

## B-15/13-1250(C)-TDPM3-SXX-60



### Features

- Coaxial single mode single fiber package with optional SC/FC/ST/MU connector
- Wavelength Tx 1550 nm/ Rx 1310nm
- Compliant with IEEE 802.3z Gigabit Ethernet
- Single +3.3V Power Supply
- LVPECL Differential Inputs and Outputs
- LVPECL SD Output (B-15/13-1250-TDPM3-SXX-60)
- LVTTTL SD Output (B-15/13-1250C-TDPM3-SXX-60)
- Wave Solderable and Aqueous washable
- Class 1 Laser Int. Safety Standad IEC 825 Compliant
- Uncooled laser diode with MQW structure
- Complies with Telcordia (Bellcore) GR-468-CORE
- Temperature Range: 0 to 70°C
- Optical Isolation >30 dB
- Cross Talk < -33 dB
- Optical Return Loss > 14dB

### Absolute Maximum Rating

Parameter	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	$V_{CC}$	0	3.6	V	
Output Current	$I_{out}$	-	30	mA	
Soldering Temperature	-	-	260	°C	10 seconds on leads only
Operating Temperature	$T_{opr}$	0	70	°C	
Storage Temperature	$T_{stg}$	-40	85	°C	

### Recommended Operating Condition

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	$V_{CC}$	3.1	3.3	3.5	V
Operating Temperature (Case)	$T_{opr}$	0	-	70	°C
Data Rate	-	-	1250	-	Mbps

### Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Optical</b>						
Optical Transmit Power	$P_o$	-10	-	-4	dBm	Output power is coupled into a 9/125 $\mu$ m single mode fiber
Output center Wavelength	$\lambda$	1500	1550	1600	nm	
Output Spectrum Width	$\Delta\lambda$	-	-	1	nm	-20dB
Side Mode Suppression Ratio	$S_r$	30	35	1	dB	$CW_1 P_0=5mW$
Extinction Ratio	ER	9	-	-	dB	
Output Eye		Compliant with IEEE 802.3z				
Optical Rise Time	$t_r$	-	-	0.26	ns	20% to 80% Values
Optical Fall Time	$t_f$	-	-	0.26	ns	20% to 80% Values
Optical Isolation	-	30	-	-	dB	Tx:1550 nm/ Rx:1310 nm
Optical Return Loss	-	14	-	-	dB	
Relative Intensity Noise	RIN	-	-	-120	dB/Hz	
Total Jitter	TJ	-	-	0.27	ns	Measured with 2 <sup>7</sup> -1

## B-15/13-1250(C)-TDPM3-SXX-60

## Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Electrical</b>						
Power Supply Current	$I_{CC}$	-	-	150	mA	Maximum current is specified at $V_{CC}$ = Maximum @ maximum temperature
Data Input Current-Low	$I_{IL}$	-350	-	-	$\mu$ A	
Data Input Current-High	$I_{IH}$	-	-	350	$\mu$ 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	

## Receiver Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Optical</b>						
Sensitivity	-	-	-	-22	dBm	Measured with $2^7-1$ PRBS, BER $10^{-12}$
Maximum Input Power	$P_{in}$	-3	-	-	dBm	
Signal Detect-Asserted	$P_a$	-	-	-22	dBm	Measured on transition: low to high
Signal Detect-Deasserted	$P_d$	-35	-	-	dBm	Measured on transition: high to low
Signal Detect-Hysteresis	-	-	3.0	-	dB	
Cross Talk	-	-	-	-33	dB	
Wavelength of Operation	-	1260	-	1360	nm	

## Receiver Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Note
<b>Electrical</b>						
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	B-15/13-1250-TDPM3-SXX-60
Signal Detect Output Voltage-High	$V_{SDH}-V_{CC}$	-1.1	-	-0.8	V	
Signal Detect Output Voltage-Low	$V_{SDL}$	-	-	0.5	V	B-15/13-1250C-TDPM3-SXX-60
Signal Detect Output Voltage-High	$V_{SDH}$	2	-	-	V	

