

Sabre Series

D38999 Size 11-02 Optical Dual Transmitter, PCB Mount, *ELIO®, 850nm, ARINC 818, 803 & 804

Dual TX, Jam Nut

FEATURES

- Compliant with ARINC 818, 803 & 804
- Suitable for 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°C
- Shock and vibration resistant per RTCA / DO-160E
- Olive drab cadmium over electroless nickel plating meets stringent corrosion performance specifications
- Twelve pin PCB footprint with TX-Dis and Tx_Fault functions
- ELIO® 2.5mm ceramic optical fiber ferrule connector interface per EN 4531, ABS 1379 and ARINC 801
- Compatible with Mil-Dtl-38999 ELIO® size 11-02 connectors

APPLICATIONS

Sabre series 38999 size 11-02 optical transmitters enable high speed network communications over long distances in harsh environments.

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

Sabre series 38999 size 11-02 optical dual transmitters 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



Two TX Links Operating from 100Mbps to 4.25Gbps

DESCRIPTION

Sabre series 38999 size 11-02 optical dual transmitters consist of optoelectronic transmitter functions integrated into a wall mount D38999 optical connector with a Souriau D38999 ELIO interface.

The optical transmitters are 850nm VCSEL lasers. The transmitter input lines are driven with differential CML signals applied to the transmitter (TX+ and TX-) lines. Dual loop, temperature compensated, VCSEL drivers convert the transmitter input signals to suitable VCSEL bias and modulation currents.

The optical mating interface of the Sabre series 38999 size 11-02 optical receivers is a Souriau D38999 ELIO® fiber optic cable plug per EN 4531. The electrical interface to the Sabre series D38999 size 11-02 optical transceiver is a 12 position pin header suitable for thru-hole soldering to a flexible or rigid printed circuit.

Sabre series D38999 size 11-02 optical receivers are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

ORDERING INFORMATION

Application	Part Number
100Mbps to 3.19 Gbps	P86J-2T1E-BW
3.2Gbps to 4.25Gbps	P86J-2T1G-BW

See Appendix A3 for more part number options

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
Differential Input Voltage (p-p)	V_D			2.2	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
TX Common Mode Voltage	V_{CM}			2.0	V
TX Differential Input Voltage (p-p)	V_D	0.25		2.2	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	OD-CD, NI or ZN-NI	QQ-P-416, QQ-N-290
Insert	Arcap	
Solder Pins	Brass	
Solder Pin Plating	Gold	
Ferrule	Ceramic	
Printed Circuits	Polyimide / FR-4	

OPTICAL TRANSMITTERS T_A = Operating Temperature Range, V_{CC} = 3.135V to 3.465V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power (BER<10 ⁻¹²)	P_o	-6.5		-1.0	dBm
Optical Output Wavelength	λ_{OUT}	830	850	860	nM
Spectral Width	$\Delta\lambda_{RMS}$			0.85	nM
Extinction Ratio	ER	6.0			dB

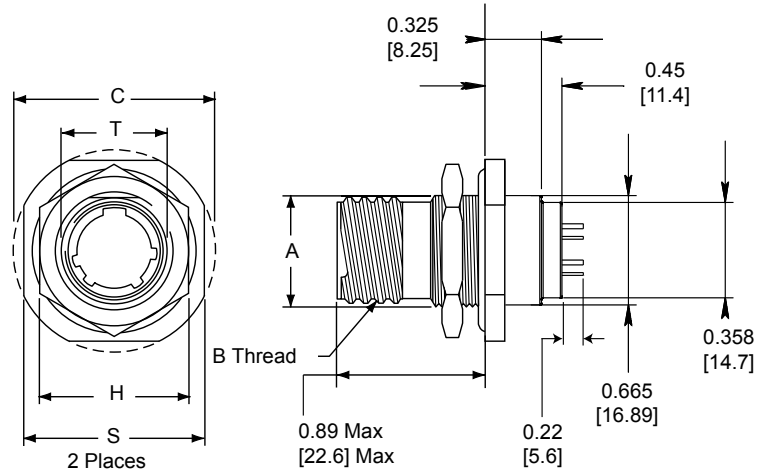
POWER SUPPLY CURRENT T_A = Operating Temperature Range, V_{CC} = 3.135V to 3.465V

