

## MAGNUM SERIES

SIZE 8 CAVITY OPTOELECTRONIC PCB INSERT, REAR RELEASE,  
850 NM - ARINC 818, 801, 803 AND 804 COMPLIANT



Magnum series Optoelectronic size 8 cavity PCB insert transmitters consist of optoelectronic transmitter functions integrated into a printed circuit board mounted pin contact. The optical transmitters are 850 nm VCSEL lasers. The transmitter input lines are driven with differential CML signals applied to the transmitter (TX+ and TX-) lines. Dual loop, temperature compensated, VCSEL drivers convert the transmitter input signals to suitable VCSEL bias and modulation currents. The TX\_Fault circuit disables the optical transmitter output when the optical output power or internal current exceeds predefined limits. The fault condition is latched until reset by a toggle of TX\_Dis or VCC. A CMOS fault signal is generated on the TX\_Fault line upon a transmitter optical or electrical fault condition.

The optical mating interface to the Magnum series size 8 cavity insert optical transmitters is an ARINC 801 1.25 mm ceramic fiber optic stub. The stub has an integral 50 / 125  $\mu$ m multimode optical fiber enabling it to interface to either 62.5 / 125  $\mu$ m or 50 / 125  $\mu$ m optical fiber cable.

The electrical interface to the Magnum series size 8 cavity insert optical transmitters is an eight position pin field suitable for thru-hole soldering to a flexible or rigid printed circuit.

Magnum series size 8 cavity insert optical transmitters are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

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Rear Release Optical Transmitter Unit  
ARINC 801 / 1.25 mm Ferrule / PCB Mounted

## FEATURES

- Compliant with Arinc 664, 818, 801, 803 and 804
- Suitable for Fast Ethernet, Gigabit Ethernet, 1x / 2x / 4x Fibre Channel and sFPDP applications from 50 Mbps to 4.25 Gbps
- Maximum optical channel bit error rate less than  $1 \times 10^{-12}$
- Operating temperature range from  $-40^{\circ}$  to  $+85^{\circ}$  C
- Designed to perform when subjected to shock and vibration per RTCA / DO-160E
- ARCAP contact insert material meets stringent EMI / RFI / ESD and EMP performance specifications
- Eight pin PCB footprint with TX\_Fault and TX-Dis functions
- 1.25 mm ceramic optical fiber receptacle connector interface per ARINC 801
- Compatible with MIL-DTL-38999 size 8 insert cavities

## APPLICATIONS

Magnum series printed circuit board mounted optical transmitters enable high speed network communications over long distances in harsh environments.

- Fast or Gigabit Ethernet switches and peripherals
- Fibre Channel switches and peripherals
- sFPDP data links
- Video displays

This size 8 optoelectronic cavity insert provides a rugged optical interface that is compliant with 1.25 mm ceramic optical ferrules. The multimode optical fiber interface supports applications where copper cable link distance, bandwidth, weight or bulk make the use of twisted pair, twinax or quadax copper conductors unacceptable.

### ORDERING INFORMATION

Application	Part Number
50 Mbps to 3.19 Gbps	P44R-TS1E-LK
50 Mbps to 3.19 Gbps - EMI Hardened	P44R-TS1E-LK-EMI
3.2 Gbps to 4.25 Gbps	P44R-TS1G-LK
3.2 Gbps to 4.25 Gbps EMI Hardened	P44R-TS1G-LK-EMI

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## ABSOLUTE MAXIMUM RATINGS

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Storage Temperature	$T_S$	-55		+100	°C
Supply Voltage	$V_{CC}$	-0.5		+4.5	V
TX_DIS Input Voltage	$V_I$	-0.5		$V_{CC} + 0.5$	V
Differential Input Voltage (p-p)	$V_D$			2.2	V

## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	$T_A$	-40		+85	°C
Power Supply Voltage	$V_{CC}$	+3.135		+3.465	V
TX Differential Input Voltage (p-p)	$V_D$	0.25		2.2	V
Power Supply Noise (p-p)	$N_p$			200	mV

## DESIGNED TO PERFORM UNDER THE FOLLOWING CONDITIONS

Requirement	Feature	Condition	Notes
RTCA / D0-160E	ESD	HBM	2200 V
RTCA / D0-160E	Vibration	3.8 g <sup>2</sup> / Hz	43 G rms
RTCA / D0-160E	Shock	40.0 g	6-9 ms
RTCA / D0-160E	Flame Resistance		30 seconds
RTCA / D0-160E	Damp Heat	10 Cycles	24 hours
ARINC 801	Mating Durability	500 Cycles	< 0.5 dB Change
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

