

Magnum Series

Size 8 Cavity Optoelectronic PCB Insert, ELIO[®], Rear Release, 850nmM -Arinc 818, 803 & 804 Compliant



Optical Receiver Unit

FEATURES

- Compliant with Arinc 664, 818, 803 & 804
- Suitable for Fast Ethernet, Gigabit Ethernet, 1x/2x/4xFibre Channel and sFPDP applications from 50Mbps to 5.0Gbps
- Maximum optical channel bit error rate less than 1×10^{-12}
- Operating temperature range from -40°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
- Eight pin PCB footprint with Loss of Signal (LOS) functions
- ELIO[®] 2.5mm ceramic optical fiber ferrule connector interface per EN 4531*
- 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
- sFPDP data links
- Video displays

This size 8 Optoelectronic cavity insert provides a rugged optical interface that is compliant with ELIO[®] 2.5mm 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 quadrx copper conductors unacceptable.

*ELIO[®] is a registered trademark of Esterline Souriau

One RX Channel Operating from 50 Mbps to 5.0 Gbps

DESCRIPTION

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 receivers are 850nm PIN diodes + 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 an ELIO[®] 2.5mm ceramic fiber optic ferrule stub per EN 4531. The ferrule stub has an integral $62.5/125\mu$ multimode optical fiber enabling it to interface to either $62.5/125\mu$ or $50/125\mu$ optical fiber cable.

The electrical interface to the Magnum series size 8 cavity insert optical receivers 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.

ORDERING INFORMATION

Application	Part Number
50Mbps to 3.19Gbps	P44R-RS1E-EK
3.2Gbps to 5.0Gbps	P44R-RS1G-EK

Magnum Series, 2.5mm Ferrule, Size 8 Cavity Insert, Optical Receiver,
Multimode, 850nm, Arinc 664, 818, 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	-40		+85	°C
Power Supply Voltage	V_{cc}	+3.135		+3.465	V
Power Supply Noise (p-p)	N_p			200	mV

ENVIRONMENTAL OPERATING CONDITIONS

Requirement	Feature	Condition	Notes
RTCA / D0-160E	ESD	HBM	2200V
RTCA / D0-160E	Vibration	3.8g ² /Hz	43G rms
RTCA / D0-160E	Shock	40.0g	6-9mS
RTCA / D0-160E	Flame Resistance		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 Shell & Plating	ARCAP AP1D	
Solder Pins	Brass	
Solder Pin Plating	Gold over Nickel	
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

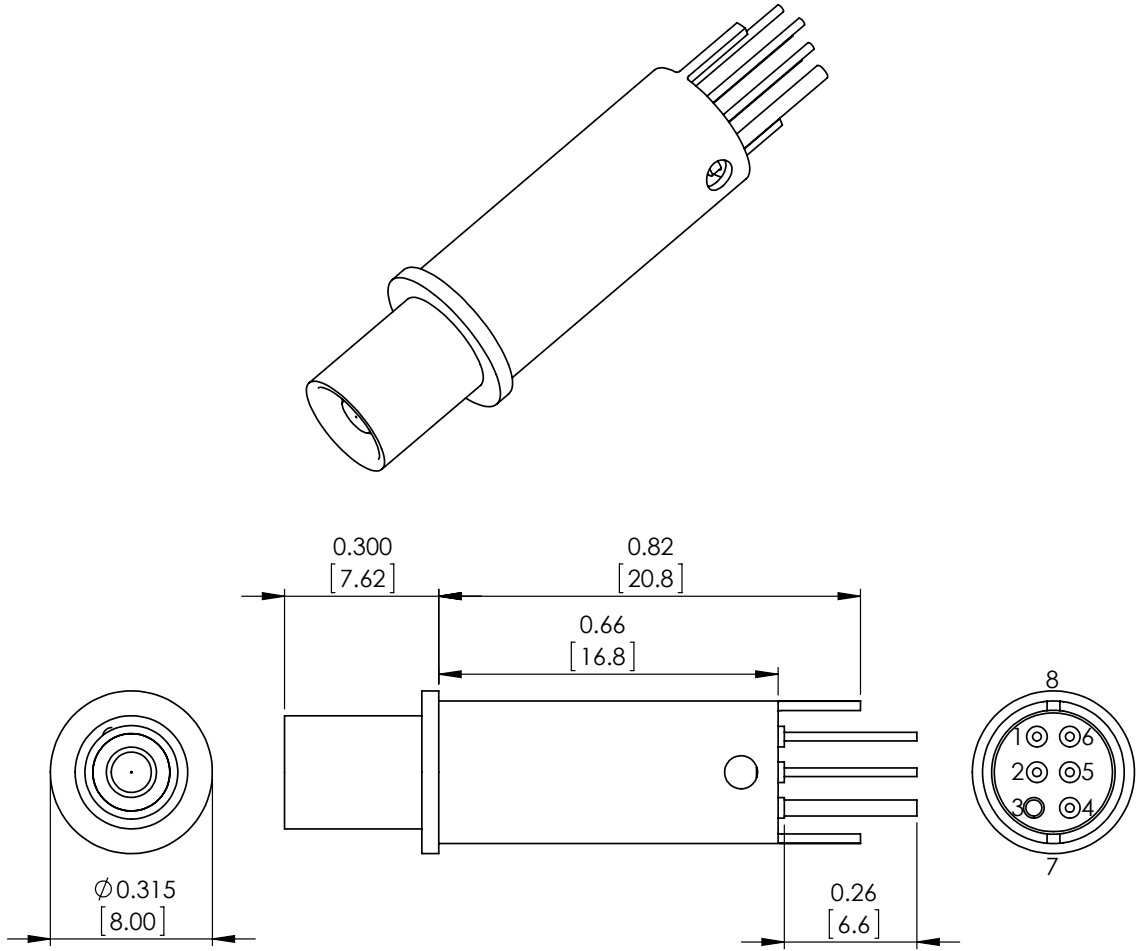
Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity (BER<10 ⁻¹² , ER=9.0) xxx-xxxE-xx @ 50Mbps to 1.25Gbps xxx-xxxE-xx @ 2.125Gbps xxx-xxxE-xx @ 2.5Gbps to 3.19Gbps xxx-xxxG-xx @ 3.2Gbps to 5.0Gbps	P_I	-17.0 -15.0 -15.0 -14.0		0.0	dBm
Optical Wavelength	λ_{IN}	830		860	nM
Optical Modulation Amplitude (ER=9.0, p-p) xxx-xxxE-xx @ 50Mbps to 1.25Gbps xxx-xxxE-xx @ 2.125Gbps xxx-xxxE-xx @ 2.5Gbps to 3.19Gbps xxx-xxxG-xx @ 3.2Gbps to 5.0Gbps	OMA	31 49 56 61			μ 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

