

Sabre Series

D38999 Size 09 Optical Transmitter,
PCB Mount, *ELIO[®], 850nm - Arinc
818, 664, 803 & 804 Compliant

Optical Transmitter Unit, Jam Nut Mount

FEATURES

- Compliant with ARINC 664, 818, 803 & 804
- Suitable for Fast Ethernet, Gigabit Ethernet, 1x/2x/4xFibre Channel and sFPDP applications from 125Mbps to 5.0Gbps
- 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 / D0-160E
- Arcap contact insert material meets stringent EMI / RFI / ESD & EMP performance specifications
- Six pin PCB footprint with TX_Fault and TX_Dis functions
- ELIO[®] 2.5mm ceramic optical fiber ferrule connector interface per EN 4531, ABS 1379 and ARINC 801
- Compatible with D38999 Size 09-01 ELIO connectors

APPLICATIONS

Sabre series printed circuit board mounted optical transmitters enable high speed network communications over long distances in harsh environments.

- Fibre Channel switches and peripherals
- Serial Rapid I/O (sRIO) interfaces
- sFPDP data links
- Video displays

This D38999 size 09-01 shell 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 quadrax copper conductors unacceptable.

*ELIO[®] is a registered trademark of Souriau



One TX Channel Operating from 125Mbps to 5.0Gbps

DESCRIPTION

Sabre series D38999 size 09-01 optical transmitters consist of optoelectronic transmitter functions integrated into a wall mounted connector assembly. 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 TX_Fault circuit disables the optical transmitter output when the optical output power or internal current exceeds predefined limits. The fault condition is latched until reset by a toggle of TX_Dis or V_{CC}. A CMOS fault signal is generated on the TX_Fault line upon a transmitter optical or electrical fault condition.

The optical mating interface to the Sabre series D38999 size 09-01 optical transmitters is an ELIO[®] 2.5mm ceramic fiber optic ferrule stub per EN 4531. The ferrule stub has an integral 50/125µ 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 transmitters 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 transmitters are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

ORDERING INFORMATION

Application	Part Number
Fast or Gigabit Ethernet, 1x/2xFC	P86J-TS1D-AW
sFPDP / Arinc 818 @ 2.5 to 3.19Gbps	P86J-TS1E-AW
4xFC	P86J-TS1G-AW

See Appendix A2 for more part number options

Facilitating Secure Communications in Harsh Environments

Single Fiber Sabre Series Mil-Dtl-38999 Optical Transmitter,
Arinc 818, 1x/2xFC and sFPDP Applications, Multimode, 850nm VCSELs

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 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
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	

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

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power (BER10^{-12} xxxx-TS1D-xx @ 1.25Gbps xxxx-TS1D-xx @ 2.125Gbps xxxx-TS1E-xx @ 3.125Gbps xxxx-TS1G-xx @ 4.25Gbps	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	9.0		dB
Optical Modulation Amplitude (p-p) xxxx-TS1D-xx @ 1.25Gbps xxxx-TS1D-xx @ 2.125Gbps xxxx-TS1E-xx @ 3.125Gbps xxxx-TS1G-xx @ 4.25Gbps	OMA	156 196 297 356			μ W

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

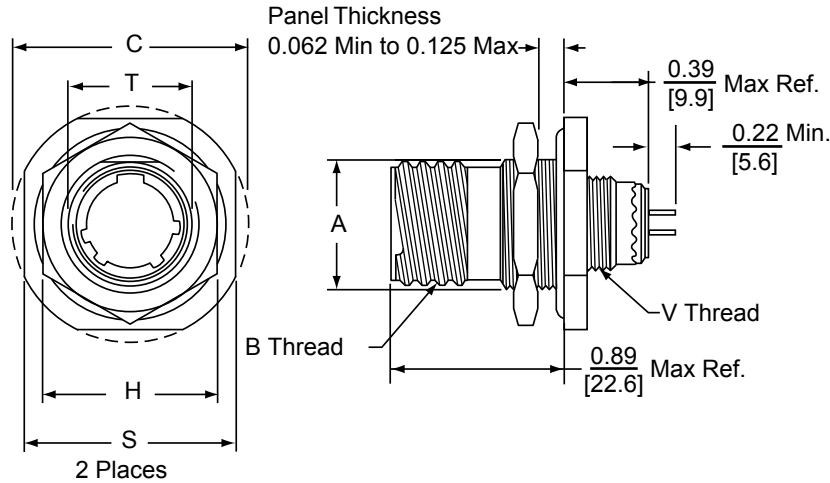
Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current	I_{CCT}		50	95	mA