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

Sabre Series Mil-Dtl-38999 / ELIO Size 11-02 Optical Dual Transmitter,
Multimode, 850nm, Arinc 664, 818, 803 & 804 Compliant

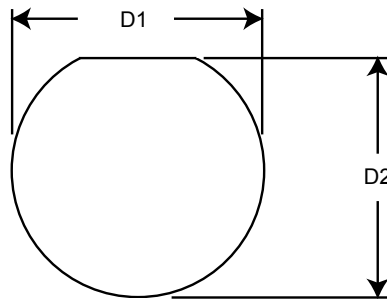
OUTLINE DRAWING

Dimensions are shown as: inches [mm]



Outline Dimensions

Shell Size Code	Shell Size	A +0.000 -0.010	B Thread Class 2A 0.1P-0.3L-TS (Plated)	C Max	H Hex +/-0.010	S +/-0.010	T +0.010 -0.010
B	11	0.769 (19.53)	0.7500	1.386 (35.20)	.998 (25.35)	1.250 (31.75)	0.822 (20.88)



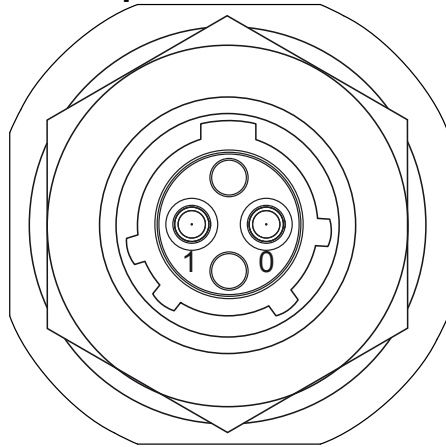
Panel Cutout Dimensions

Shell Size Code	Shell Size	D1 +0.025 / -0.00	D2 +0.00 / -0.25
B	11	0.825 (20.96)	0.770 (19.59)

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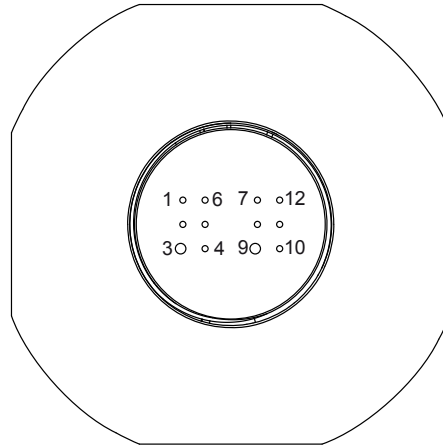
OPTICAL DUAL TRANSMITTER INSERT ARRANGEMENT

TOP
Optical Interface



Front face of the optical dual transmitter insert shown, fiber optic cable plug opposite - see Appendix A2 for details

TOP
Electrical Interface



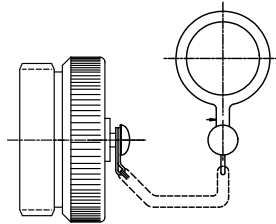
Back face of the optical dual transmitter insert shown - see Printed Circuit Board Footprint and Electrical Pin Assignment pages for details

RECEPTACLE PROTECTION CAPS

*MIL-DTL-38999/33 PROTECTION CAP PART NUMBERS

MS RECEPTACLE CAP P/N

See Appendix A1



*See DSCC or SAE QPL for Approved Suppliers

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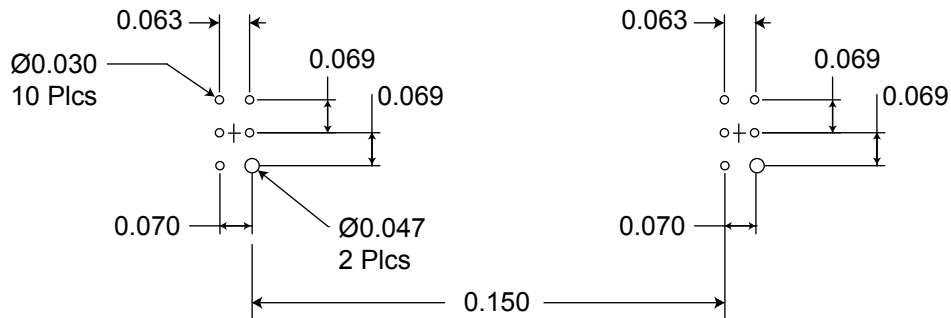
ELECTRICAL PIN ASSIGNMENTS

