

## Sabre Series

38999 Size 09 Optoelectronic PCB Mount, \*ELIO®, 850nm, ARINC 818, 803 & 804, 3.3VDC

Optical Receiver, Jam Nut Double Flange

### FEATURES

- Compliant with ARINC 664, 818, 803 & 804
- Suitable for Fast Ethernet, Gigabit Ethernet, 1x/2x/4xFibre Channel and sFPDP applications from 125Mbps to 4.25Gbps
- Maximum optical channel bit error rate less than  $1 \times 10^{-12}$
- Operating temperature range from -55°C to +85°C
- Shock and vibration resistant per RTCA / D0-160E
- 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 quadrx copper conductors unacceptable.

\*ELIO® is a registered trademark of Esterline Souriau



One RX Channel Operating from 50Mbps 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 62.5/125µ multimode optical fiber enabling it to interface to either 62.5/125µ or 50/125µ 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 D38999 size 09-01 optical receivers are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

### ORDERING INFORMATION

Application	Part Number
50Mbps to 3.19Gbps	D86J-RS1E-AF
3.2Gbps to 4.25Gbps	D86J-RS1G-AF

See Appendix A2 for more part number options

Single Fiber Sabre Series MIL-DTL-38999 Optical Receiver,  
Arinc 818, 1x/2x/4xFC and sFPDP Applications, Multimode, 850nm

## 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	$T_s$	-65		+100	°C
Supply Voltage	$V_{cc}$	-0.5		+4.5	V

## 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
EN4531	Mating Durability	500 Cycles	<0.5dB Change
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

## MATERIALS

Item	Detail	Notes
EN3645 Shell	Aluminum	
EN3645 Shell Finish	NI, OD-CD or ZN-NI	
Insert	Aluminum	
Optical Ferrules and Alignment Sleeves	Ceramic	
Printed Circuits	FR-4	

Single Fiber Sabre Series MIL-DTL-38999 Optical Receiver,  
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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 4.25Gbps	$P_I$	-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 4.25Gbps	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

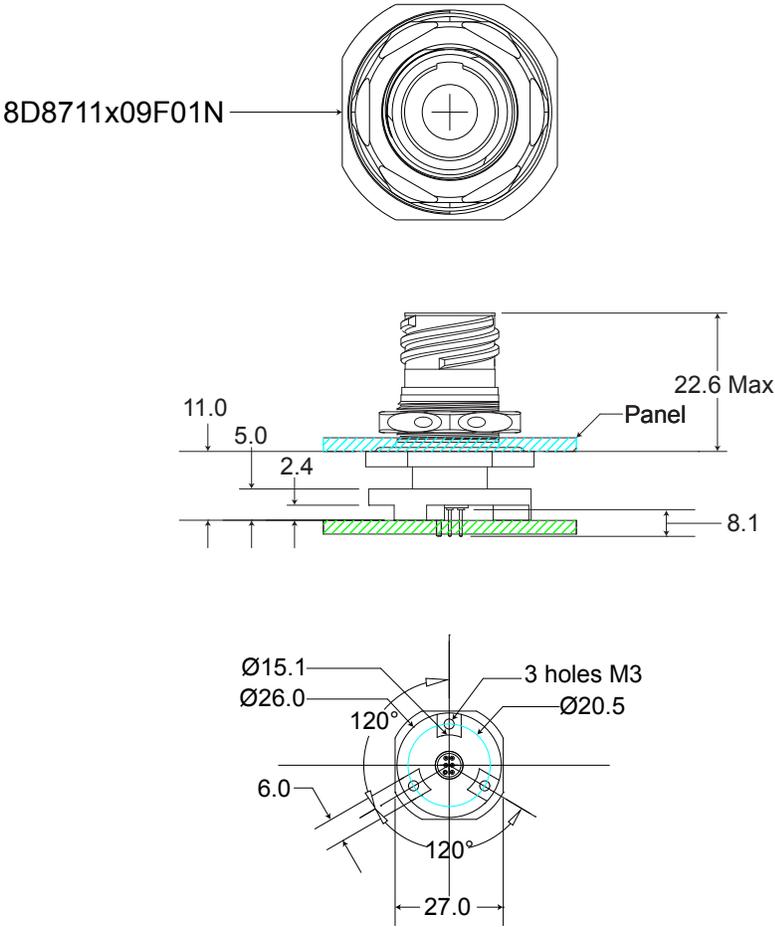
**POWER SUPPLY CURRENT**  $T_A$  = Operating Temperature Range,  $V_{CC}$  = 3.135V to 3.465V

