

B-13/15-622-TPM(3)-SXX4(A)-60



Features

- Coaxial single mode single fiber package with optional SC/FC/ST/MU connector
- Wavelength Tx 1310 nm/Rx 1550 nm
- SONET OC-12 SDH STM-4 Compliant
- Single +5V/+3.3V Power Supply
- PECL/LVPECL Differential Inputs and Outputs
- Wave Solderable and Aqueous Washable
- Class 1 Laser Int. Safety Standard IEC 825 Compliant
- Uncooled Laser diode with MQW structure
- Complies with Telcordia (Bellcore) GR-468-CORE
- Optical Isolation > 30 dB
- Cross talk < -33 dB
- Optical Return Loss >14 dB

Absolute Maximum Rating

Parameter	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage (5V)	V _{cc}	0	6	V	B-13/15-622-TPM-SXX4(A)-60
Power Supply Voltage (3.3V)	V _{cc}	0	3.6	V	B-13/15-622-TPM3-SXX4(A)-60
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
Power Supply Voltage (5V)	V _{cc}	4.75	5	5.25	V
Power Supply Voltage (3.3V)	V _{cc}	3.1	3.3	3.5	V
Operating Temperature ¹	T _{opr}	0	-	70	°C
Operating Temperature ¹	T _{opr}	-40	-	85	°C
Data Rate		-	622	-	Mbps

Note 1 : Please refer to ordering information

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Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Optical Transmit Power	P_o	-3	-	+2	dBm	Output power is coupled into a 9/125 μ m single mode fiber
Output Center Wavelength	λ	1260	1310	1360	nm	
Output Spectrum Width	$\Delta\lambda$	-	-	2.5	nm	RMS(σ)
Extinction Ratio	ER	8.2	-	-	dB	
Output Eye		Compliant with Bellcore GR-253-CORE and ITU recommendation G957				
Optical Rise Time	t_r	-	-	1.2	ns	10% to 90% Values
Optical Fall Time	t_f	-	-	1.2	ns	10% to 90% Values
Optical Isolation		30	-	-	dB	Tx: 1310 nm/ Rx: 1550 nm
Optical Return Loss		14	-	-	dB	
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.

Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
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	-	-	μ A	
Data Input Current-High	I_{IH}	-	-	350	μ A	
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	

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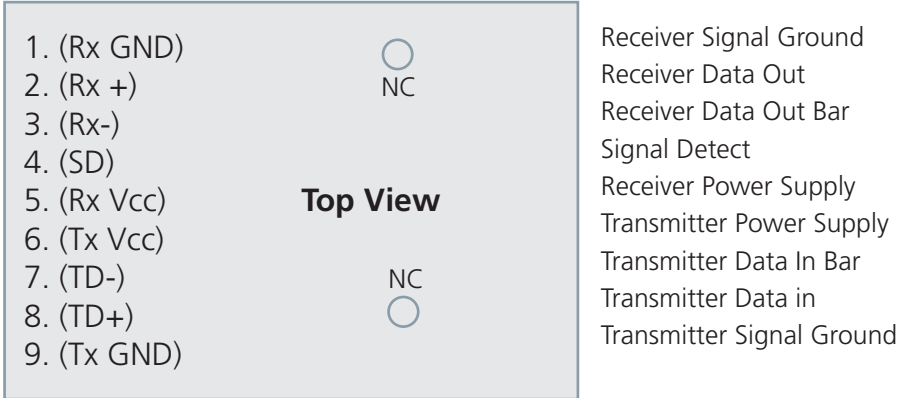
Receiver Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Sensitivity	-	-	-	-28	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	-	-	-28	dBm	Measured on transition: low to high
Signal Detect-Deasserted	P _d	-40	-	-	dBm	Measured on transition: high to low
Signal Detect-Hysteresis		-	3.0	-	dB	
Cross Talk	-	-	-	-33	dB	
Wavelength of Operation		1480	-	1600	nm	

Receiver Specifications

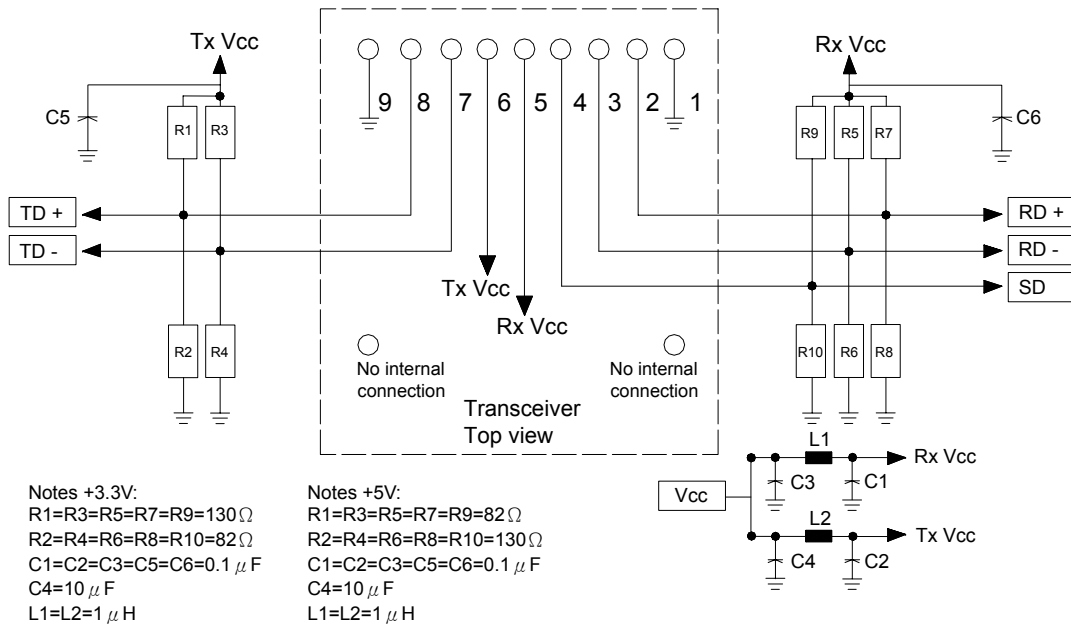
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Electrical						
Power Supply Current	I _{CC}	-	-	100	mA	The current excludes the output load current
Data Output Voltage-Low	V _{OL} -V _{CC}	-1.9	-	-1.6	V	These outputs are compatible with 10K, 10KH and 100KECL and PECL outputs.
Data Output Voltage-High	V _{OH} -V _{CC}	-1.1	-	-0.8	V	
Signal Detect Output Voltage-Low	V _{SDL} -V _{CC}	-1.9	-	-1.6	V	
Signal Detect Output Voltage-High	V _{SDH} -V _{CC}	-1.1	-	-0.8	V	

