

# Magnum EMI Hardened 801 Series

Size 8 Cavity Optoelectronic PCB Insert,  
1.25mm, 850nm - ARINC 801, 803 &  
804 Compliant - Front Release

Front Release Optical Receiver Insert

## FEATURES

- Compliant with Arinc 664, 801, 803, 804 & 818
- Suitable for Fast Ethernet, Gigabit Ethernet and 1x/2x/4xFibre Channel applications from 3.2Gbps to 5.0Gbps
- Maximum optical channel bit error rate less than  $1 \times 10^{-12}$
- Operating temperature range from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Shock and vibration resistant per RTCA / D0-160E
- Arcap contact insert material meets stringent EMI / RFI / ESD & EMP performance specifications
- Six pin PCB footprint with Loss of Signal (LOS) functions
- 1.25mm ceramic optical fiber receptacle connector interface per ARINC 801
- Compatible with Arinc 600 and MIL-STD-83527 size 8Q (Quadrax) insert cavities

## APPLICATIONS

Magnum - 801 series printed circuit board mounted optical receivers enable high speed network communications over long distances in harsh environments.

- Fast or Gigabit Ethernet switches and peripherals
- Fibre Channel switches and peripherals
- Serial Rapid I/O (sRIO) interfaces
- Video displays

This size 8Q Optoelectronic cavity insert provides a rugged optical interface that is compliant with ARINC 801 1.25mm 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 quadrax copper conductors unacceptable.

US Pat. # 7,690,849



ARINC 801 / 1.25mm Ferrule / PCB Mounted

## DESCRIPTION

Magnum - 801 series Optoelectronic size 8 cavity PCB insert receivers consist of optoelectronic receiver functions integrated into a printed circuit board mounted pin contact. The optical receivers are 850nm PIN diodes + integrated limiting amplifiers. Outputs from the receivers consist of differential CML data signals on the receiver (RX+ and RX-) lines. A CMOS output signal is generated on the Loss of Signal (LOS) line upon loss of a valid incoming optical data. The receiver data lines are squelched upon LOS assertion, preventing errant data generation when an invalid incoming optical signal is presented to the optical receiver.

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

The electrical interface to the Magnum - 801 series size 8 cavity insert optical receivers is a six position pin header suitable for thru-hole soldering to a flexible or rigid printed circuit.

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

## ORDERING INFORMATION

Application	Part Number
3.2Gbps to 5.0Gbps	P44F-RS1G-LK-EMI

Magnum Series, EMI, 1.25mm Ferrule, Size 8 Cavity Insert, Optical Receiver,  
Multimode, 850nm, Arinc 664, 818, 801, 803 & 804 Compliant

## 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
RX Output Current	$I_o$			50	mA

## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	$T_A$	-55		+85	°C
Power Supply Voltage	$V_{cc}$	+3.135		+3.465	V
Power Supply Noise (p-p)	$N_p$			200	mV

## SPECIFICATIONS COMPLIANCE

Requirement	Feature	Condition	Notes
RTCA / D0-160E	ESD	Class II	2200V
RTCA / D0-160E	Vibration	3.8g <sup>2</sup> /Hz	43G rms
RTCA / D0-160E	Shock	40.0g	6-9mS
RTCA / D0-160E	Flame Resistance	Method 1012	30 Seconds
RTCA / D0-160E	Damp Heat	10 Cycles	24 Hours
ARINC 801	Mating Durability	500 Cycles	<0.5dB Change
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

## MATERIALS

Item	Detail	Notes
Insert	Arcap	
Solder Pins	Brass	
Solder Pin Plating	Gold	
Ferrule	Ceramic	
Printed Circuits	Polyimide / FR-4	

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**OPTICAL RECEIVERS  $T_A$  = Operating Temperature Range,  $V_{CC}$  = 3.135V to 3.465V**