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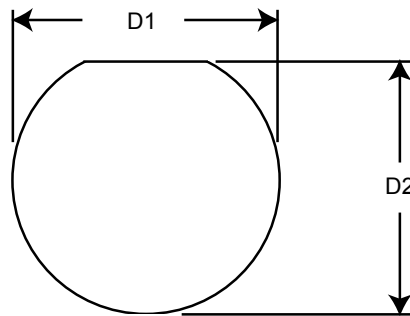
OUTLINE DRAWING

Dimensions are shown as: inches (mm)



Outline Dimensions

Shell Size Code	Shell Size	A Max	B Thread Class 2A 0.1P-0.3L-TS (Plated)	C Max	H Hex	S	T Min	V Metric Thread
A	09	0.669 (16.99)	0.6250	1.199 (30.45)	0.875 (22.23)	1.062 (26.97)	0.697 (17.70)	M12X1-6g



Panel Cutout Dimensions

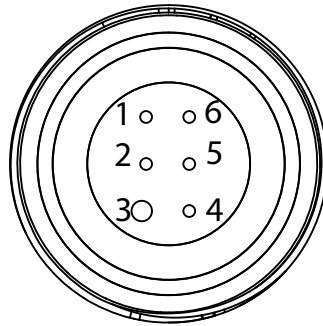
Shell Size Code	Shell Size	D1 Max	D2 Max
A	09	0.710 (18.03)	0.680 (17.27)

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OPTICAL TRANSMITTER ELECTRICAL INTERFACE

TOP



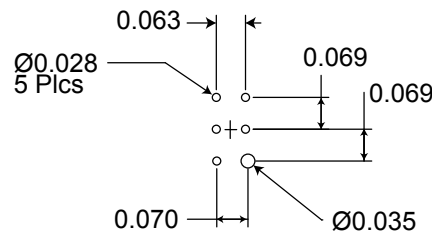
ELECTRICAL PIN ASSIGNMENTS

Pin Number	Symbol	Description	Logic Family
1	TX_DIS	Transmit Disable - Input Logic 1: Disable Optical Output Logic 0: Enable Optical Output	CMOS Internal 4.7KΩ to 10.0KΩ pullup / pulldown
2	V _{cc}	Power Supply	N/A
3	GND	Ground	N/A
4	TX_Fault	Internal TX Fault Indicator - Output Satisfactory Operation: Logic "0" Output Internal Fault: Logic "1" Output	Open Drain CMOS
5	TX-	Transmitter Data Input	SMPTE 259/292M
6	TX+	Transmitter Data Input	SMPTE 259/292M

