Luminent
Bringing Communications to Light™

2.5 Gbps Singlemode SFF LC Transceiver

C-13-2500/C-F-SLC • C-13-2500/C-FDFB-SLC2 • C-15-2500/C-FDFB-SLC2

Features

- Duplex LC Singlemode Transceiver
- Small Form Factor Multi-sourced 2 x 5 Pin Package
- Complies with SONET SR/SDH STM 16 (I-16 / S-16.1 / S-16.2)
- 1310 nm / 1550 nm Wavelength, FP / DFB Laser
- Single +3.3 V Power Supply
- LVPECL/CML Differential level Inputs and Outputs
- LVTTL Signal Detection Output (C-1X 2500C-FX-SLCX)
- LVPECL Signal Detection Output (C 1X-2500-FX-SLCX)
- LVTTL disable input
- Temperature Range: 0 to +70°C
- Class 1 Laser International Safety Standard IEC 825 Compliant
- Solderability to MIL-STD-883, Method 2003
- Pin coating is Sn / Pb with minimum 2% Pb content
- Flammability to UL94V0
- Humidity RH 5-85% (5-95% short term) to IEC 68-2-3
- Complies with Bell core TA-NWT-000983
- Uncooled laser diode with MQW structure

Applications

- SONET OC-48

Absolute Maximum Ratings (T_c=25°C)

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	V_{cc}	0	3.6	V
Data Input Voltage		GND	V_{cc}	V
Soldering Temperature*			260	˚C
Storage Temperature	T_{stg}	-40	85	˚C

*Note: 10 seconds on leads only

Recommended Operating Conditions

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	-	-	2488	-	Mbps

Transmitter Specifications (0°C < T_{opr} < 70°C, 3.1 V < V_{cc} < 3.5 V)

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Optical						
Optical Transmit Power	P_o	-10	-	-3	dBm	C-13-2500/C-F-SLC
Optical Transmit Power	P_o	-5	-	0	dBm	C-1X-2500/C-FDFB-SLC2
Output Center Wavelength	λc	1266	1310	1360	nm	C-13-2500/C-F-SLC
Output Center Wavelength	λc	1260	1310	1360	nm	C-13-2500/C-FDFB-SLC2
Output Center Wavelength	λc	1430	1550	1580	nm	C-15-2500/C-FDFB-SLC2
Output Spectrum Width	$\Delta\lambda_{rms}$	-	-	4	nm	RMS (σ), C-13-2500/C-F-SLC
Output Spectrum Width	$\Delta\lambda_{rms}$	-	-	1	nm	-20 dB width, C-1X-2500/C-FDFB-SLC2
Side Mode Suppression Ratio	Sr	30	35	-	dB	CW, P_o = 5 mW, C-1X-2500/C-FDFB-SLC2
Extinction Ratio	E_R	8.2	-	-	dB	
Output Eye	Compliant with Bellcore TR-NWT-000253 and ITU recommendation G.957 STM-16					
Optical Rise Time	t_r	-	130	-	ps	20%-80% Values
Optical Fall Time	t_f	-	130	-	ps	20%-80% Values
Electrical						
Power Supply Current	I_{cc}	-	-	160	mA	Maximum current is specified at V_{cc}=Maximum @ maximum temperature.
Transmit Enable Voltage	V_{EN}	0	-	0.8	V	
Transmitter Disable Voltage	V_D	2	-	V_{cc}	V	
Data Input Voltage-Low	V_{IL}-V_{CC}	-1.82	-	-1.48	V	Terminated by 50Ω to V_{cc} –2V
Data Input Voltage-High	V_{IH}-V_{CC}	-1.16	-	-0.89	V	Terminated by 50Ω to V_{cc} –2V
Data Input Voltage (CML)-Differential	V_I	400	-	1600	mV_{p-p}	AC coupled inputs
Data Input Voltage (CML)-Single Ended	V_I	200	-	800	mV_{p-p}	AC coupled inputs

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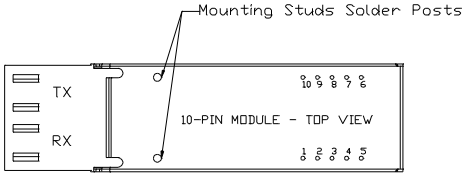
Receiver Specifications (0°C < T_{opr} < 70°C, 3.1 V < V_{cc} < 3.5 V)

