

Sabre Series

D38999 Size 09-01 Optical Receiver,
PCB Mount, *ELIO®, 850nm,
ARINC 818, 803 & 804

Optical Receiver, Flange Mount

FEATURES

- Compliant with ARINC 664, 818, 803 & 804
- Suitable for Fast Ethernet, Gigabit Ethernet, 1x/2x/4xFibre Channel and sFPDP applications from 100Mbps to 4.25Gbps
- Maximum optical channel bit error rate less than 1×10^{-12}
- Operating temperature range from -55°C to $+85^{\circ}\text{C}$
- Shock and vibration resistant per RTCA / D0-160E
- Olive drab cadmium over electroless nickel plating meets stringent corrosion performance specifications
- Six pin PCB footprint with Loss of Signal (LOS) function
- ELIO® 2.5mm ceramic optical fiber ferrule connector interface per EN 4531
- Compatible with D38999 ELIO® size 09-01 connectors

APPLICATIONS

Sabre series D38999 size 09-01 optical receivers enable high speed network communications over long distances in harsh environments.

- Fibre Channel switches and peripherals
- sFPDP data links
- ARINC 818 video interfaces

Sabre series D38999 size 09-01 optical receivers provide 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 quadax copper conductors unacceptable.

*ELIO® is a registered trademark of Souriau



One RX Channel Operating from 100Mbps to 4.25Gbps

DESCRIPTION

Sabre series D38999 size 09-01 optical receivers consist of optoelectronic receiver functions integrated into a wall mount D38999 optical connector. 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 of the Sabre series D38999 size 09-01 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 Sabre series D38999 size 09-01 optical receivers is a six position pin header suitable for thru-hole soldering to a flexible or rigid printed circuit.

Sabre series 38999 size 09-01 optical receivers are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

ORDERING INFORMATION

Application	Part Number
0.1 to 2.49Gbps	P86F-RS1D-AW
2.5Gbps to 3.19 Gbps	P86F-RS1E-AW
3.2Gbps to 4.25Gbps	P86F-RS1G-AW

See Appendix A2 for more part number options

Single Fiber Sabre Series Mil-Dtl-38999 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	-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 ² /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
38999 Shell	Aluminum	
38999 Shell Plating	Olive Drab Cadmium over Nickel	QQ-P-416, QQ-N-290
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 ⁻¹² , ER=9.0) xxxx-RS1D-xx @ 125Mbps to 1.25Gbps xxxx-RS1D-xx @ 2.125Gbps xxxx-RS1E-xx @ 2.5Gbps to 3.19Gbps xxxx-RS1G-xx @ 3.2Gbps to 4.25Gbps	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) xxxx-RS1D-xx @ 125Mbps to 1.25Gbps xxxx-RS1D-xx @ 2.125Gbps xxxx-RS1E-xx @ 2.5Gbps to 3.19Gbps xxxx-RS1G-xx @ 3.2Gbps to 4.25Gbps	OMA	31 49 56 61			μ W
CML Differential Output Voltage (p-p)	V_{Diff}	600	780	1200	mV
Signal Detect Deassert Level	P_{OFFr}	-28.0			dBm
Signal Detect Hysteresis	HYS	1.5	2.25	3.5	dB