PRINTED CIRCUIT BOARD FOOTPRINT

Dimensions are shown as: inches

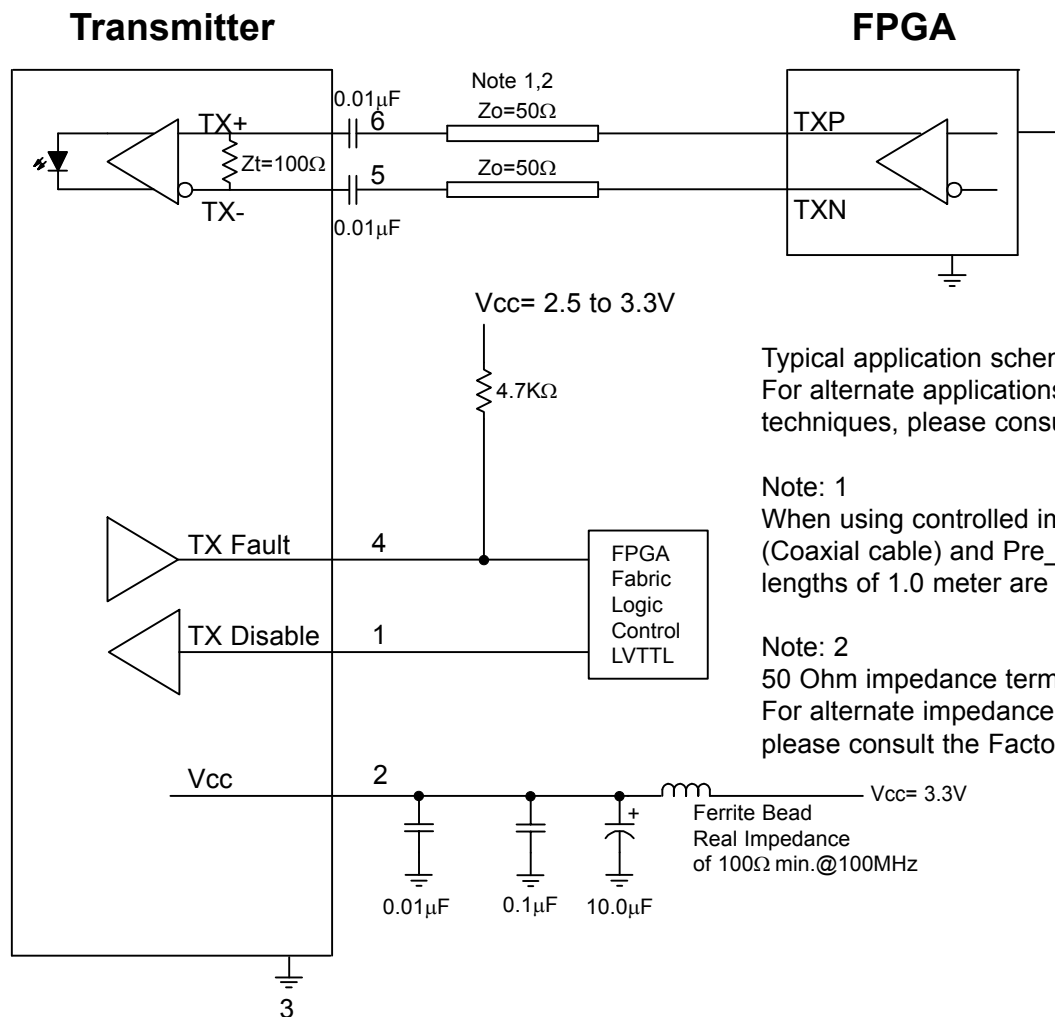
PCB Hole Pattern Mounting Side View



Facilitating Secure Communications in Harsh Environments

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APPLICATION SCHEMATIC



Typical application schematic shown
For alternate applications or termination
techniques, please consult the Factory

Note: 1
When using controlled impedance cable
(Coaxial cable) and Pre_Emphasis,
lengths of 1.0 meter are obtainable.

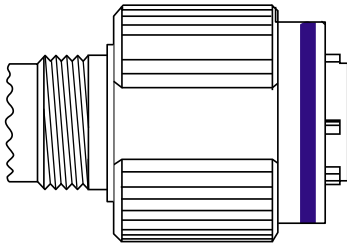
Note: 2
50 Ohm impedance termination shown.
For alternate impedance requirements,
please consult the Factory.