## MATERIALS

Item	Detail	Notes
Insert Shell and Plating	ARCAP AP1D	
Solder Pins	Brass	
Solder Pin Plating	Gold over Nickel	
Ferrule	Ceramic	
Printed Circuits	Polyimide / FR-4	

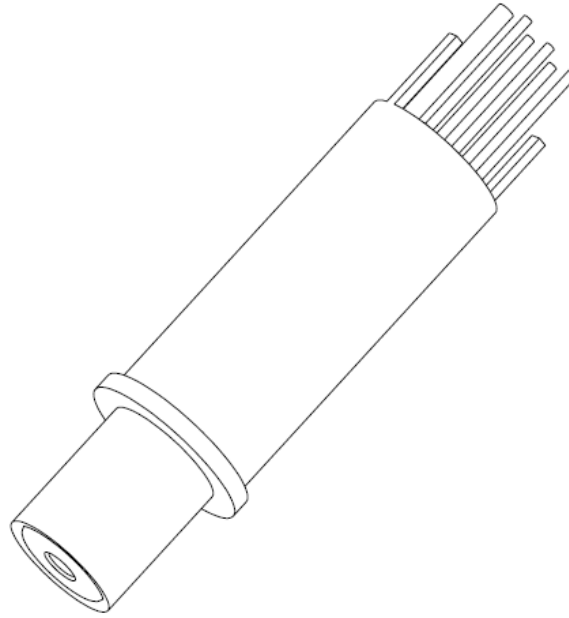
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## OPTICAL TRANSMITTERS $T_A$ = OPERATING TEMPERATURE RANGE, $V_{CC}$ = 3.135 V TO 3.465 V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power (BER < $10^{-12}$ )	$P_i$	-6.5		-1.0	dBm
Optical Wavelength	$\lambda_{OUT}$	830	850	860	nm
Spectral Width	$\Delta\lambda_{RMS}$			0.85	nm
Extinction Ratio xxxx-xx1E-xx @ 125 Mbps to 1.25 Gbps xxxx-xx1E-xx @ 2.125 Gbps xxxx-xx1E-xx @ 2.5 Gbps to 3.19 Gbps xxxx-xx1G-xx @ 3.2 Gbps to 4.25 Gbps	ER	6.0 6.0 6.0 6.0			dB

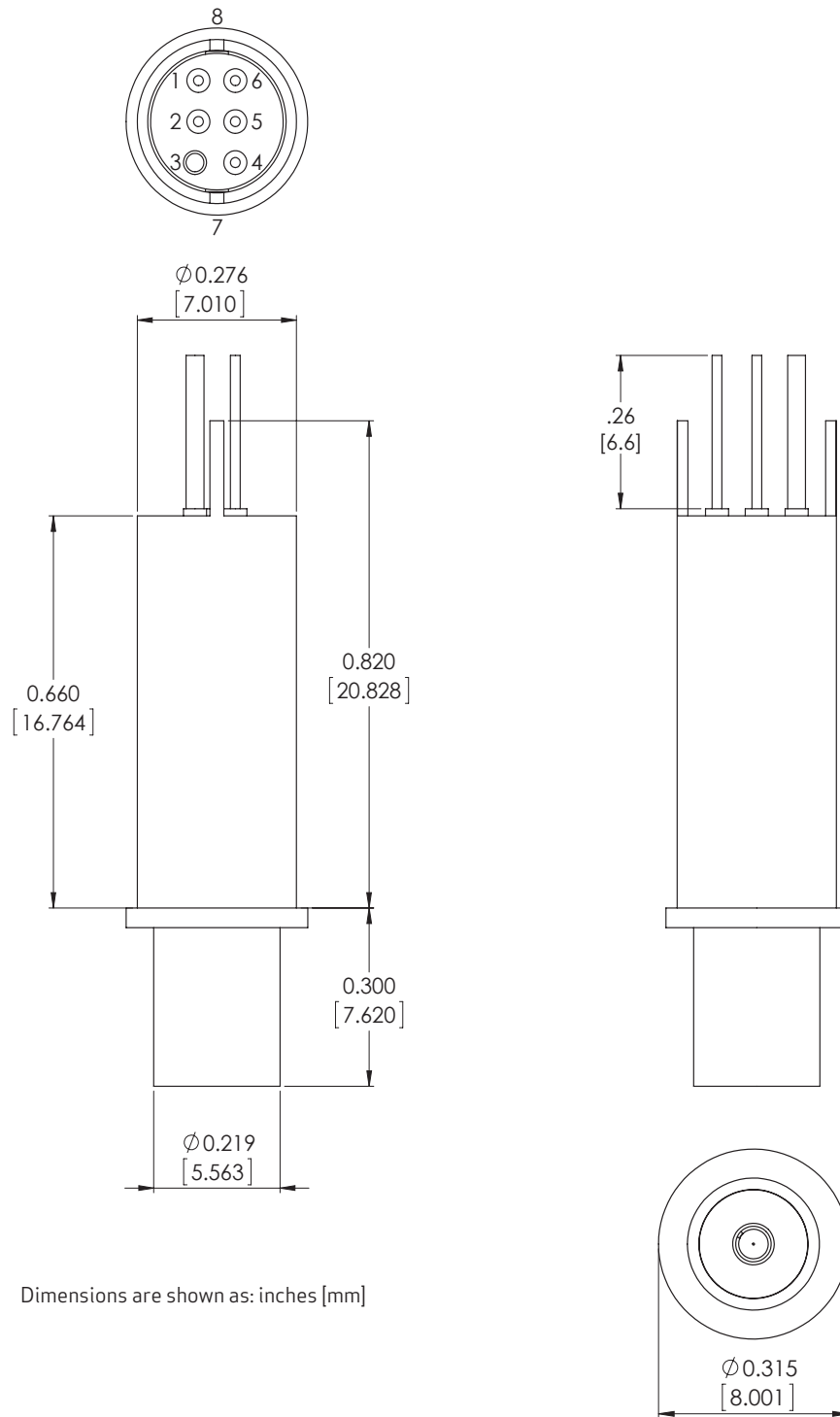
## POWER SUPPLY CURRENT $T_A$ = OPERATING TEMPERATURE RANGE, $V_{CC}$ = 3.135 V TO 3.465 V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current Per Transmitter	$I_{CCT}$		80	110	mA