Connection Diagram



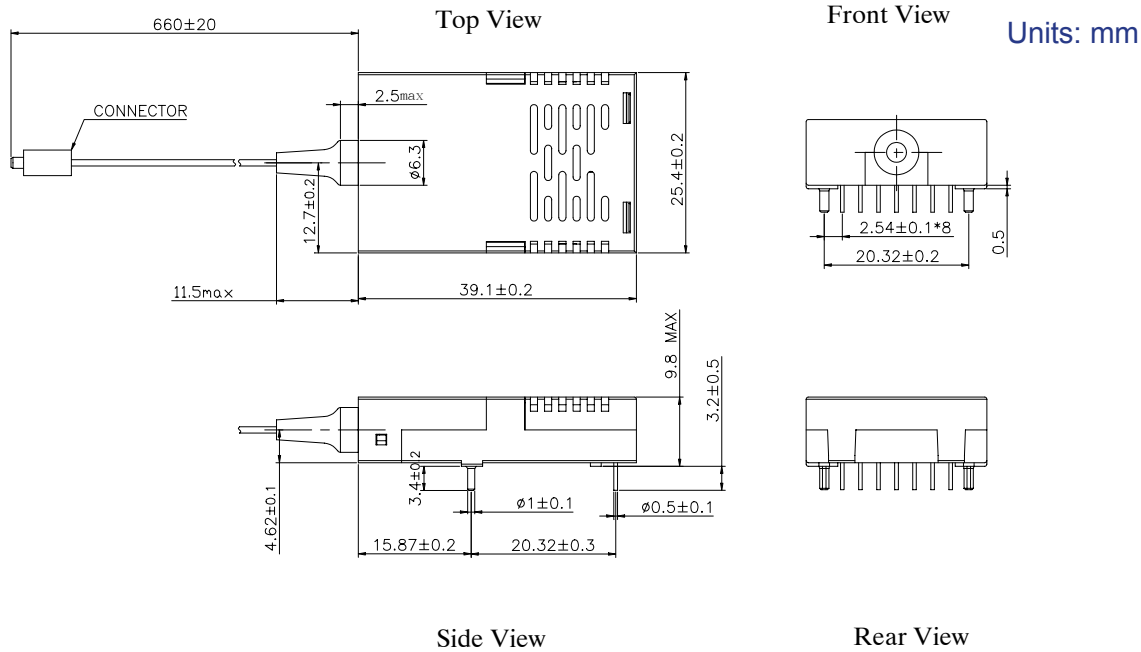
PIN	Symbol	Notes
1	RxGND	Directly connect this pin to the receiver ground plane
2	RD+	See recommended circuit schematic
3	RD-	See recommended circuit schematic
4	SD	Active high on this indicates a received optical signal
5	RxVcc	DC power for the receiver section
6	TxVcc	DC power for the transmitter section
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



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



B-13/15-622-TPM(3)-SXX4(A)-60

Ordering Information

Available Options:

- B-13/15-622-TPM-SSC4(A)-60 B-13/15-622-TPM3-SSC4(A)-60
- B-13/15-622-TPM-SST4(A)-60 B-13/15-622-TPM3-SST4(A)-60
- B-13/15-622-TPM-SFC4(A)-60 B-13/15-622-TPM3-SFC4(A)-60
- B-13/15-622-TPM-SMU4(A)-60 B-13/15-622-TPM3-SMU4(A)-60

Part numbering Definition:

B - 13/15 - 622 - TPM(3) - S XX TxPower Temperature -60

- **Wavelength**
Tx Wavelength=1310nm
Rx Wavelength=1550nm
- **Communication protocol**
(622 Mbps)
- **TPM = +5V Transceiver**
TPM3 = +3.3 V Transceiver
- **Single mode fiber**
- **Connector options**
SC/FC/ST/MU
- **Tx Power range**
4= -3 to +2 dBm
- **Temperature**
Blank = Commercial Temperature (0 to 70°C)
A = Industrial Temperature (-40 to 85°C)
- **-60 : fiber length = 660mm ± 20mm**

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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