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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



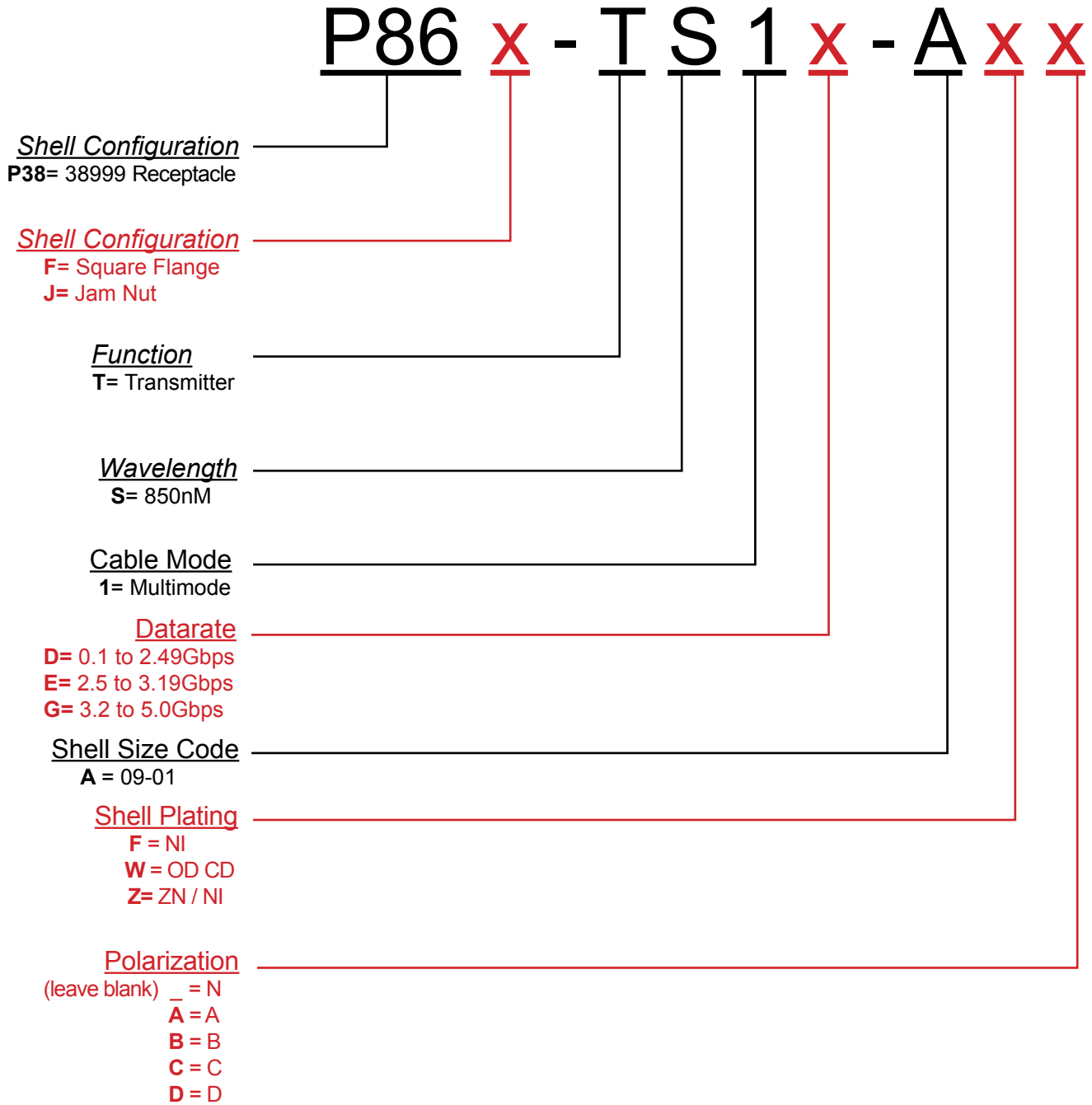
Ordering Information

	Elio	09	N	G	L	A
Cable external diameter:						
09:	0.9 mm or cable wider than 1.9mm with 0.9mm jacket inside					
18:	from 1.5mm to 1.9mm					
Contact sealing:						
W:	waterproof (1.8mm +/- 0.1mm cable only)					
N:	non waterproof					
Fibre type:						
G:	50 or 62,5/125 µm					
D:	100/140 µm					
Boot type:						
L:	Long boot					
S:	Short boot					
N:	No boot (non waterproof version only)					
Contact version index						

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APPENDIX A2 PART NUMBER OPTIONS Sabre Series Transmitters



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