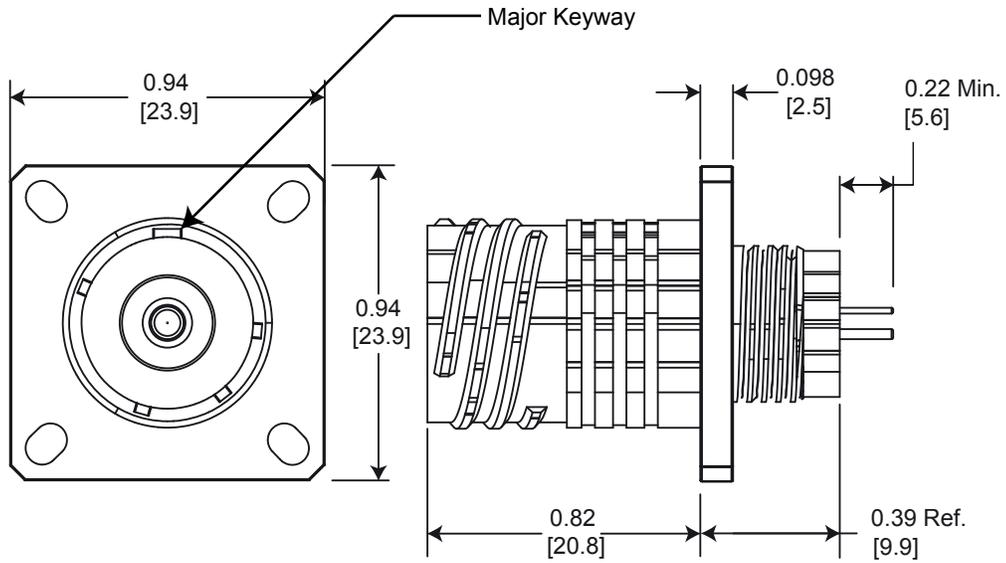
POWER SUPPLY CURRENT T_A = Operating Temperature Range, V_{CC} = 3.135V to 3.465V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current	I_{CCT}		50	75	mA

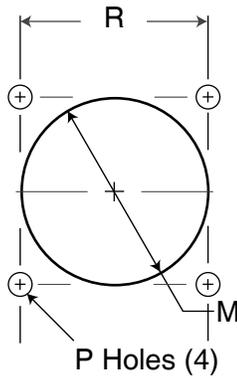
Single Fiber Sabre Series Mil-Dtl-38999 Optical Receiver,
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OUTLINE DRAWING

Dimensions are shown as: inches [mm]



For complete dimensions refer to:
MIL-DTL-38999 shell size A

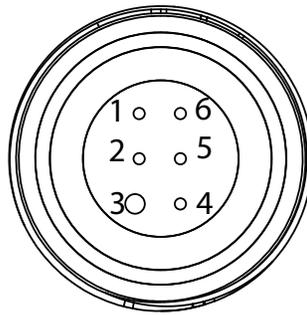


Panel Cutout Dimensions
Rear Panel Mounting Only

Shell Size Code	Shell Size	M Hole	P Holes	R Bsc
A	09	0.685 (16.99)	0.133 (3.4) 0.123 (3.1)	0.719 (18.26)

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OPTICAL RECEIVER ELECTRICAL INTERFACE TOP



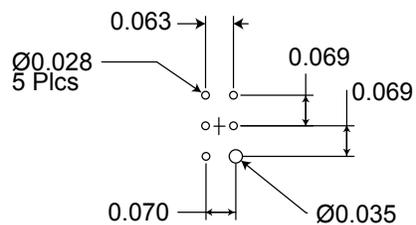
ELECTRICAL PIN ASSIGNMENTS

Pin Number	Symbol	Description	Logic Family
1	GND	Ground	N/A
2	V _{cc}	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 - Input	CML
6	RX+	Receiver Data - Input	CML