OUTLINE DRAWING

Dimensions are shown as: inches (mm)



Rear release Size 8 optoelectronic pin insert shown, see Appendix A1 for details of the mating fiber optic cable receptacle

ELECTRICAL PIN ASSIGNMENTS

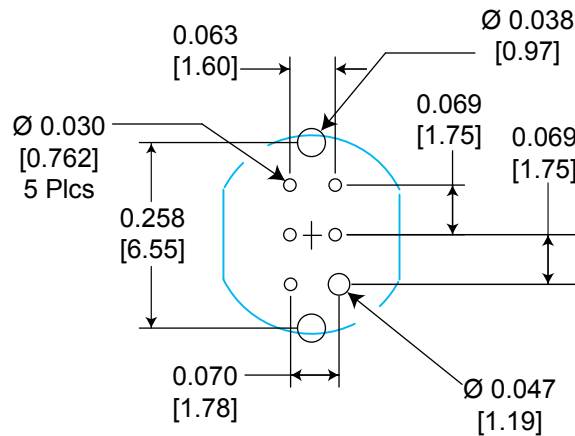
Magnum Size 8 Cavity Insert

Pin Number	Symbol	Description	Logic Family
1	GND	Ground	N/A
2	V _{cc}	Power Supply - Input	N/A
3	GND	Signal 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
7	GND	Case Ground	N/A
8	GND	Case Ground	N/A

PRINTED CIRCUIT BOARD FOOTPRINT

Dimensions are shown as: inches [mm]