Pin Number	Port Number	Symbol	Description	Logic Family
1	0	TX_DIS	Transmitt Disable - Input Logic 1: Disable Optical Output Logic 0: Enable Optical Output	CMOS Internal 4.7KΩ to 10.0KΩ pullup / pulldown
2	0	V _{CC}	Power Supply - Input	N/A
3	0	GND	Ground	N/A
4	0	TX_Fault	Internal TX Fault Indicator - Output Satisfactory Operation: Logic "0" Output Internal Fault: Logic "1" Output	Open Drain CMOS
5	0	TX-	Transmitter Data - Input	CML
6	0	TX+	Transmitter Data - Input	CML
7	1	TX_DIS	Transmitt Disable - Input Logic 1: Disable Optical Output Logic 0: Enable Optical Output	CMOS Internal 4.7KΩ to 10.0KΩ pullup / pulldown
8	1	V _{CC}	Power Supply - Input	N/A
9	1	GND	Ground	N/A
10	1	TX_Fault	Internal TX Fault Indicator - Output Satisfactory Operation: Logic "0" Output Internal Fault: Logic "1" Output	Open Drain CMOS
11	1	TX-	Transmitter Data - Input	CML
12	1	TX+	Transmitter Data - Input	CML

PRINTED CIRCUIT BOARD FOOTPRINT

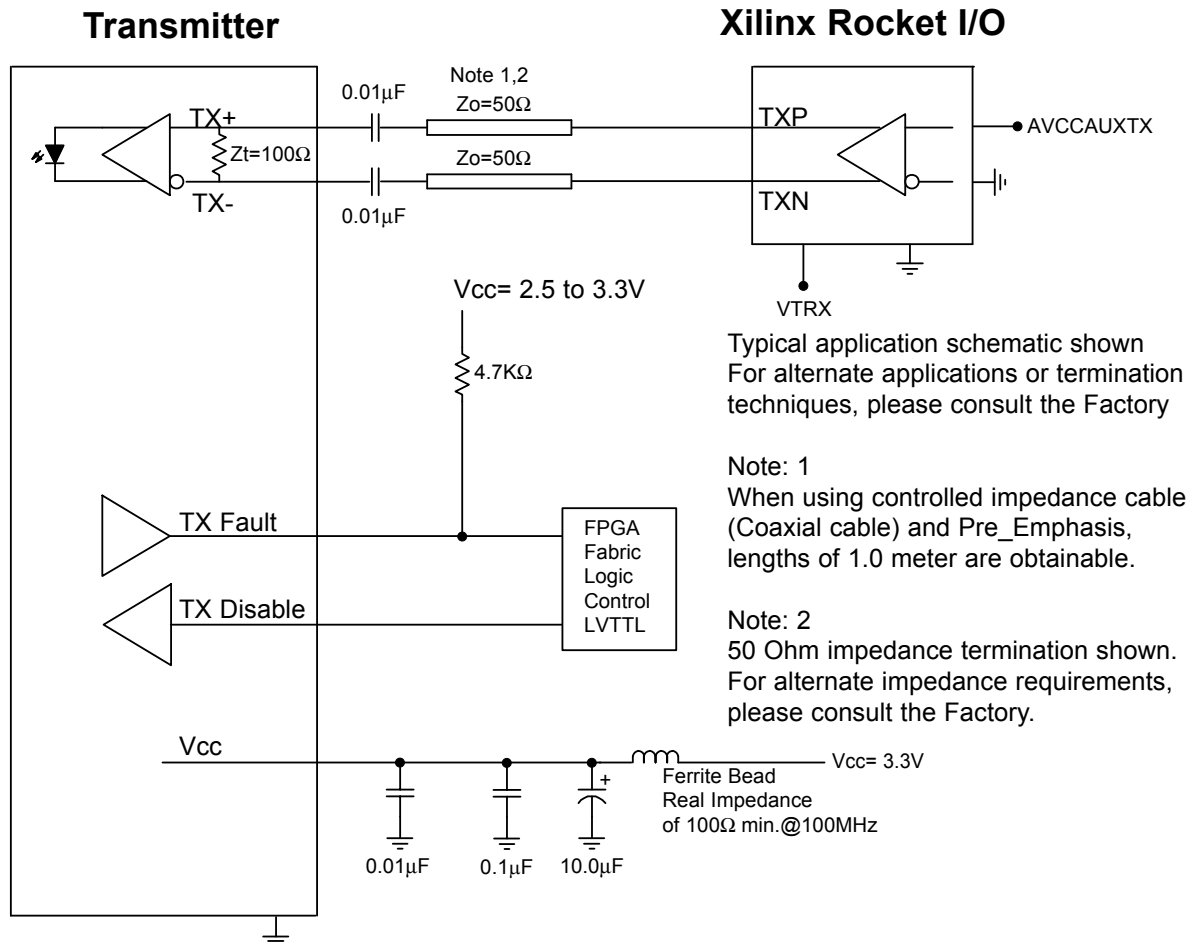
Dimensions are shown as: inches

PCB Hole Pattern Mounting Side View



APPLICATION SCHEMATIC

For Xilinx Rocket I/O Interfaces



APPENDIX A1

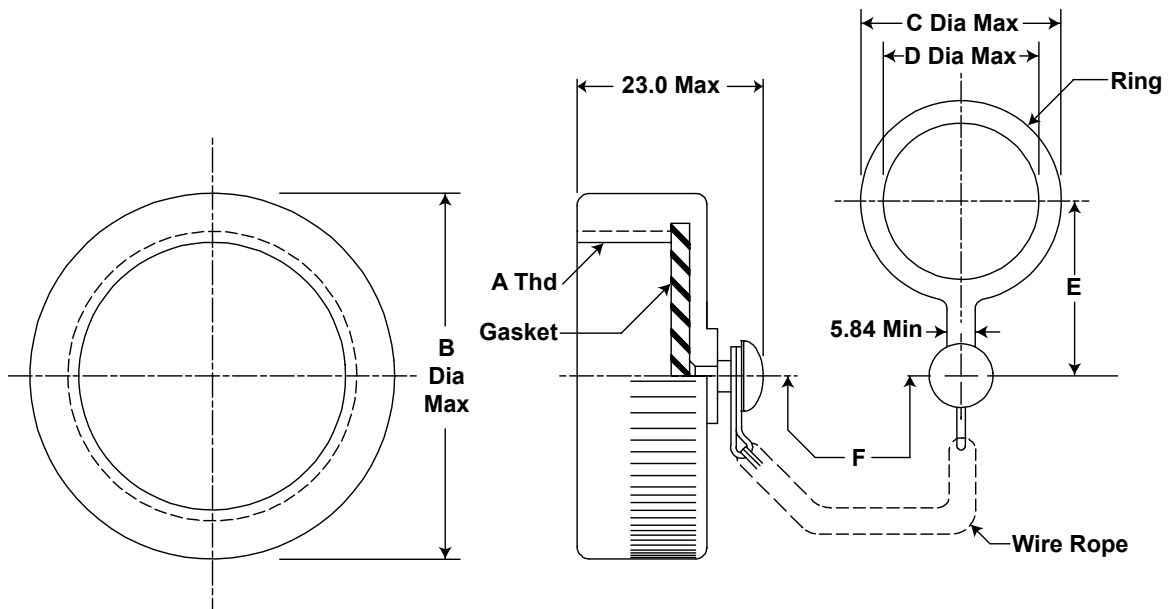
RECEPTACLE PROTECTION CAPS

*MIL-DTL-38999/33 PROTECTION CAP PART NUMBERS

MS RECEPTACLE CAP P/N

*D38999/33x11N

*x = protection class (F, W or Z)

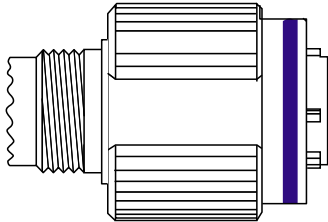


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APPENDIX A1

Mating Fiber Optic Connectors and Termini

ELIO® Plug Connector



	8D	5	E	11	W	02	A	N
Shell type:	5 = Plug							
Designation:	E							
Shell size:	11							
Plating:	W: Olive drab cadmium F: Nickel							
Insert arrangement:	02							
Insert:	Male							
Polarization:	N, A, B, C, D, E							