PRINTED CIRCUIT BOARD FOOTPRINT

Dimensions are shown as: inches

PCB Hole Pattern Mounting Side View



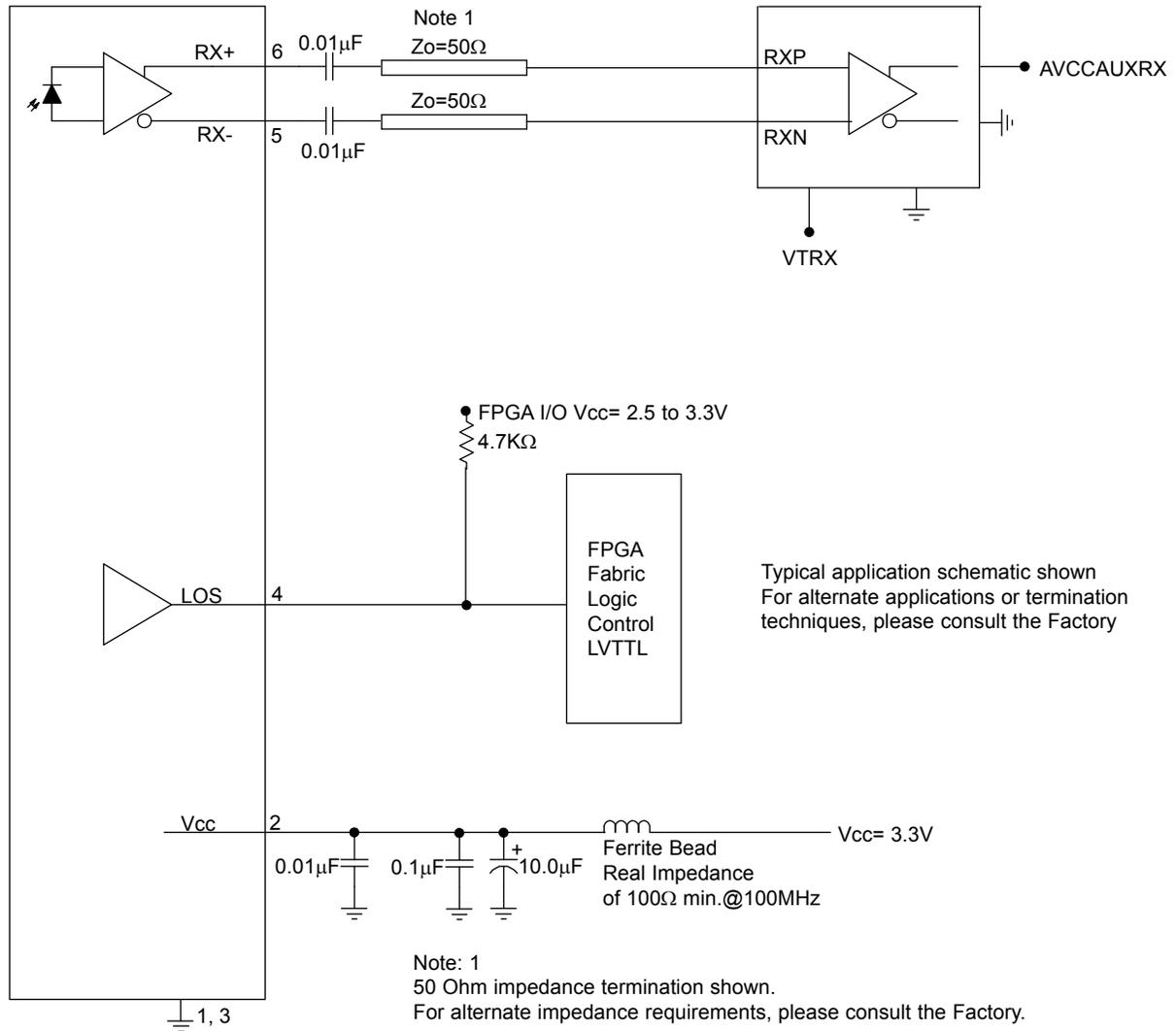
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APPLICATION SCHEMATIC

For Xilinx Rocket I/O Interfaces

Optical Receivers

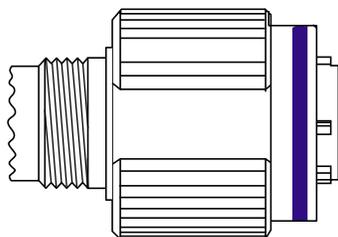
Xilinx Rocket I/O



APPENDIX A1

Mating Fiber Optic Connectors and Termini

ELIO® Plug Connector



8D	5	E	09	W	01	A	N
Shell type: 5 = Plug							
Designation: E							
Shell size: 09							
Plating							
W: Olive drab cadmium							
F: Nickel							
Insert arrangement: 01							
Insert: Male							
Polarization N, A, B, C, D, E							