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity (BER<10 <sup>-12</sup> , ER=9.0) xxxx-xxxE-xx @ 50Mbps to 1.25Gbps xxxx-xxxE-xx @ 2.125Gbps xxxx-xxxE-xx @ 2.5Gbps to 3.19Gbps xxxx-xxxG-xx @ 3.2Gbps to 5.0Gbps	$P_I$	-17.0 -15.0 -15.0 -14.0		0.0	dBm
Optical Wavelength	$\lambda_{IN}$	830		860	nM
Optical Modulation Amplitude (ER=9.0, p-p) xxxx-xxxE-xx @ 50Mbps to 1.25Gbps xxxx-xxxE-xx @ 2.125Gbps xxxx-xxxE-xx @ 2.5Gbps to 3.19Gbps xxxx-xxxG-xx @ 3.2Gbps to 5.0Gbps	OMA	31 49 56 61			$\mu$ W
CML Differential Output Voltage (p-p)	$V_{Diff}$	600	780	1200	mV
Loss of Signal (LOS) Deassert Level	$P_{OFFr}$	-28.0			dBm
Loss of Signal (LOS) Hysteresis	HYS	1.5	2.25	3.5	dB

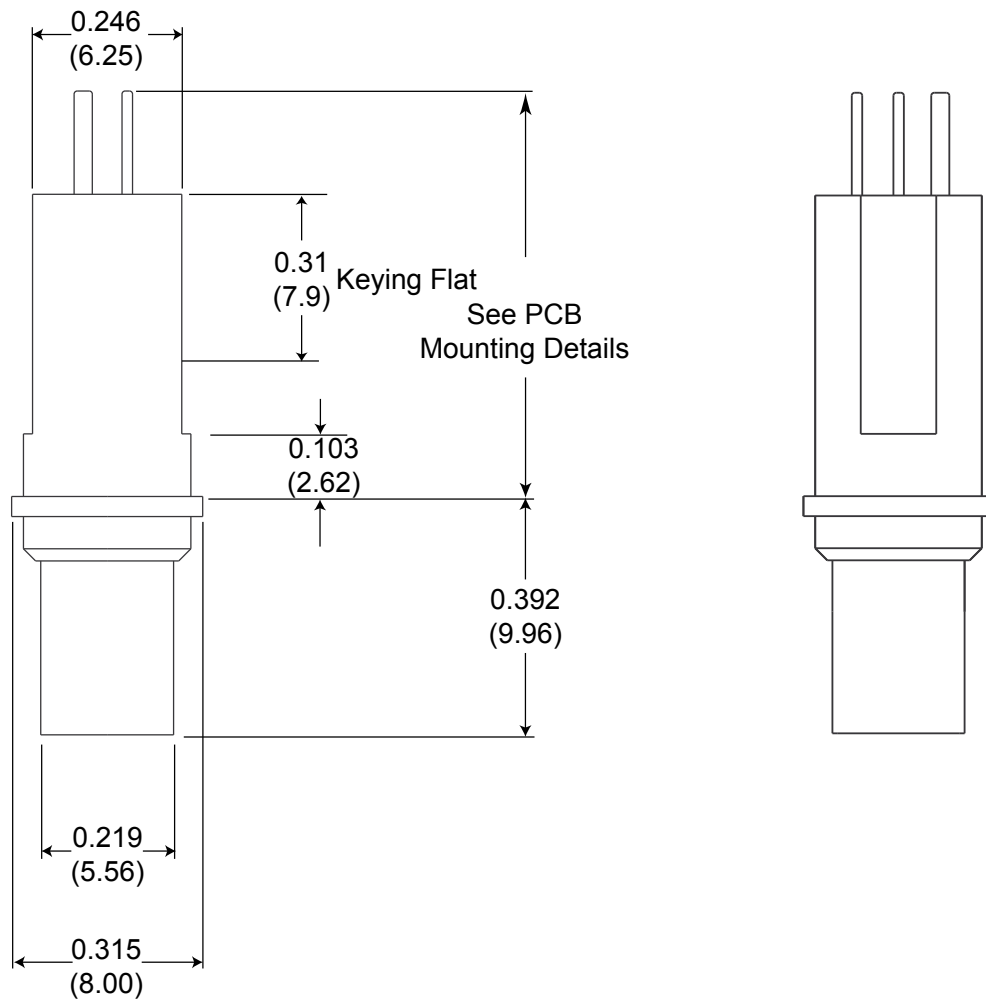
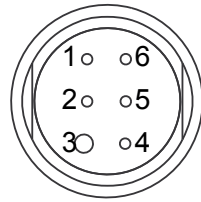
**POWER SUPPLY CURRENT  $T_A$  = Operating Temperature Range,  $V_{CC}$  = 3.135V to 3.465V**

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

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### OUTLINE DRAWING

Dimensions are shown as: inches (mm)



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## ELECTRICAL PIN ASSIGNMENTS

