

## DAGGER SERIES

D38999 SIZE 19-18 OPTICAL QUAD RECEIVER, \*ELIO®, ARINC, 850 NM, ARINC 818, 801, 803 AND 804



Dagger series D38999/19-18 optical quad receivers consist of optoelectronic receiver functions integrated into a wall mount D38999 cylindrical connector.

The optical receivers are 850 nm 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 Dagger series D38999/19-18 optical receivers is an ELIO® fiber optic cable plug per EN4531. The electrical interface to the Dagger series optical receivers is a ribbon coax to Samtec EQCD high density cable assembly enabling SMT interconnection to a customer's backplane, motherboard or daughtercard.

Dagger series D38999/19-18 optical receivers are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

# D38999 SIZE 19-18 OPTICAL QUAD RECEIVER, \*ELIO®, 850 NM, ARINC 818, 801, 803 AND 804

Quad RX, Flange or Jam Nut Mount

Four optical RX links operating from 50 Mbps to 4.25 Gbps

## FEATURES

- Compliant with ARINC 818, 803 and 804
- Suitable for 1x/2x/4x Fibre Channel and sFPDP applications from 50 Mbps to 4.25 Gbps
- Maximum optical channel bit error rate less than  $1 \times 10^{-12}$
- Operating temperature range from -40 to +85 °C
- Shock and vibration resistant per RTCA D0-160E
- Electroless nickel plating meets stringent corrosion resistance specifications
- ELIO® 2.5 mm ceramic optical fiber ferrule connector interface per EN 4531, ABS 1379 and ARINC 801

## APPLICATIONS

Dagger series D38999/19-18 optical receivers enable high speed network communications over long distances in harsh environments.

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

Dagger series D38999 size 19-18 optical quad receivers provide a rugged optical interface that is compliant with EN4531 ELIO® 2.5 mm 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 Eaton Souriau

### ORDERING INFORMATION

Application	Part Number
50 Mbps to 3.19 Gbps	P12x-4R1E-Fx-Lxxx
3.2 Gbps to 4.25 Gbps	P12x-4R1G-Fx-Lxxx

See Appendix A2 for more part number options

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## 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

## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	$T_A$	-45		+85	°C
Power Supply Voltage	$V_{cc}$	+3.135		+3.465	V
Power Supply Noise (p-p)	$N_p$			200	mV

## DESIGNED TO SPECIFICATIONS COMPLIANCE

Requirement	Feature	Condition	Notes
RTCA / D0-160E	ESD	Class II	2200 V
RTCA / D0-160E	Vibration	3.8 g2/Hz	43G rms
RTCA / D0-160E	Shock	40.0 g	6-9 ms
RTCA / D0-160E	Flame Resistance	Method 1012	30 sec
RTCA / D0-160E	Damp Heat	10 Cycles	24 hours
EN4531	Mating Durability	500 Cycles	<0.5 dB Change
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

## MATERIALS

Item	Detail	Notes
D38999 Shell	Aluminum	
D38999 Shell Finish	OD-CD, NI or ZN-NI	
Interface Seal	Silicone Elastomer	
Optical Ferrules and Alignment Sleeves	Ceramic	
Printed Circuits	FR-4	

# D38999 SIZE 19-18 OPTICAL QUAD RECEIVER, \*ELIO®, 850 NM, ARINC 818, 801, 803 AND 804

## OPTICAL RECEIVERS $T_A$ = OPERATING TEMPERATURE RANGE, $V_{CC}$ = 3.135V TO 3.465V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity (BER<math>10^{-12}</math>, ER=9.0) xxxx-xx1E-xx @ 50 Mbps to 1.25 Gbps xxxx-xx1E-xx @ 2.125 Gbps xxxx-xx1E-xx @ 2.5 Gbps to 3.19 Gbps xxxx-xx1G-xx @ 3.2 Gbps to 4.25 Gbps	$P_i$	-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-xx1E-xx @ 50 Mbps to 1.25 Gbps xxxx-xx1E-xx @ 2.125 Gbps xxxx-xx1E-xx @ 2.5 Gbps to 3.19 Gbps xxxx-xx1G-xx @ 3.2 Gbps to 4.25 Gbps	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

