Jitter	TJ	-	-	0.55	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						
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	

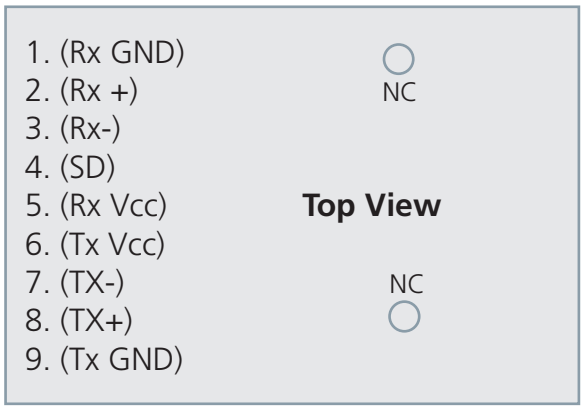
Receiver Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Sensitivity	-	-	-	-28	dBm	Measured with 2^{23}-1 PRBS,BER= 10^{-10}
Maximum Input Power	P_{in}	-3	-	-	dBm	
Signal Detect-Asserted	Pa	-	-	-28	dBm	Measured on transition: low to high
Signal Detect-Deasserted	Pd	-40	-	-	dBm	Measured on transition: high to low
Signal Detect-Hysteresis		1	-	5	dB	
Wavelength of Operation		1100	-	1600	nm	

Receiver Specifications

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	-	-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

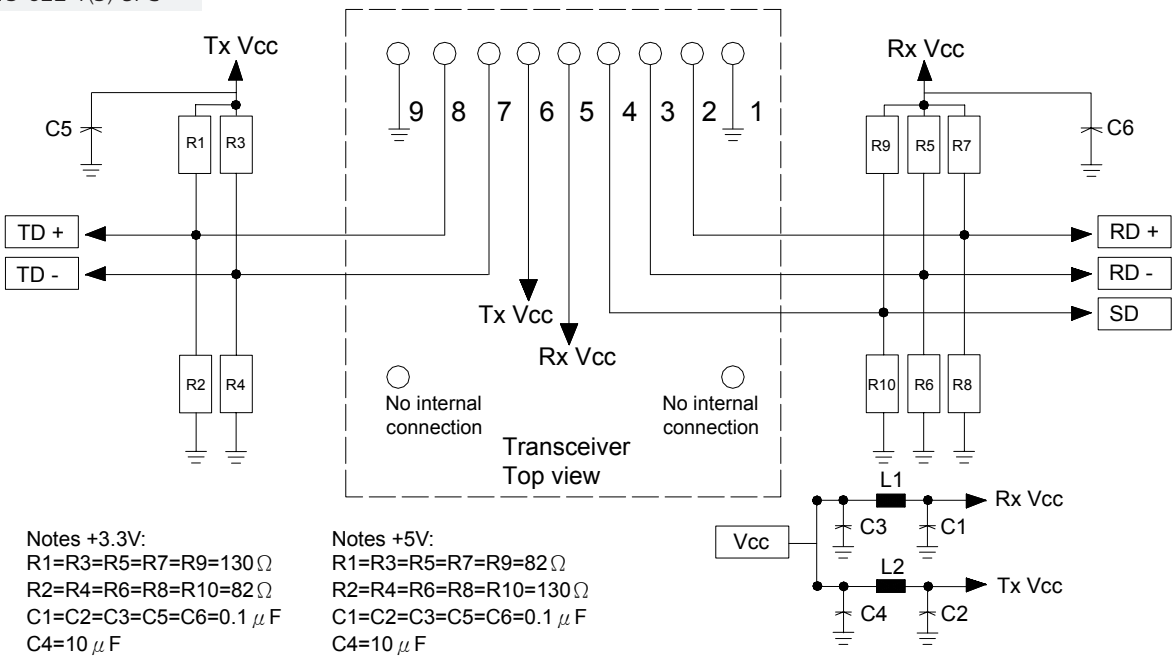


Receiver Signal Ground
Receiver Data Out
Receiver Data Out Bar
Signal Detect
Receiver Power Supply
Transmitter Power Supply
Transmitter Data In Bar
Transmitter Data in
Transmitter Signal Ground

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	DC power for the receiver section
6	TxVcc	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-13-622-T(3)-SFC

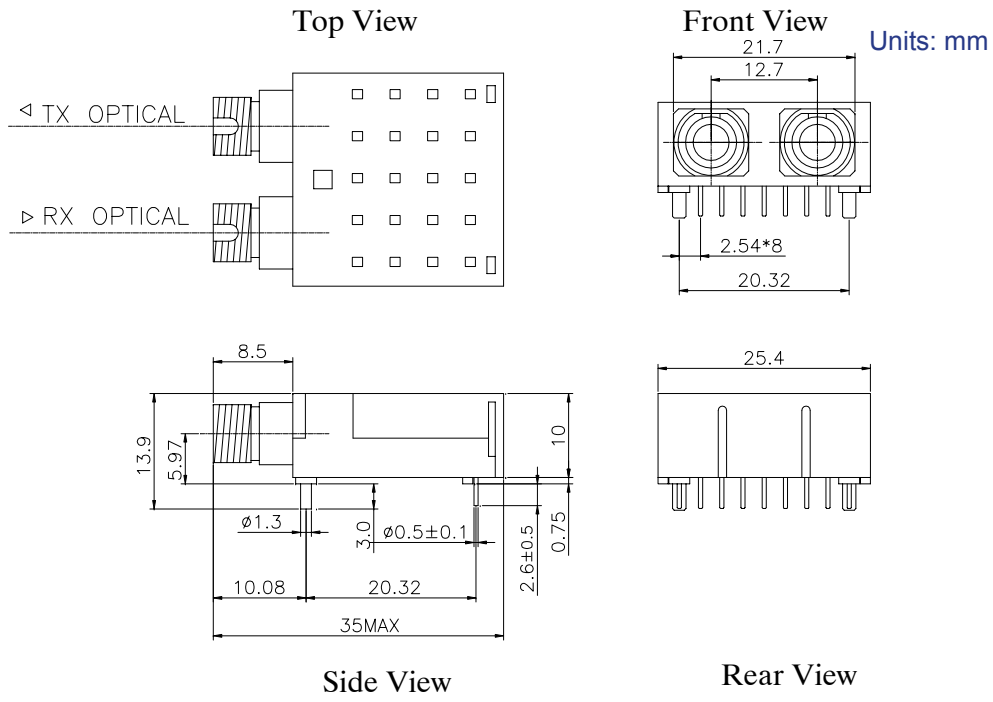


Notes +3.3V:
R1=R3=R5=R7=R9=130Ω
R2=R4=R6=R8=R10=82Ω
C1=C2=C3=C5=C6=0.1 μF
C4=10 μF
L1=L2=1 μH

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

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



Ordering Information

Available Options:

C-13-622-T3-SFC	C-13-622-T3-SFC4
C-13-622-T-SFC	C-13-622-T-SFC4
C-13-622-T3-SFC-G5	C-13-622-T3-SFC4-G5
C-13-622-T-SFC-G5	C-13-622-T-SFC4-G5

Part unmbering Definition:

C - 13 - 622 - T(3) - S FC Tx Power -RoHS

- **Wavelength**
  13= 1310 nm
- **Communication protocol**
  (622 Mbps)
- **T3 = +3.3V Transceiver, FP**
  T = +5V Transceiver, FP
- **Single mode fiber**
- **Connector options**
- **Tx Power range**
  Blank = -15 to -8 dBm
  4 = -3 to +2 dBm
- **Ordering Information**
  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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