Luminent
Bringing Communications to Light™

622 Mbps Singlemode Transceiver
Preliminary

C-13-622(C) –T-SSC • C-13-622(C) –T-SSC4 • C-13-622(C) –TDFB-SSC4 • C-15-622(C) –TDFB-SSC4

Features

- SC Duplex SingleMode Transceiver
- Industry Standard 1 x 9 Footprint
- Complies with SONET OC-12 SDH STM-4
- Single +5V Power Supply
- Operating Temperature Range 0˚C to +70˚C
- PECL Differential Inputs and Outputs
- PECL Signal Detection Output (C-1X-622-TX-SSCX)
- TTLSignal Detection Output (C-1X-622C-TX-SSCX)
- Wave Solderable and Aqueous Washable
- Uncooled laser diode with MQW structure
- Complies with Bellcore TA-NWT-000983

Applications

- SONET OC-12

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
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
Operating Temperature	T_{opr}	0	+70	˚C
Storage Temperature	T_{stg}	-40	+85	˚C

*10 seconds on leads only

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	-	-	622	-	Mbps

Transmitter Specifications ($0°C < T_{opr} < 70°C$, $4.75\ V < V_{cc} < 5.25\ V$)

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Optical						
Optical Transmit Power	P_o	-14	-	-7	dBm	C-13-622(C)-T-SSC
Optical Transmit Power	P_o	-3	-	2	dBm	C-1X-622(C)-TX-SSC4
Output Center Wavelength	λ_c	1274	1310	1356	nm	C-13-622(C)-T-SSC
Output Center Wavelength	λ_c	1296	1310	1330	nm	C-13-622(C)-T-SSC4
Output Center Wavelength	λ_c	1280	1310	1335	nm	C-13-622(C)-TDFB-SSC4
Output Center Wavelength	λ_c	1480	1550	1580	nm	C-15-622(C)-TDFB-SSC4
Output Spectrum Width	$\Delta\lambda_{rms}$	-	-	2.5	nm	RMS (σ), C-13-622(C)-T-SSC
Output Spectrum Width	$\Delta\lambda_{rms}$	-	-	1.7	nm	RMS (σ), C-13-622(C)-T-SSC4
Output Spectrum Width	$\Delta\lambda$	-	-	1	nm	-20 dB width, C-1X-622(C)-TDFB-SSC4
Side Mode Suppression Ratio	Sr	30	35	-	dB	CW, P_o = 5 mW, C-1X-622(C)-TDFB-SSC4
Extinction Ratio	E_R	8.2	-	-	dB	C-13-622(C)-T-SSC
Extinction Ratio	E_R	10	-	-	dB	C-1X-622(C)-TX-SSC4
Output Eye	Compliant with ITU-T G.957/STM-4 Eye Mask					
Optical Rise Time	t_r	-	-	1.2	ns	10%-90% Values
Optical Fall Time	t_f	-	-	1.2	ns	10%-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.
Electrical						
Power Supply Current	I_{cc}	-	-	180	mA	Maximum current is specified at V_{cc}=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	-	-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	

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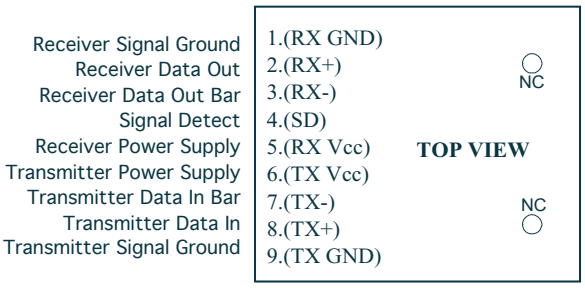
Receiver Specifications ($0°C < T_{opr} < 70°C$, $4.75\ V < V_{cc} < 5.25\ V$)

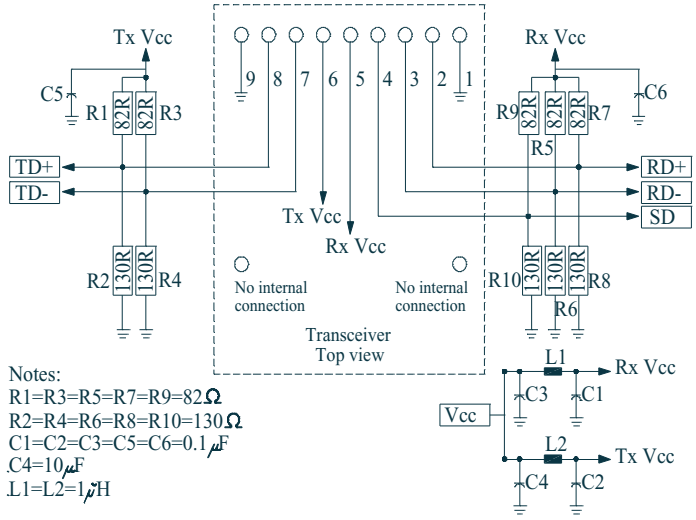
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Optical						
Sensitivity	-	-		-28	dBm	Measured with 2^{23}-1 PRBS, BER=10^{-10}
Maximum Input Power	P_{in}	-3			dBm	
Signal Detect – Asserted	P_a	-		-28	dBm	Measured on transition: low to high
Signal Detect –Deasserted	P_d	-40		-	dBm	Measured on transition: high to low
Signal detect –Hysteresis		1		5	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_{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}			0.5	V	
Signal Detect Output Voltage - High	V_{SDH}	2.0			V	C-1X-622C-TX-SSCX
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	C-1X-622-TX-SSCX

Connection Diagram



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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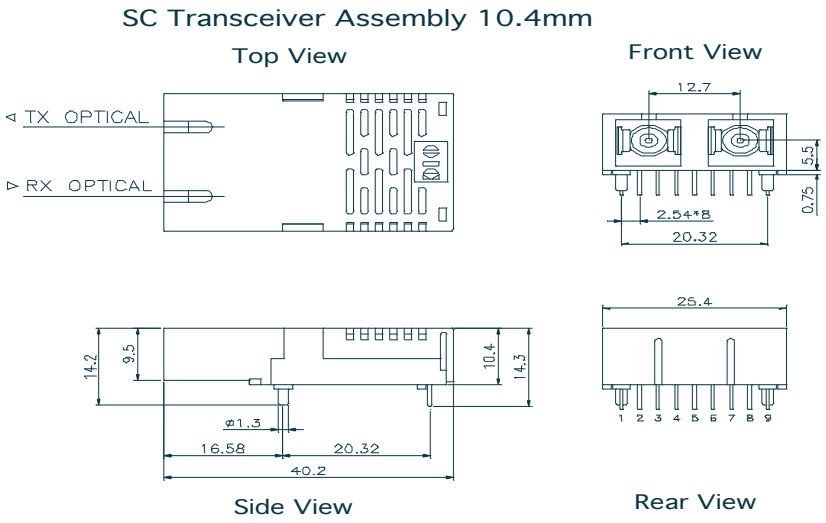
Package Diagram (All units in mm)



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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