

## 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 receivers consist of optoelectronic receiver functions integrated into a printed circuit board mounted pin contact. The optical receiver is an 850 nm PIN diode + limiting amplifier. Outputs from the receiver 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 receiver 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 receiver 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 receivers are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

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

Rear Release Optical Receiver 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 Loss of Signal (LOS) 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 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
- 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 quadrax copper conductors unacceptable.

### ORDERING INFORMATION

Application	Part Number
50 Mbps to 3.19 Gbps	P44R-RS1E-LK
50 Mbps to 3.19 Gbps - EMI Hardened	P44R-RS1E-LK-EMI
3.2 Gbps to 4.25 Gbps	P44R-RS1G-LK
3.2 Gbps to 4.25 Gbps EMI Hardened	P44R-RS1G-LK-EMI

# MAGNUM SERIES SIZE 8 CAVITY OPTOELECTRONIC PCB INSERT, REAR RELEASE, 850 NM - ARINC 818, 801, 803 AND 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	$V_{cc}$	-0.3		+4.0	V
RX Output Current	$V_o$			50	mA

## 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
Power Supply Noise (p-p)	$N_p$			200	mV

## DESIGNED TO SPECIFICATIONS

Requirement	Description	Section
MIL-STD-461	Conducted Emissions	CE102
MIL-STD-461	Conducted Susceptibility	CS101, CS114-116
MIL-STD-461	Radiated Emissions	RE102
MIL-STD-461	Radiated Susceptibility	RS103
MIL-STD-810	High/Low Temp Opp	M 501.6 / 502.6 P II
MIL-STD-810	High/Low Temp Storage	M 502.6 / 502.6 P I
MIL-STD-810	Altitude Opp / Non-Opp	M 500 P I, 15k feet
MIL-STD-810	Humidity	M 507, P II
MIL-STD-810	Acoustic Noise	M 515.7 P I
MIL-STD-810	Shock	> 100G
MIL-STD-810	Vibration	M 514
MIL-STD-810	Sea Salt Atmosphere	M 509
MIL-STD-810	Fungus	M 508.6
ANSI/ESD S20.20	ESD	Class 1

## MATERIALS

Item	Detail	Notes
Insert Shell and Plating	Arcap AP1D	
Solder Pins	Brass	
Solder Pin Plating	Gold Over Nickel	
Ferrule	Ceramic	
Printed Circuits	FR-4	

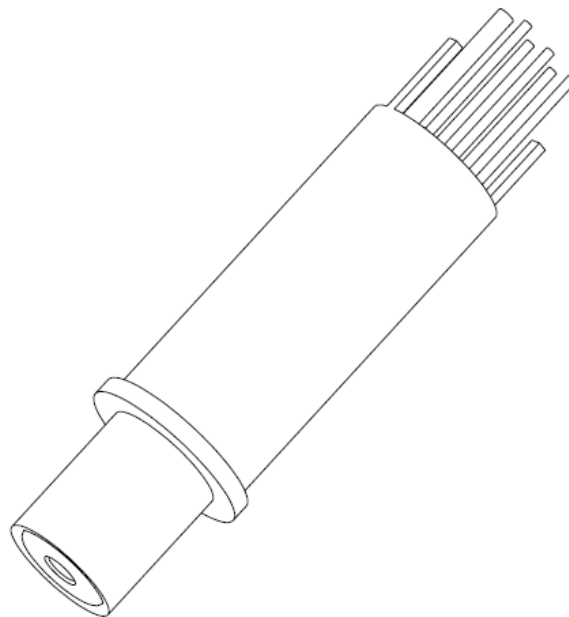
# MAGNUM SERIES SIZE 8 CAVITY OPTOELECTRONIC PCB INSERT, REAR RELEASE, 850 NM - ARINC 818, 801, 803 AND 804 COMPLIANT

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

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity (BER < $10^{-12}$ )					
xxxx-xxxE-xx @ 50 Mbps to 1.25 Gbps	P <sub>I</sub>	-17.0		0.0	dB
xxxx-xxxE-xx @ 2.125 Gbps		-15.0			
xxxx-xxxE-xx @ 2.5 Gbps to 3.19 Gbps		-15.0			
xxxx-xxxG-xx @ 3.2 Gbps to 4.25 Gbps		-14.0			
Optical Wavelength	$\lambda_{IN}$	770		860	nm
Optical Modulation Amplitude (ER = 9.0, p-p)					
xxxx-xxxE-xx @ 50 Mbps to 1.25 Gbps	OMA	31			$\mu$ W
xxxx-xxxE-xx @ 2.125 Gbps		49			
xxxx-xxxE-xx @ 2.5 Gbps to 3.19 Gbps		56			
xxxx-xxxG-xx @ 3.2 Gbps to 4.25 Gbps		61			
CML Differential Output Voltage (p-p)	V <sub>Diff</sub>	520	760	1200	mV
Loss of Signal (LOS) Deassert Level	P <sub>OFFr</sub>	-28.0			dBm
Loss of Signal (LOS) Hysteresis	HYS		2.5	4.5	dB