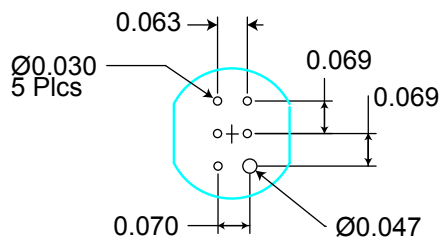
Magnum Size 8 Cavity Insert

Pin Number	Symbol	Description	Logic Family
1	GND	Ground	N/A
2	V <sub>cc</sub>	Power Supply - Input	N/A
3	GND	Ground	N/A
4	LOS	Loss of Signal - Output Satisfactory Optical Input: Logic "0" Output Unsatisfactory Optical Input: Logic "1" Output	Open Drain CMOS
5	RX-	Receiver Data - Output	CML
6	RX+	Receiver Data - Output	CML

## PRINTED CIRCUIT BOARD FOOTPRINT

Dimensions are shown as: inches

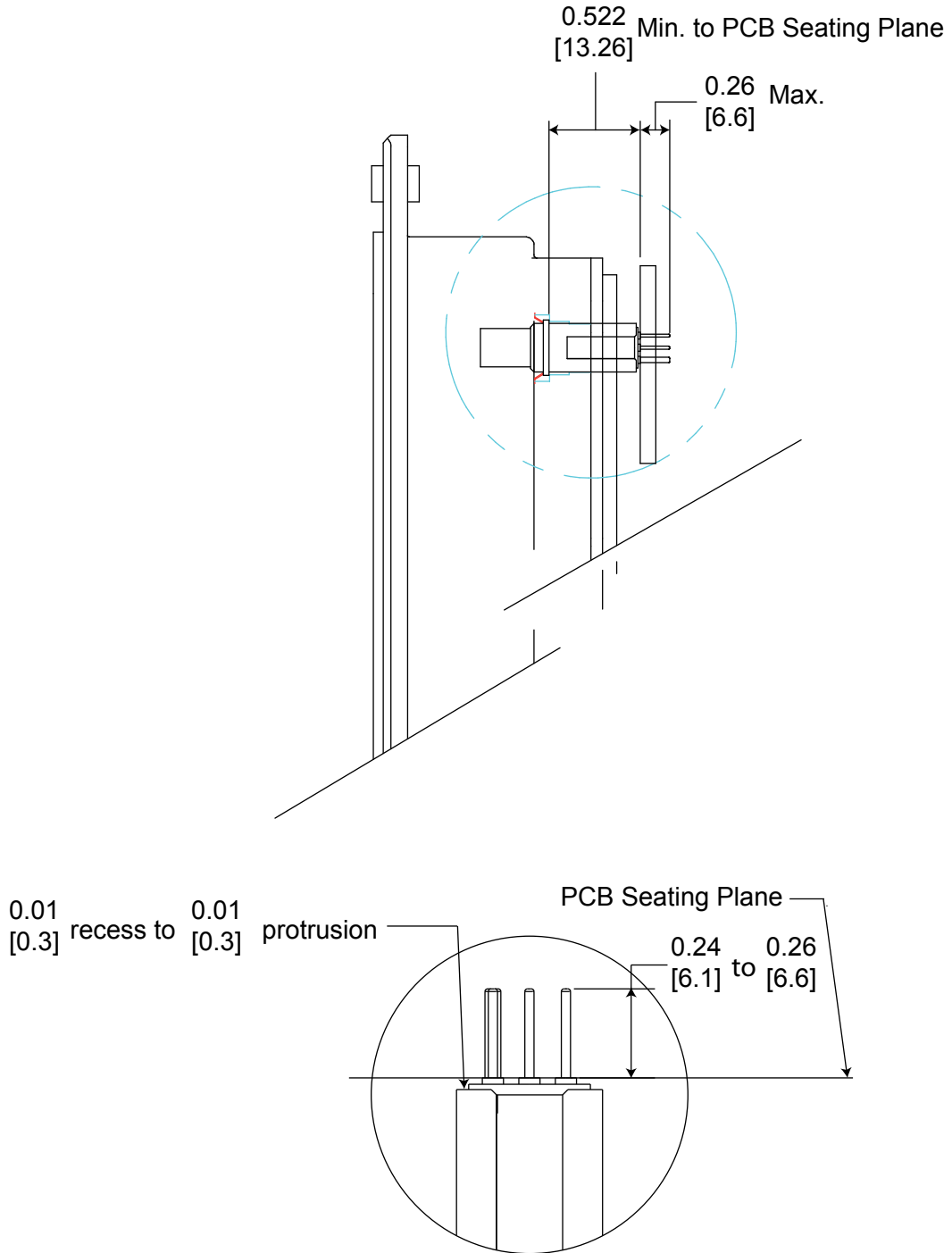
### PCB Hole Pattern Mounting Side View



Magnum Series, EMI, 1.25mm Ferrule, Size 8 Cavity Insert, Optical Receiver,  
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### PCB MOUNTING DETAILS