Connection Diagram

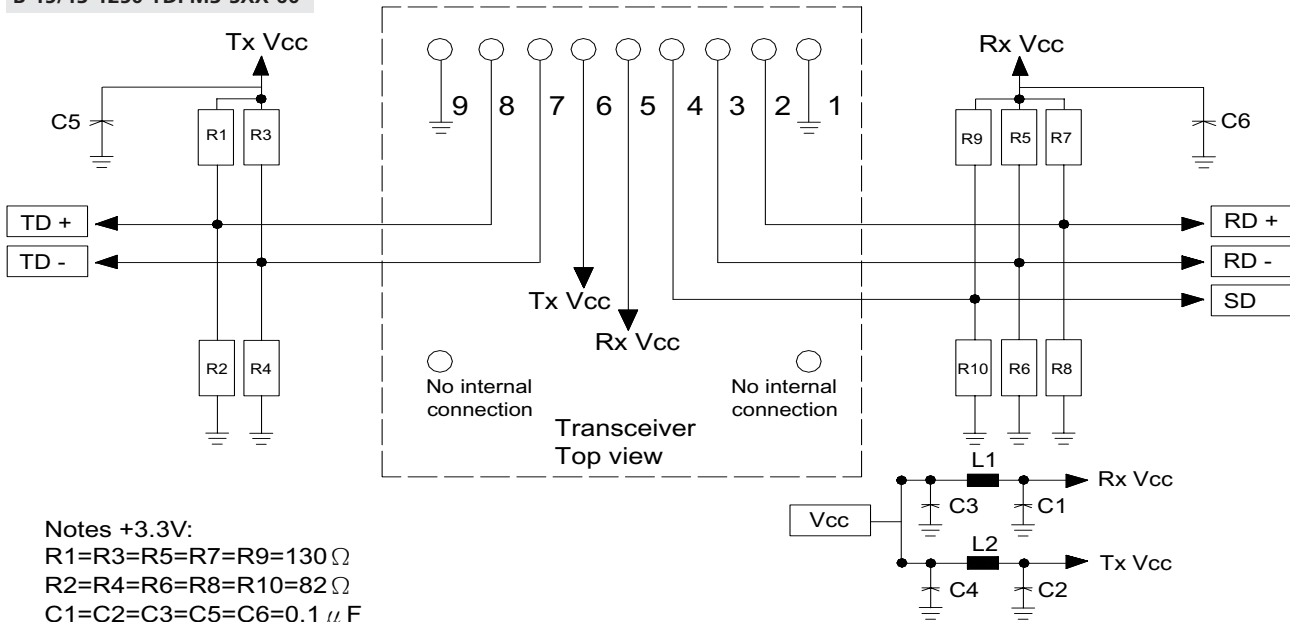


PIN	Symbol	Notes
1	RxGND	Directly connect this pin to the receiver ground plane
2	RD+	See recommended circuit schematic
3	RD-	See recommended circuit schematic
4	SD	Active high on this indicates a received optical signal
5	RxVcc	+3.3V dc power for the receiver section
6	TxVcc	+3.3V dc power for the transmitter section
7	TD-	See recommended circuit schematic
8	TD+	See recommended circuit schematic
9	TxGND	Directly connect this pin to the transmitter ground plane

## B-15/13-1250(C)-TDPM3-SXX-60

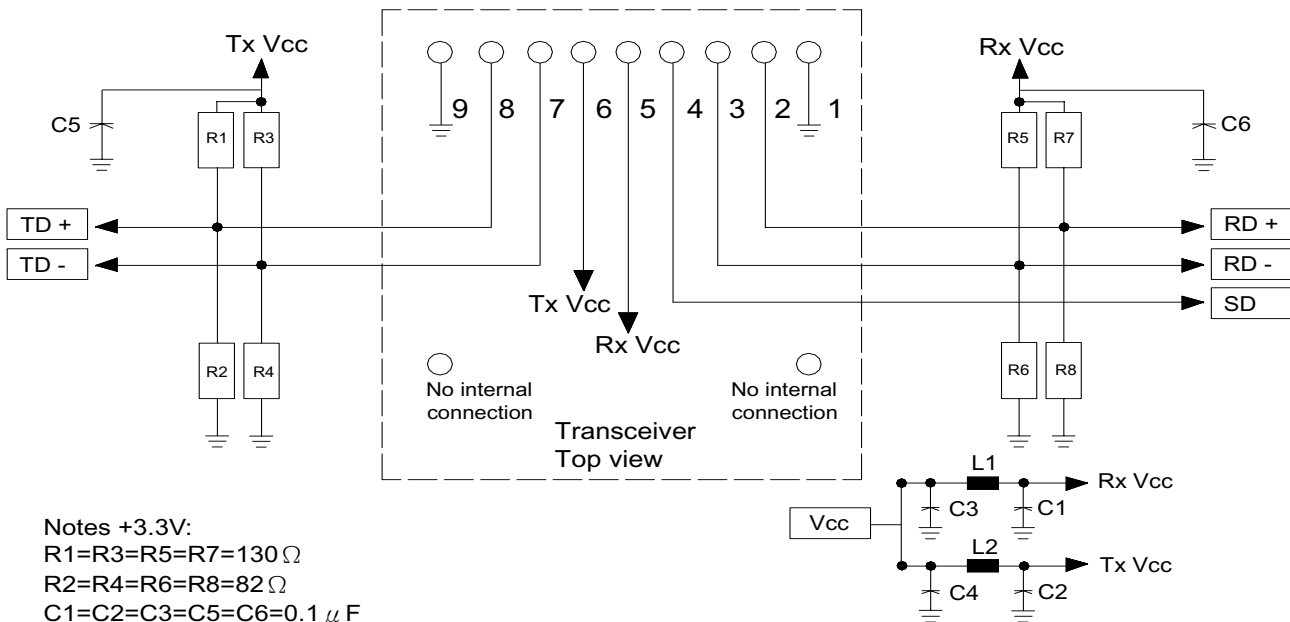
### Recommended Circuit Schematic

#### B-15/13-1250-TDPM3-SXX-60



Notes +3.3V:  
 $R1=R3=R5=R7=R9=130\ \Omega$   
 $R2=R4=R6=R8=R10=82\ \Omega$   
 $C1=C2=C3=C5=C6=0.1\ \mu F$   
 $C4=10\ \mu F$   
 $L1=L2=1\ \mu H$