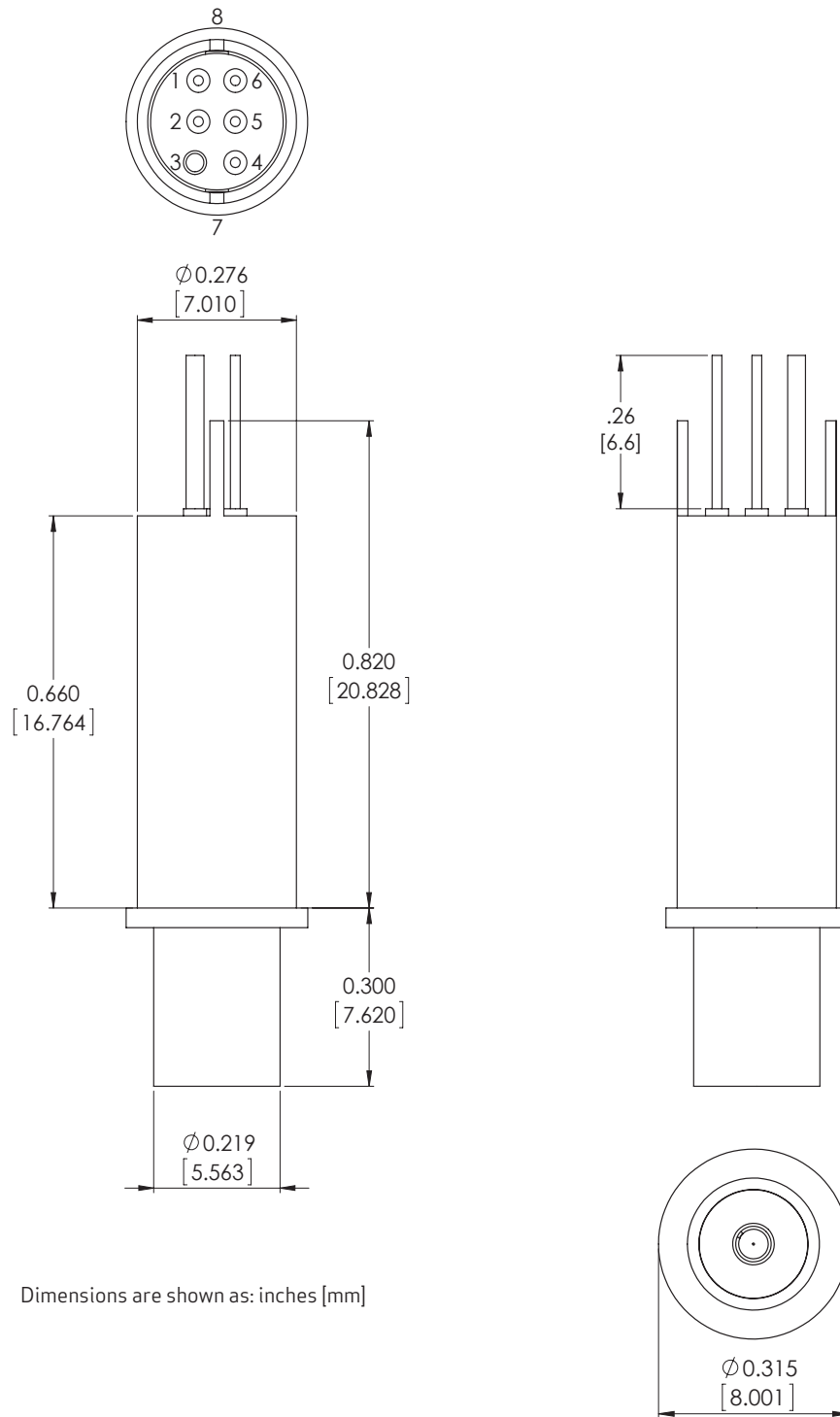
## POWER SUPPLY CURRENT $T_A$ = OPERATING TEMPERATURE RANGE, $V_{CC}$ = 3.135 V TO 3.465 V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current Per Receiver	I <sub>CCT</sub>		80	110	mA



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

## OUTLINE DRAWING



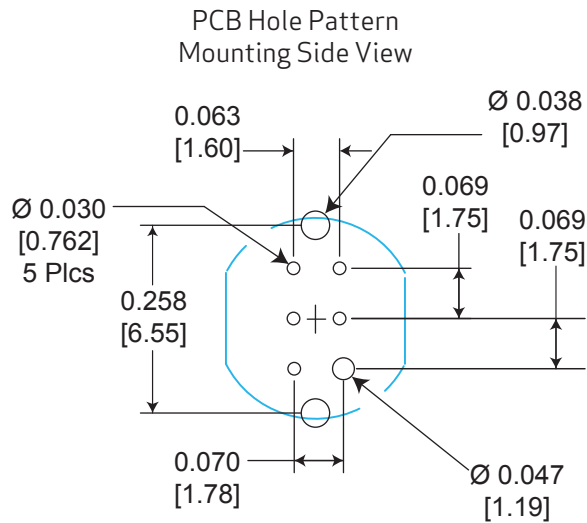
# MAGNUM SERIES SIZE 8 CAVITY OPTOELECTRONIC PCB INSERT, REAR RELEASE, 850 NM - ARINC 818, 801, 803 AND 804 COMPLIANT