PCB Hole Pattern
Mounting Side View



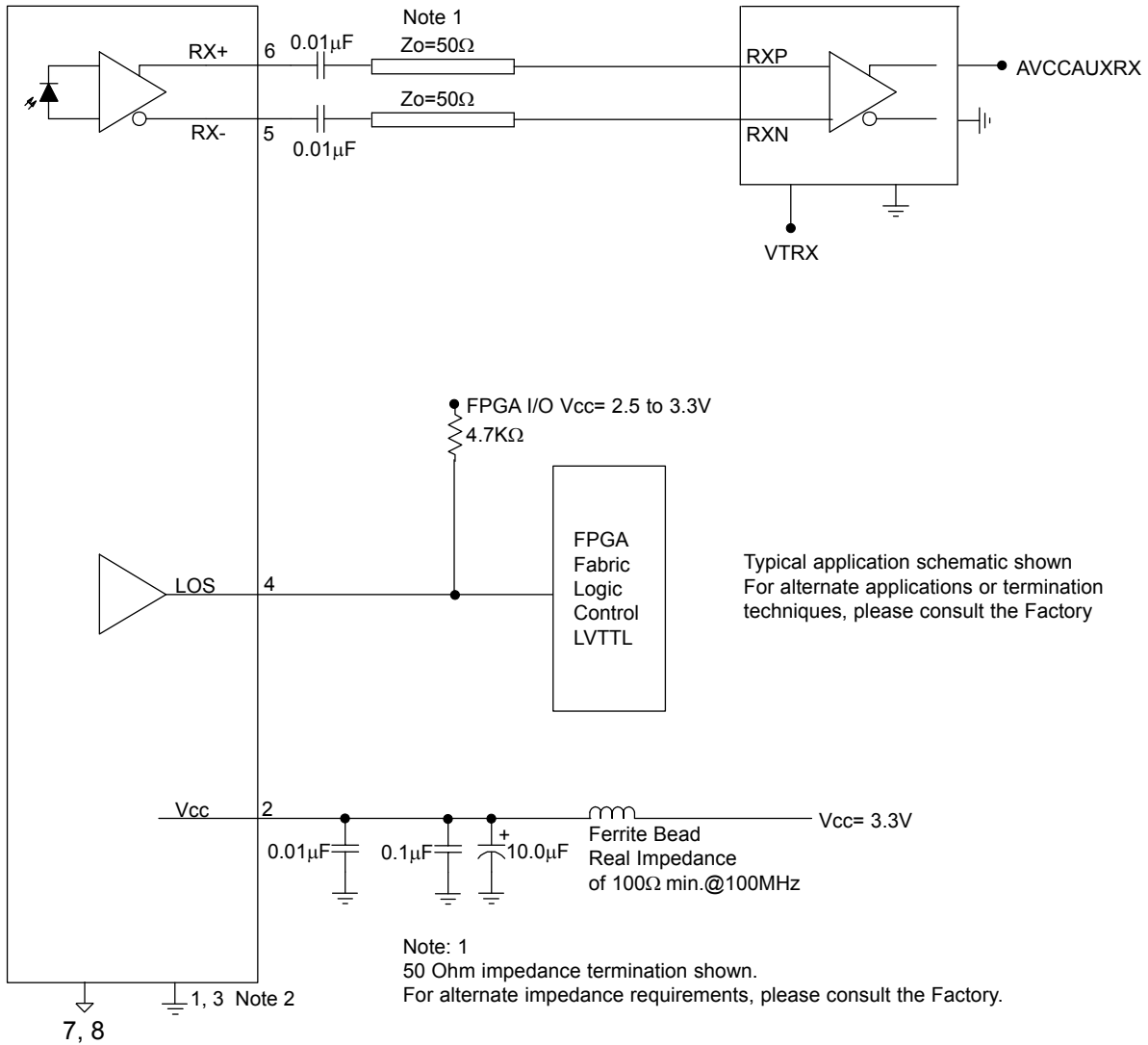
Magnum Series, 2.5mm Ferrule, Size 8 Cavity Insert, Optical Receiver,
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APPLICATION SCHEMATIC

For Xilinx Rocket I/O Interfaces

Optical Receivers

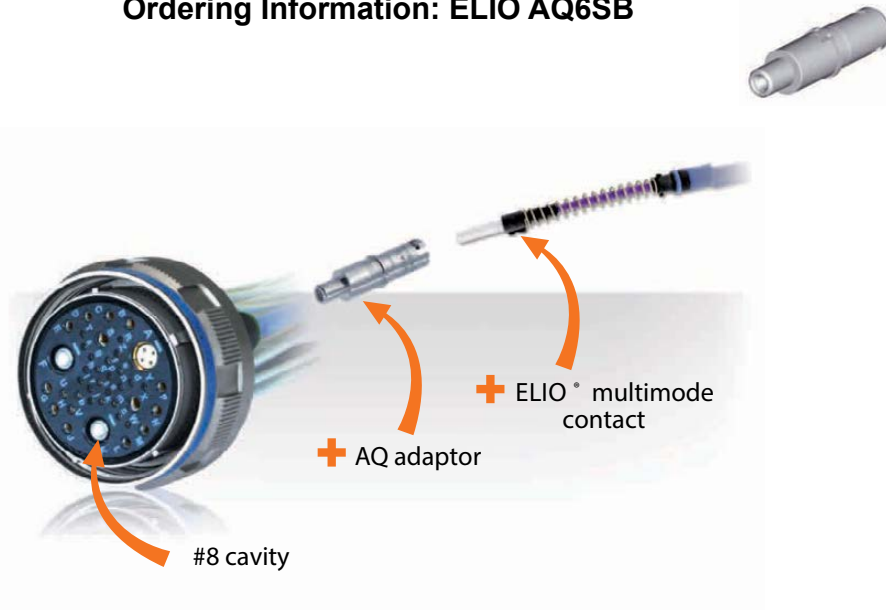
Xilinx Rocket I/O



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APPENDIX A1 SOURIAU ELIO® FIBER OPTIC CABLE ADAPTERS

ELIO® 8 Adapter for Size # 8 Cavity in MIL-DTL-38999 / EN3645 Receptacle Inserts
Ordering Information: ELIO AQ6SB



D38999 / EN3645 Ordering information
See Souriau 8D Series - MIL-DTL-38999 Series III catalog

ELIO® multimode contact Ordering information

ELIO	09N	G	L	A
Cable external diameter & Contact sealing:				
09N: 0.9 ^{+0.1} mm. Non waterproof				
18N: from 1.5mm to 1.9mm. Non waterproof				
18W: 1.8 ^{+0.1} mm. Waterproof				
20N: from 1.7mm to 2.1mm. Non waterproof				
20W: 2.0 ^{+0.1} mm. Waterproof				
Fibre type:				
G: ELIO® Multimode				
Boot type:				
L: Long boot				
S: Short boot				
N: No boot (non waterproof version only)				
Contact version index				



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