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## OUTLINE DRAWING

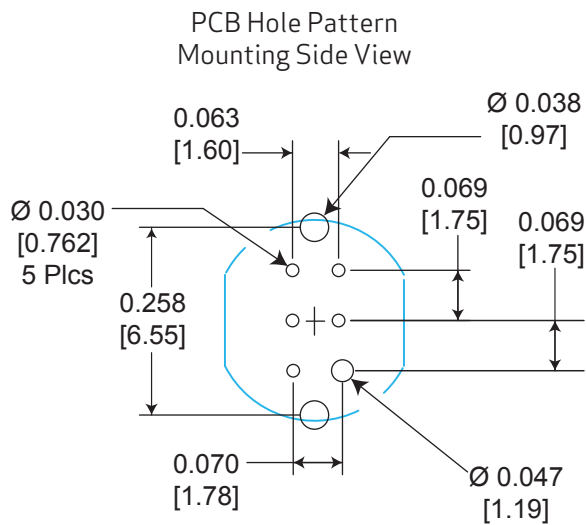


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## ELECTRICAL PIN ASSIGNMENTS - MAGNUM SIZE 8 CAVITY INSERT

Pin Number	Symbol	Description	Logic Family
1	TX_DIS	Transmit Disable - Input Logic 1: Disable Optical Output Logic 0: Enable Optical Output	CMOS Internal 4.7 KΩ to 10.0 KΩ pulldown
2	V <sub>CC</sub>	Power Supply	N/A
3	GND	Signal Ground	N/A
4	TX_Fault	Internal TX Fault Indicator - Output Satisfactory Operation: Logic "0" Output Internal Fault: Logic "1" Output	Open Drain CMOS
5	TX+	Transmitter Data - Output	CML
6	TX-	Transmitter Data - Output	CML
7	GND	Case Ground	N/A
8	GND	Case Ground	N/A