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Optical						
Sensitivity	-	-	-20	-18	dBm	Measured with 2^{23}-1 PRBS, BER=10^{-10}
Maximum Input Power	P_{in}	-3	-	-	dBm	C-13-2500/C-F-SLC
Maximum Input Power	P_{in}	0	-	-	dBm	C-1X-2500/C-FDFB-SLC2
Signal Detect-Asserted	P_a	-	-	-18	dBm	Measured on transition: low to high
Signal Detect-Deasserted	P_d	-30	-	-	dBm	Measured on transition: high to low
Signal detect-Hysteresis	P_a-P_d	1	4	6	dB	
Wavelength of Operation		1100	-	1600	nm	
Electrical						
Power Supply Current	I_{cc}	-	-	130	mA	The current excludes the output load current
Data output Voltage-Low	V_{OL}-V_{CC}	-1.82	-	-1.48	V	Terminated by 50 Ω to Vcc–2V
Data output Voltage-High	V_{OH}-V_{CC}	-1.16	-	-0.89	V	Terminated by 50 Ω to Vcc–2V
Data output Voltage (CML)-Single Ended		250	-	500	mV_{p-p}	AC coupled outputs
Data output Voltage (CML)-Differential		500	-	1000	mV_{p-p}	AC coupled outputs
Signal Detect Output Voltage-Low	V_{SDL}	-	-	0.5	V	C-1X-2500C-FX-SLCX
Signal Detect Output Voltage-High	V_{SDH}	2.4	-	-	V	
Signal Detect Output Voltage-Low	V_{SDL}-V_{CC}	-1.9	-	-1.58	V	C-1X-2500-FX-SLCX 510Ω terminated to GND
Signal Detect Output Voltage-High	V_{SDH}-V_{CC}	-1.2	-	-0.82	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 (LVTTL or LVPECL)
4	RD-	Receiver Data Out Bar (LVPECL / CML)
5	RD+	Receiver Data Out (LVPECL / CML)
6	TxVcc	+3.3V dc power for the transmitter section
7	TxGND	Directly connect this pin to the transmitter ground plane
8	TxDIS	Transmitter disable (LVTTL)
9	TD+	Transmitter Data In (LVPECL / CML)
10	TD-	Transmitter Data In Bar (LVPECL / CML)
Attaching Posts		The attaching posts are at case potential and may be connected to chassis ground. They are isolated from circuit ground.

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Recommended Circuit Schematics

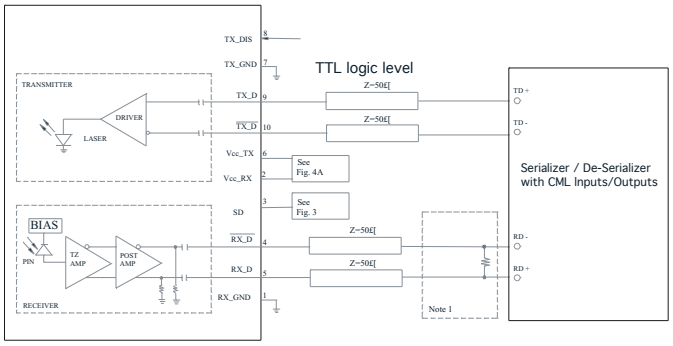


Figure 1. Recommended TRANSMIT and RECEIVE Data Terminations for SERDES with CML I/Os.
Note 1. Consult SERDES manufacturer's data sheet and application data for appropriate receiver input biasing network.
Some deserializer inputs are internally terminated and may not need external termination resistors.

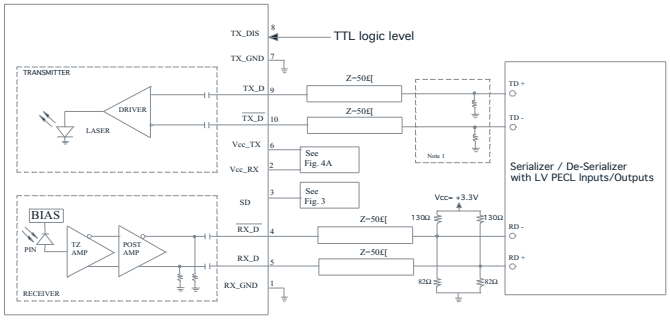
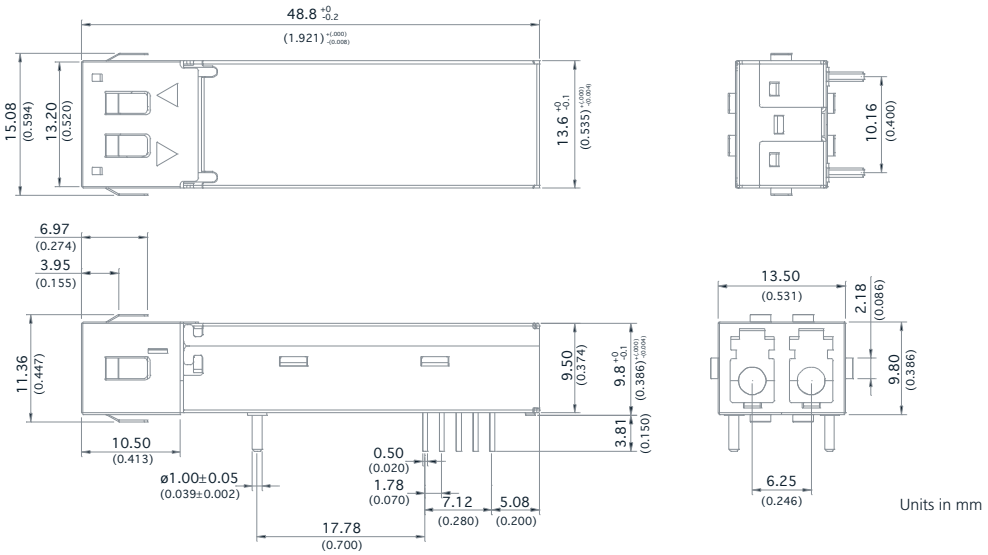


Figure 2. Recommended TRANSMIT and RECEIVE Data Terminations for SERDES with LV PRCL I/Os.
Note 1. Consult SERDES manufacturer's application information for biasing required for Tx outputs. Some serializer outputs are internally biased and may not need external bias resistors.

Package Diagram

Case with EMI Shielding Finger



Note: This singlemode transceiver is a class I laser product. it complies with IES 825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical parts of the module will terminate with an optical connector or with a dust plug.

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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