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					

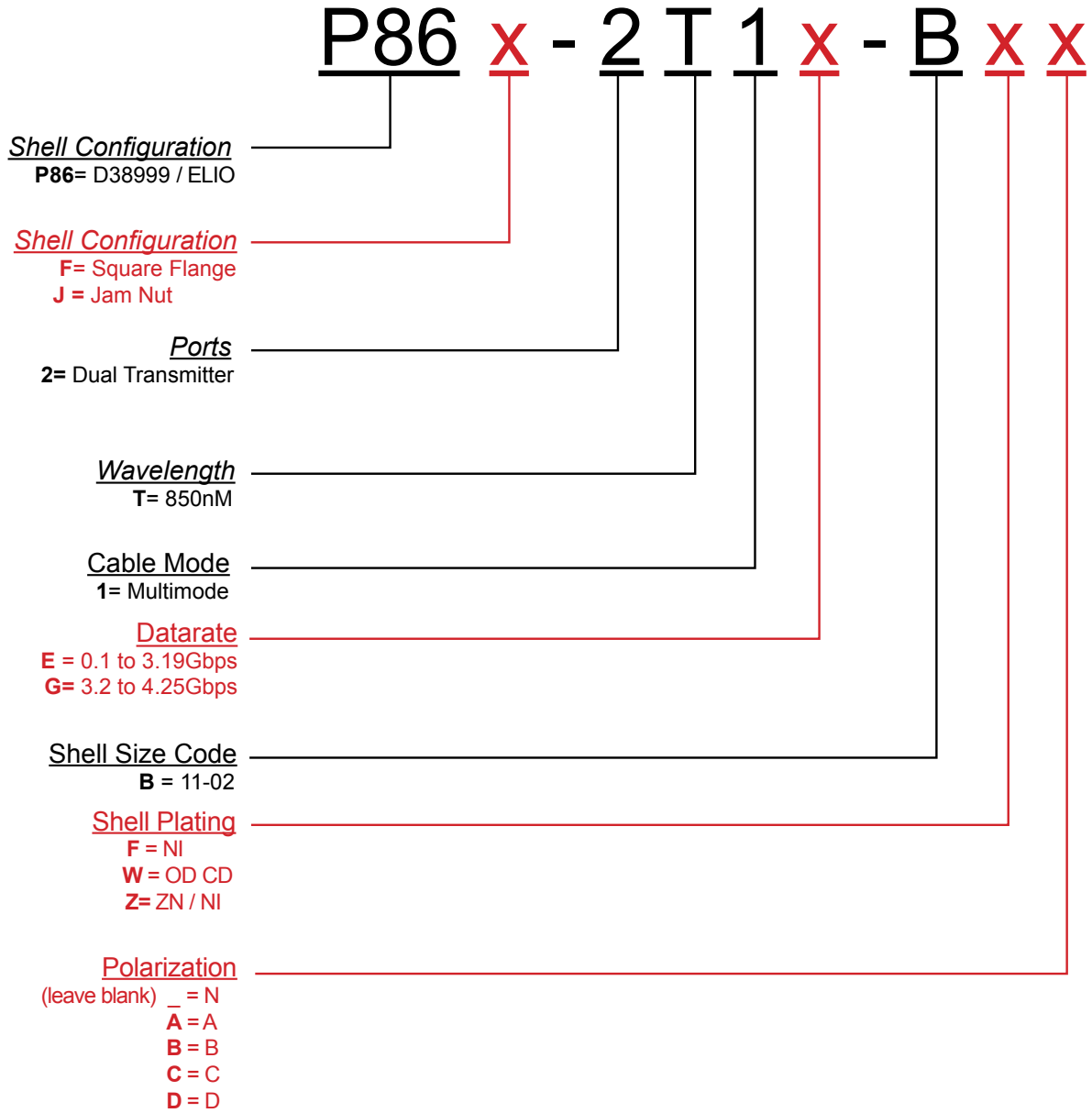


Note: For ABS1379/EN4531 cross reference, please consult us.

APPENDIX A3

PART NUMBER OPTIONS

Sabre 11-02 Series



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



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