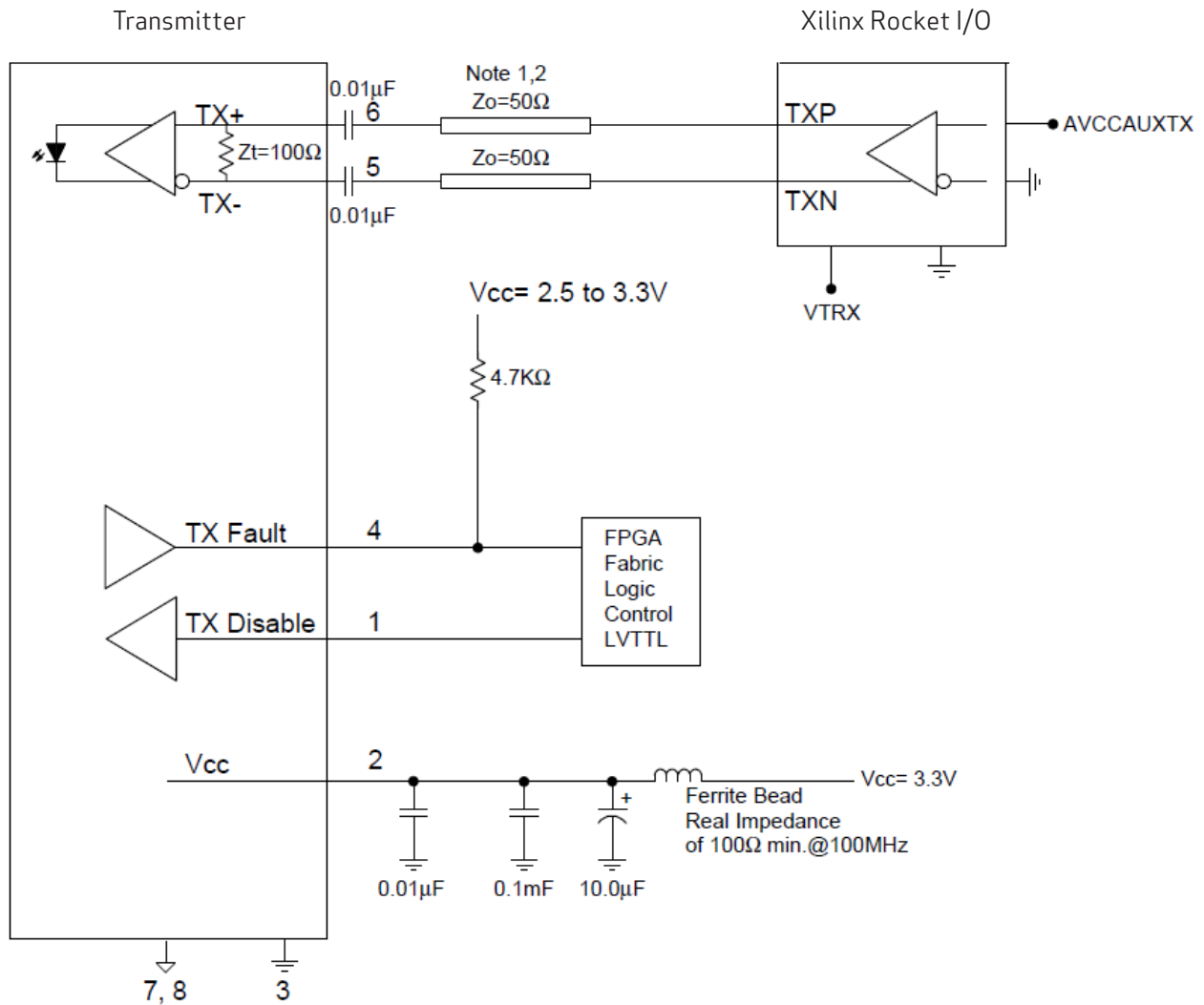
## PRINTED CIRCUIT BOARD FOOTPRINT



Dimensions are shown as: inches [mm]

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## APPLICATION SCHEMATIC FOR XILINX ROCKET I/O INTERFACES



Typical application schematic shown. For alternate applications or termination techniques, please consult the factory.

Notes:

1. When using controlled impedance cable (coaxial cable) and Pre\_Emphasis, lengths of 1.0 meter are obtainable.
2. 50 Ohm impedance termination shown. For alternate impedance requirements, please consult the factory.

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## APPENDIX A1 PART NUMBER OPTIONS

**P44 R - TS1x - LK - xxx**

Shell Configuration  
**P44** = Size 8 Cavity Insert

Release Configuration  
**R** = Rear Release

Function  
**T** = Transmitter

Wavelength  
**S** = 850 nM

Power Supply  
**1** = +3.3 VDC

Fiber Optic Interface  
**E** = 50 Mbps - 3.19 Gbps  
**G** = 3.2 Gbps - 4.25 Gbps

Ferrule Size Code  
**L** = 1.25 mm

Shell Plating  
**K** = ARCAP

EMI Hardened  
**EMI** = EMI Hardened

Size 8 cavity adapter for the mating connector: P44R-801-ADPT



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