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

Single Fiber Sabre Series MIL-DTL-38999 Optical Receiver,  
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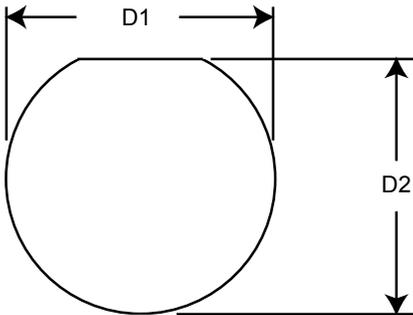
**OUTLINE DRAWING**

Dimensions are shown as: mm



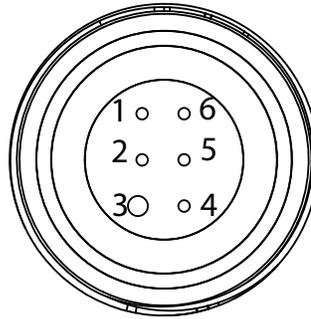
**Panel Cutout Dimensions**

Shell Size Code	Shell Size	D1 Max	D2 Max
A	09	0.710 (18.03)	0.680 (17.27)



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## OPTICAL RECEIVER ELECTRICAL INTERFACE TOP

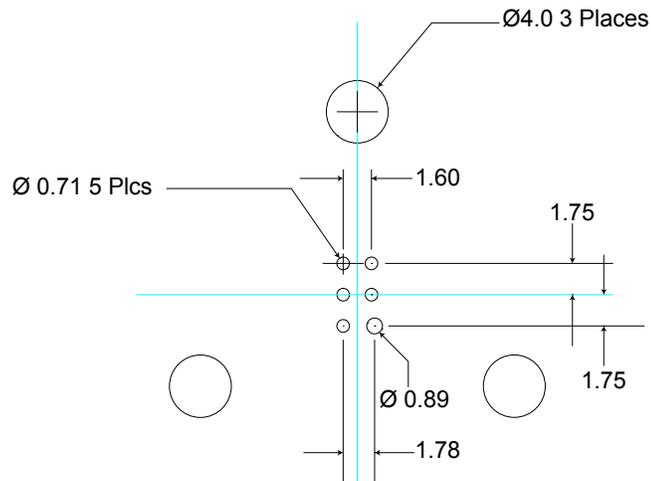


### ELECTRICAL PIN ASSIGNMENTS

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

### PRINTED CIRCUIT BOARD FOOTPRINT

Dimensions are shown as: mm  
PCB Hole Pattern - Mounting Side View



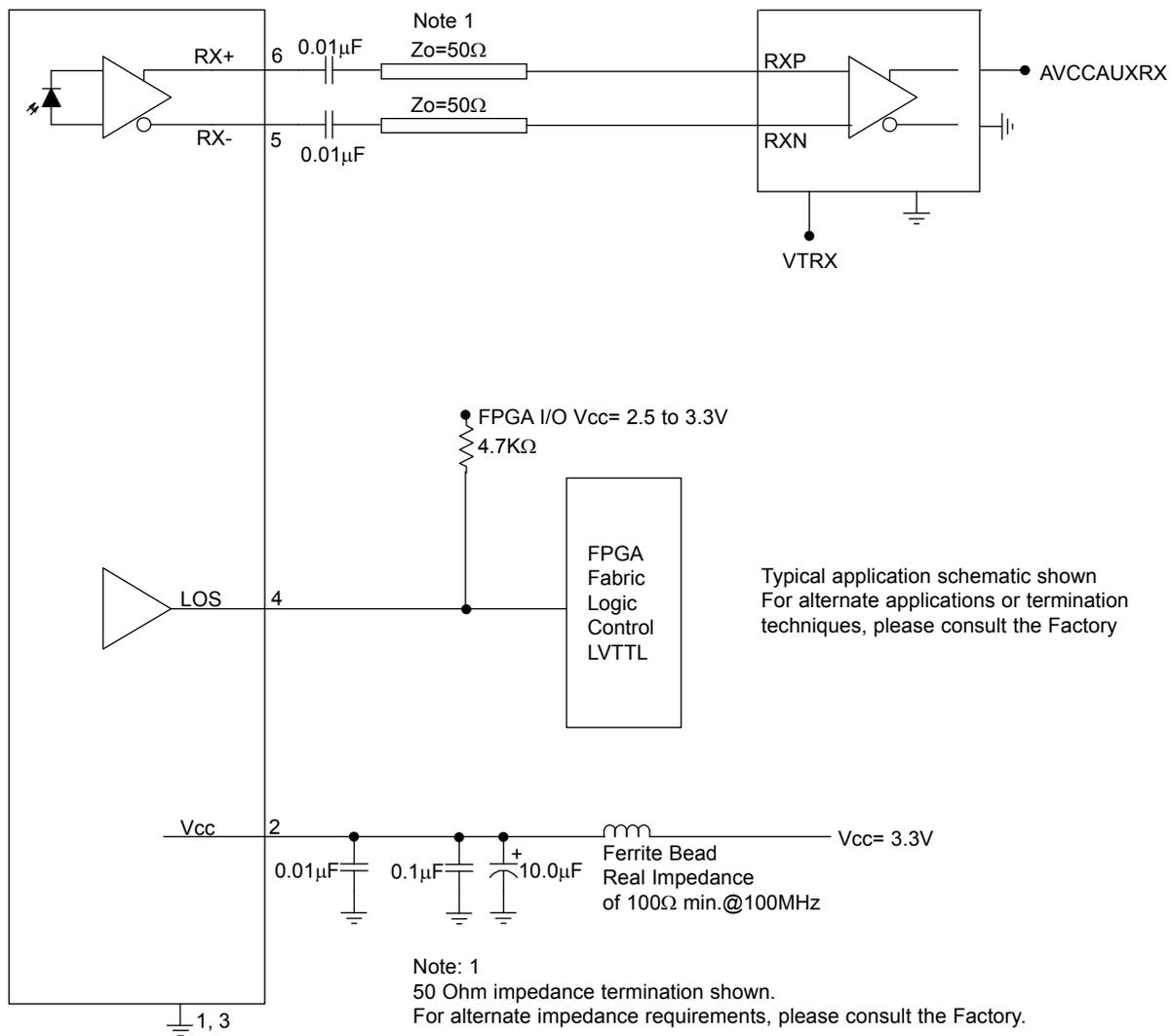
Single Fiber Sabre Series MIL-DTL-38999 Optical Receiver,  
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## APPLICATION SCHEMATIC

For Xilinx Rocket I/O Interfaces

### Optical Receivers

### Xilinx Rocket I/O



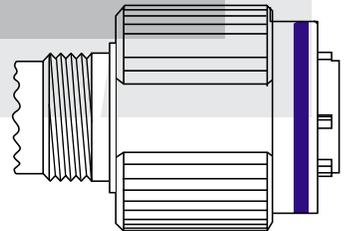
Single Fiber Sabre Series MIL-DTL-38999 Optical Receiver,  
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## APPENDIX A1

### Mating Fiber Optic Connectors and Termini

#### ELIO® Plug Connector

	8D	5	E	09	F	01	A	N
Shell type: 5: Plug								
Designation: E: ELIO® optical connector								
Shell size: 09								
Plating: Aluminum:								
F: Nickel								
Layouts:								
Insert type: A: Male insert								
Polarization: N, A, B, C, D, E,								



#### ELIO® multimode contact Ordering information

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



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

## APPENDIX A2

### PART NUMBER OPTIONS

Sabre Series, Receivers

**D86** **X** - **R** **S** **1** **X** - **A** **X** **X**

Shell Configuration  
D38= 38999 Dual Flange

Shell Configuration  
F= Square Flange  
J= Jam Nut

Function  
R= Receiver

Wavelength  
S= 850nM

Cable Mode  
1= Multimode

Datarate  
E = 0.05 to 3.19Gbps  
G = 3.2 to 4.25Gbps

Shell Size Code  
A = 09-01

Shell Plating  
F = NI  
W = OD CD  
Z = ZN / NI

Polarization  
(leave blank) \_ = N  
A = A  
B = B  
C = C  
D = D  
E = E



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