Dimensions are shown as: inches [mm]



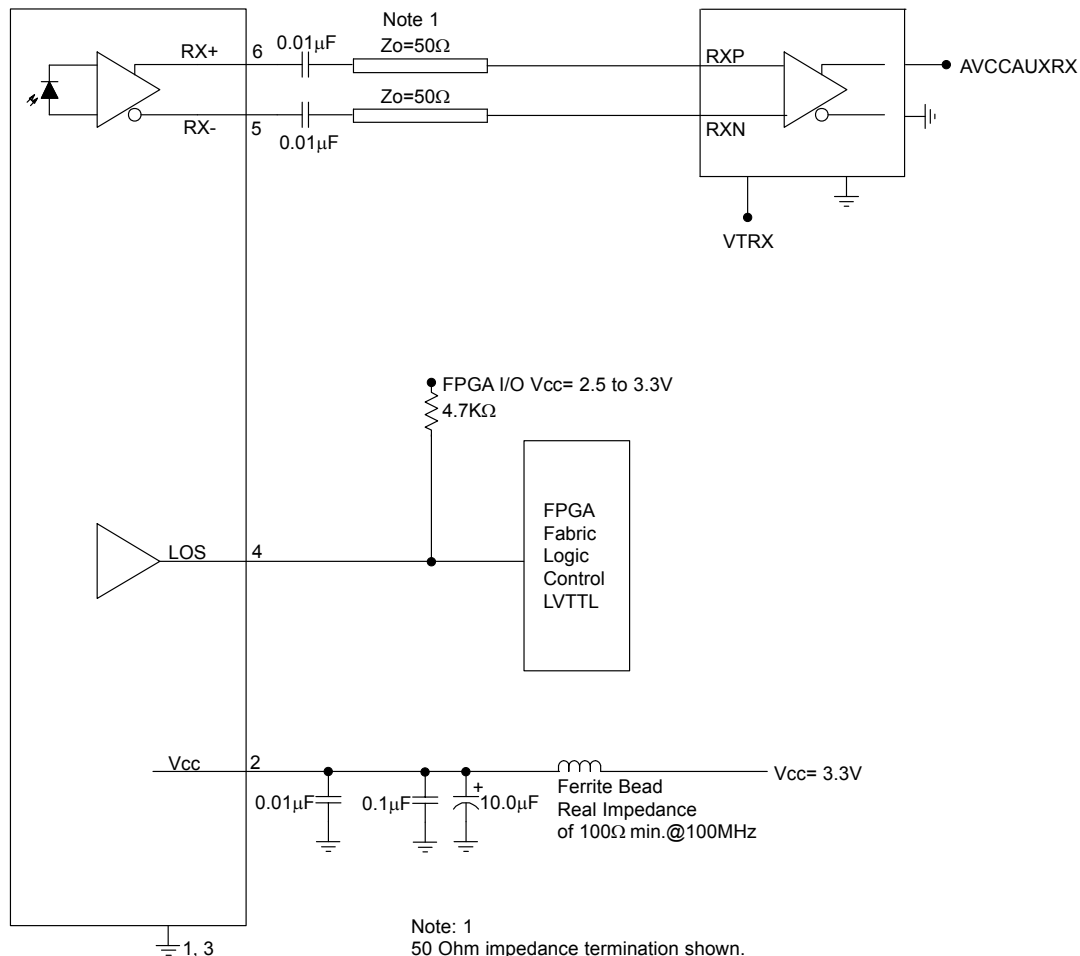
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## APPLICATION SCHEMATIC

For Xilinx Rocket I/O Interfaces

### Optical Receivers

### Xilinx Rocket I/O



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

Note: 1  
50 Ohm impedance termination shown.  
For alternate impedance requirements,  
please consult the Factory.

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