## 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	Single 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-	Inverted Receiver Data - Output	CML
6	RX+	Non-Inverted Receiver Data - Output	CML
7	GND	Case Ground	N/A
8	GND	Case Ground	N/A

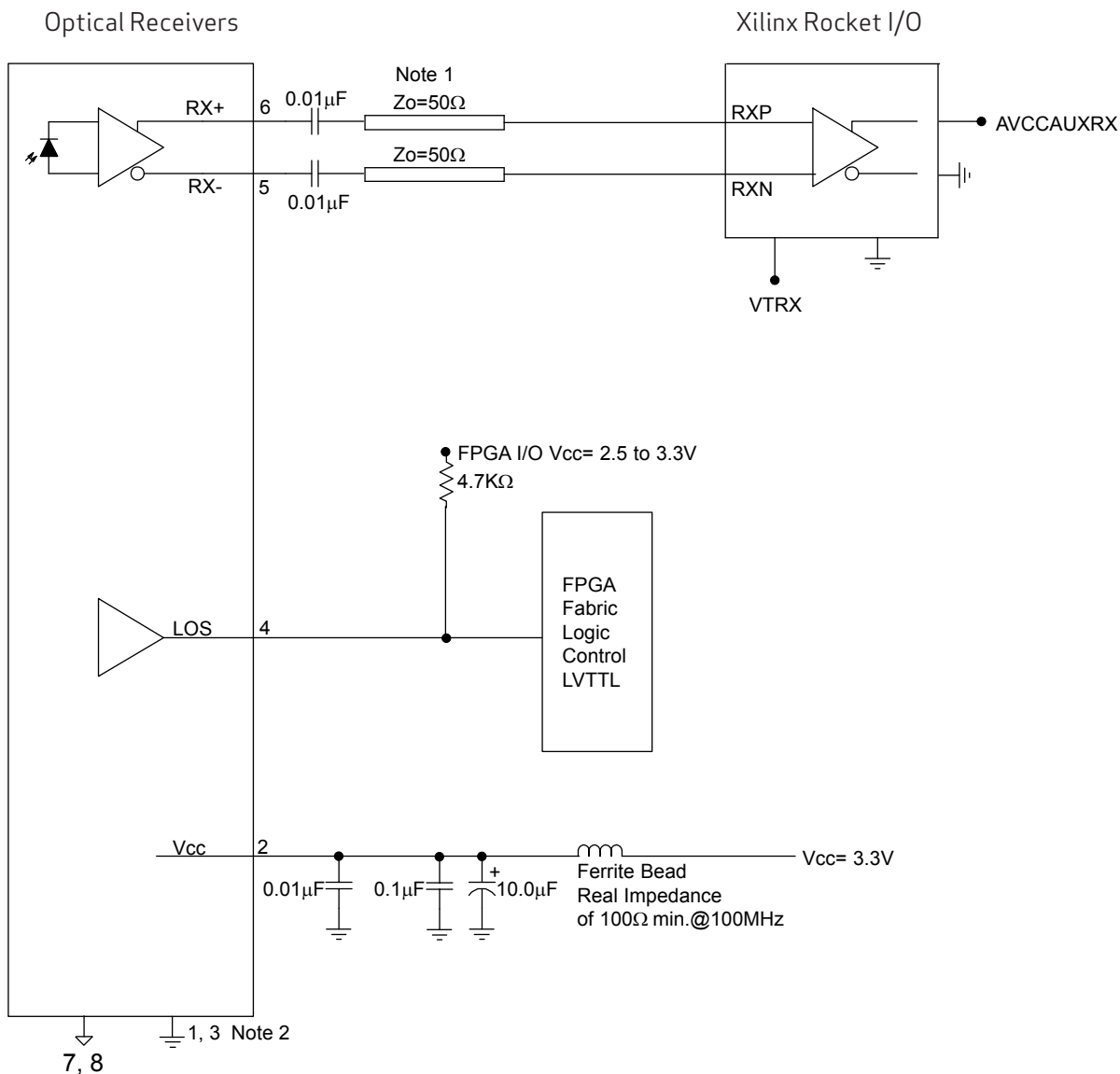
Note: For -EMI variant, Pins 1,3,7,8 are connected.

## PRINTED CIRCUIT BOARD FOOTPRINT



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

## APPLICATION SCHEMATIC FOR XILINX ROCKET I/O INTERFACES



Notes:

1. 50 Ohm impedance termination shown. For alternate impedance requirements, please consult the factory.
2. For -EMI variant, Pins 1,3,7,8 are connected.

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

## APPENDIX A1 PART NUMBER OPTIONS

**P44 R - RS1x - LK - xxx**

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

Release Configuration  
**R** = Rear Release

Function  
**R** = Receiver

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

\*Omit if standard version is requested



192 Bob Fitz Road, Johnson City, TN 37615  
salesmp@moog.com  
moogprotokraft.com