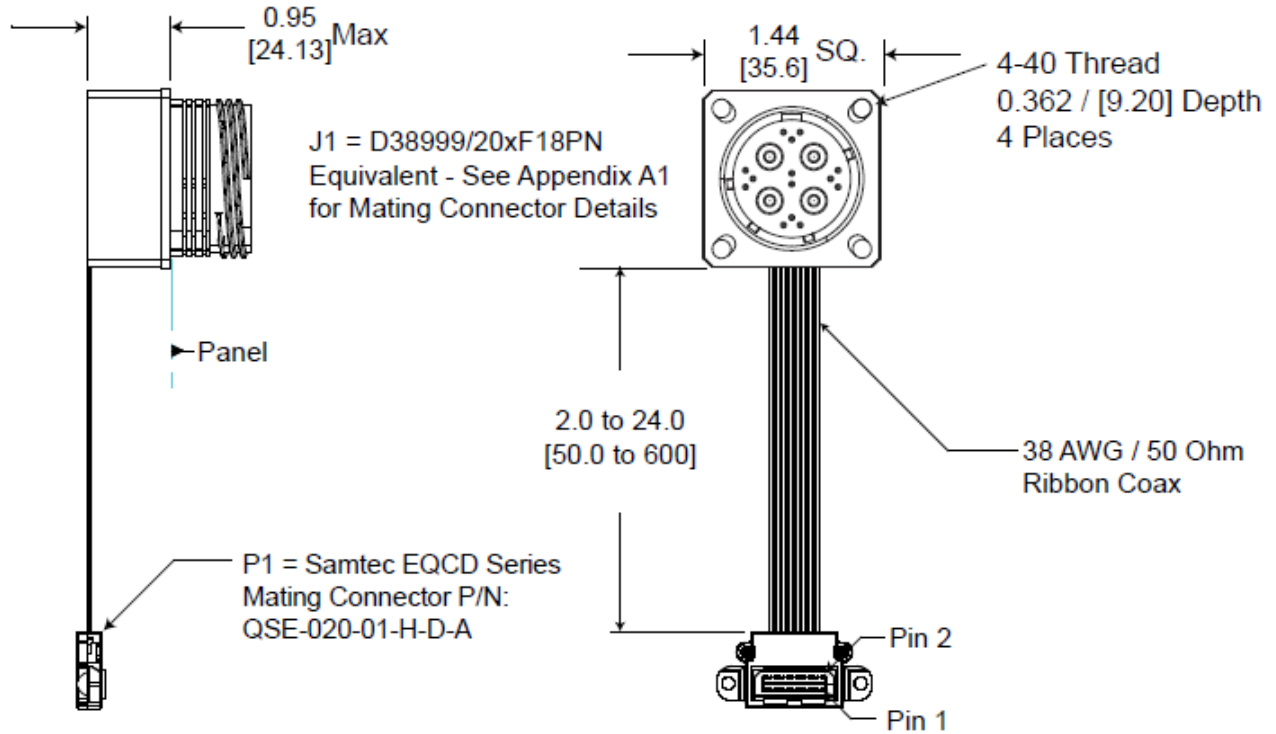
## POWER SUPPLY CURRENT $T_A$ = OPERATING TEMPERATURE RANGE, $V_{CC}$ = 3.135V TO 3.465V

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

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## OUTLINE DRAWING

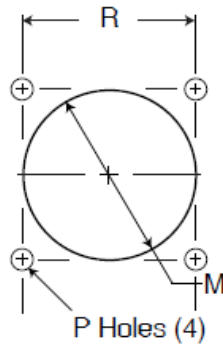
Dimensions are shown as: inches [mm]



## PANEL CUTOUT DIMENSIONS

Rear Panel Mounting Only

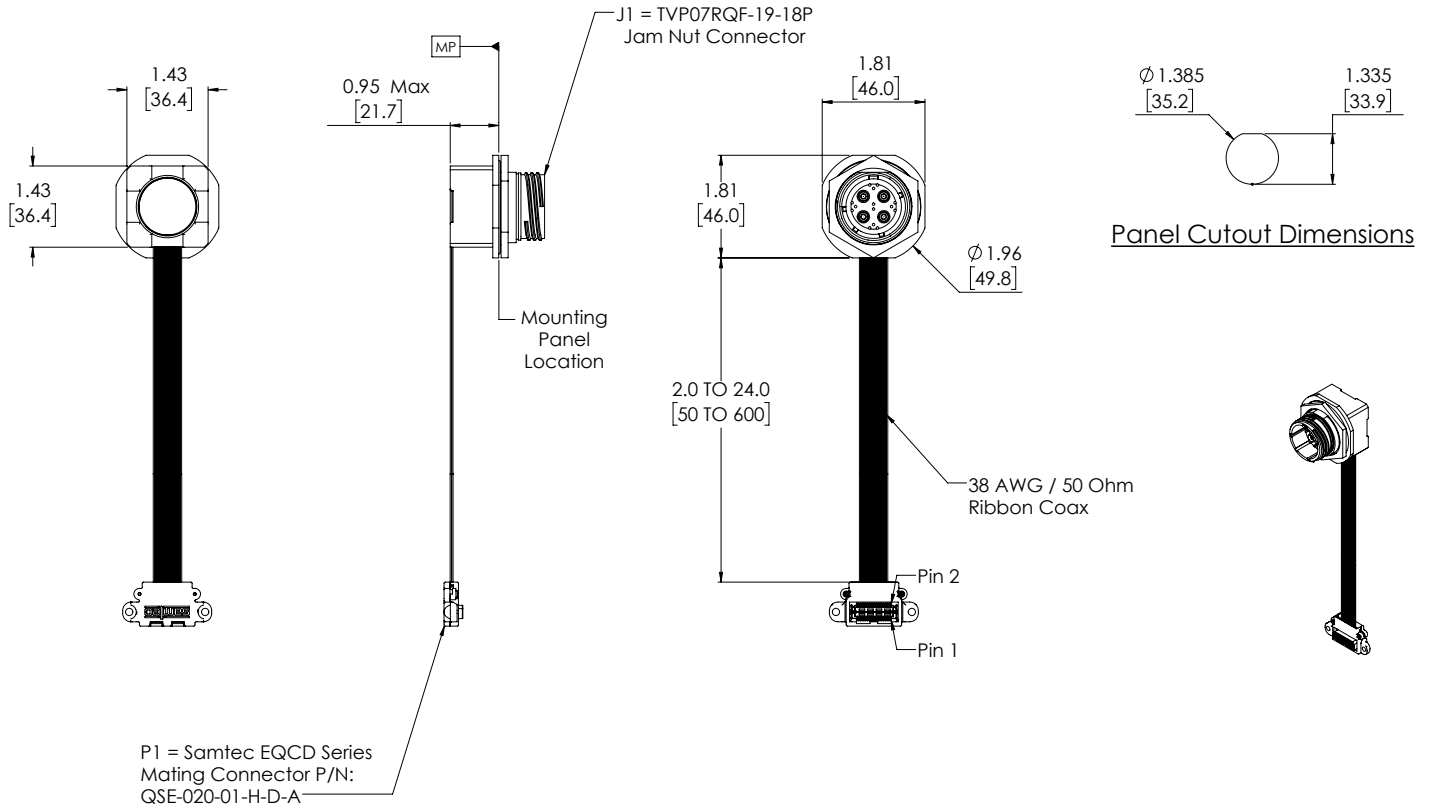
Shell Size Code	Shell Size	M Min	P Holes	R BSC
F	19	1.297 (32.94)	0.133 (3.4) 0.123 (3.1)	1.156 (29.4)