#### B-15/13-1250C-TDPM3-SXX-60

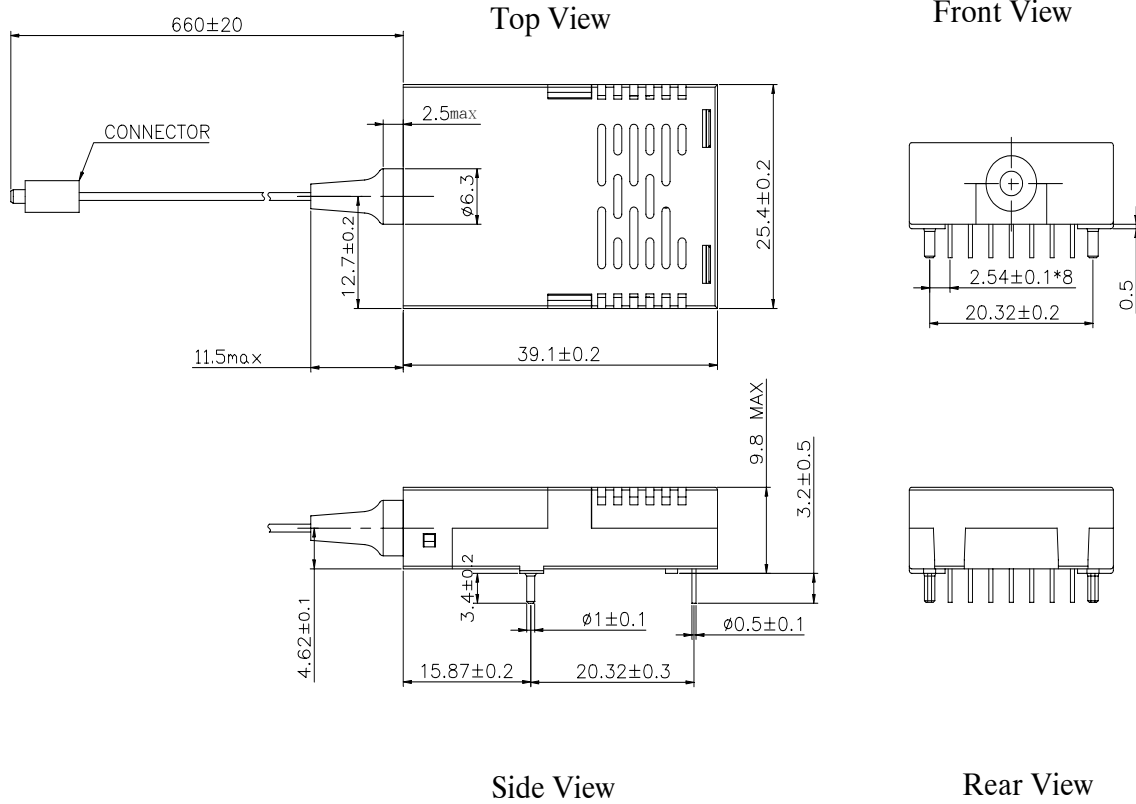


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The split-loaded terminations for ECL signals need to be located at the input of devices receiving those ECL signals. The power supply filtering is required for good EMI performance. Use short tracks from the inductor L1/L2 to the module Rx Vcc. A GND plane under the module is required for good EMI and sensitivity performance.

Package Diagram

## Diplexer Transceiver Assembly



Units in mm (inch)

## Ordering Information

**Available Options:**

- B-15/13-1250(C)-TDPM3-SSC-60
- B-15/13-1250(C)-TDPM3-SST-60
- B-15/13-1250(C)-TDPM3-SFC-60
- B-15/13-1250(C)-TDPM3-SMU-60

**B - 15/13 - 1250(C) - TDPM3 - S XX -60**

- **Wavelength**
  - Tx Wavelength=1550nm
  - Rx Wavelength=1310nm
- **Communication protocol**
  - (1250 Mbps)
  - 1250=LVPECL Signal Detection Output
  - 1250C=LVTTTL Signal Detection Output
- **+3.3 V Transceiver**
- **Single mode fiber**
- **Connector options**
  - (SC/ST/FC/MU)
- **Length of Pigtail Fiber**
  - = 660 ± 20 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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