ELIO® Termini

ELIO® multimode contact Ordering information

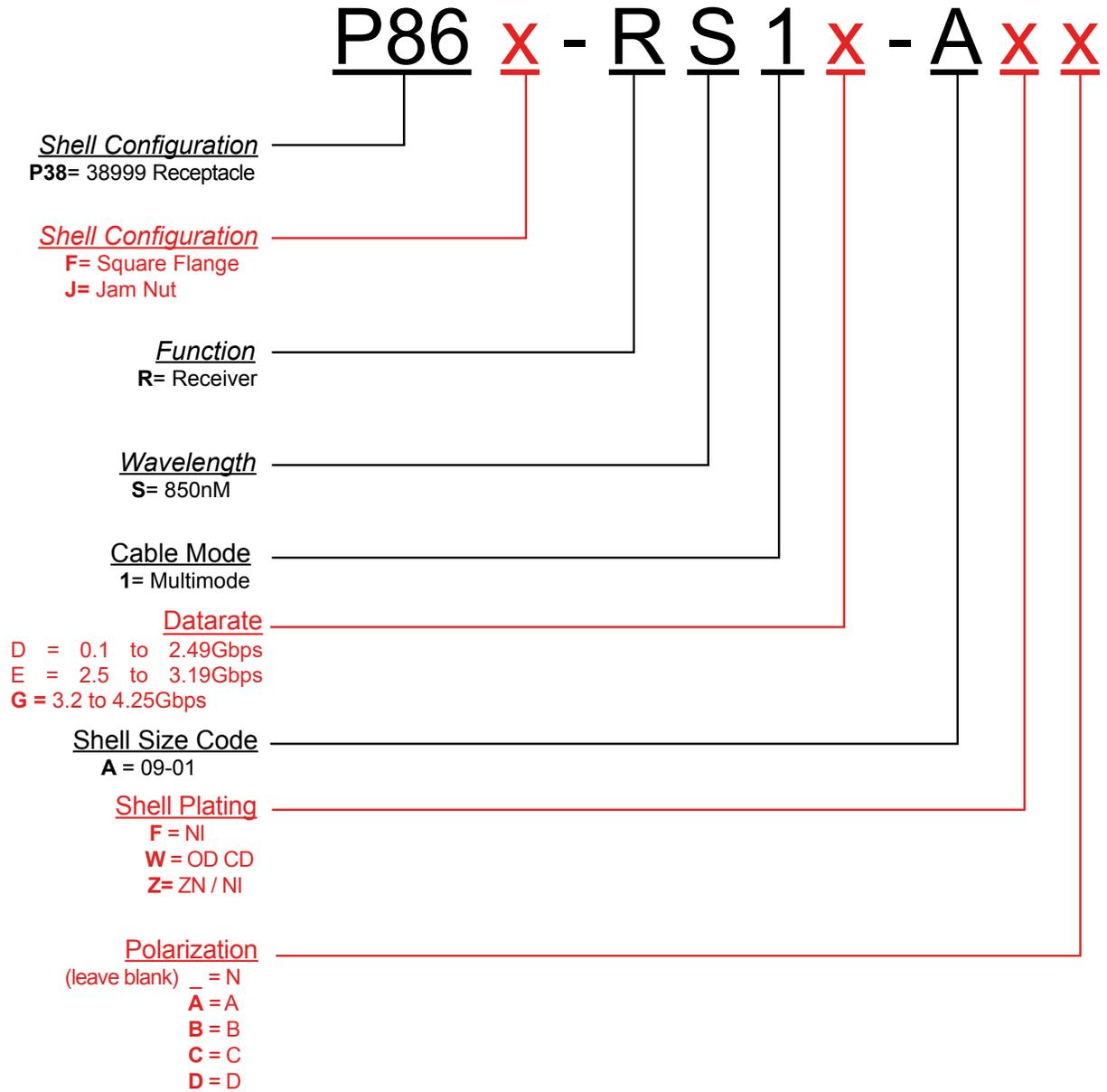
ELIO	09N	G	L	A
Cable external diameter & Contact sealing:				
09N: 0.9 ^{±0.1} mm. Non waterproof				
18N: from 1.5mm to 1.9mm. Non waterproof				
18W: 1.8 ^{±0.1} mm. Waterproof				
20N: from 1.7mm to 2.1mm. Non waterproof				
20W: 2.0 ^{±0.1} mm. Waterproof				
Fibre type:				
G: ELIO® Multimode fibre, 125 micrometers cladding				
Boot type:				
L: Long boot				
S: Short boot				
N: No boot (non waterproof version only)				
Contact version index				



Note: For ABS1379/EN4531 cross reference, please consult us.

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APPENDIX A2 PART NUMBER OPTIONS Sabre Series, Receivers



Other wavelength, mounting and port count options are available.
Please consult the Protokraft website for alternate configurations.



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