# D38999 SIZE 19-18 OPTICAL QUAD RECEIVER, \*ELIO®, 850 NM, ARINC 818, 801, 803 AND 804

## P12J OUTLINE DRAWING

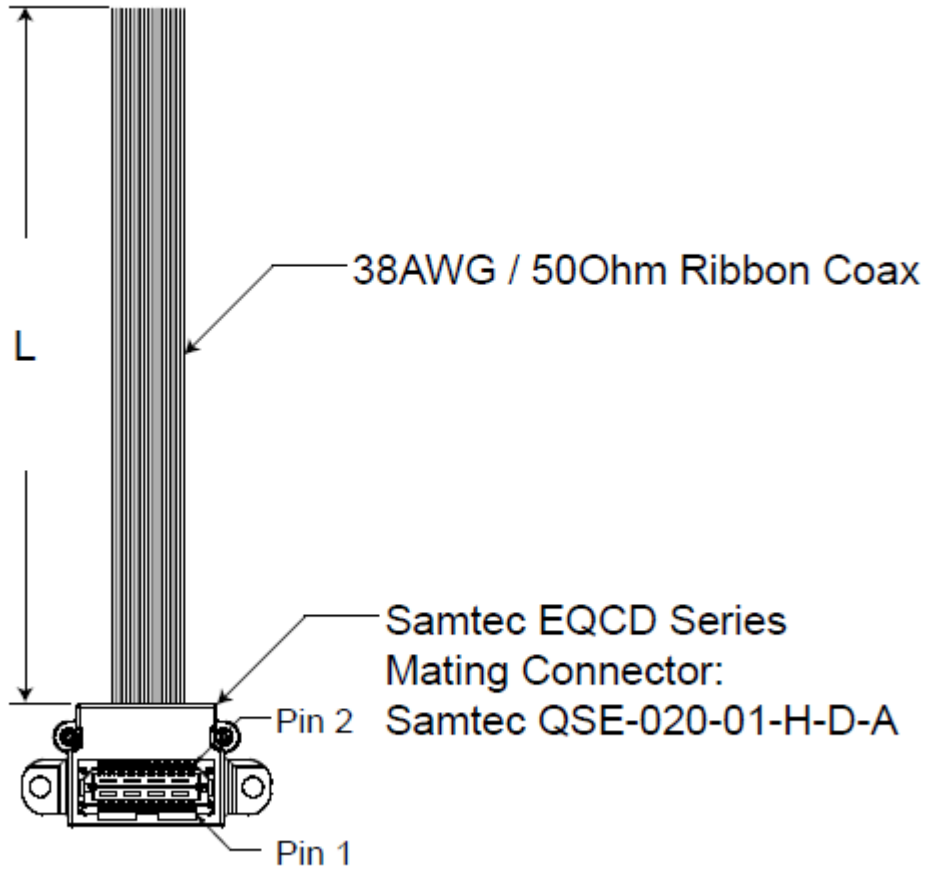
Dimensions are shown as: inches [mm]



# D38999 SIZE 19-18 OPTICAL QUAD RECEIVER, \*ELIO®, 850 NM, ARINC 818, 801, 803 AND 804

## OUTLINE DRAWING

Cable Length Options



### RIBBON COAX CABLE LENGTH OPTIONS

L (mm) +/- 6.0

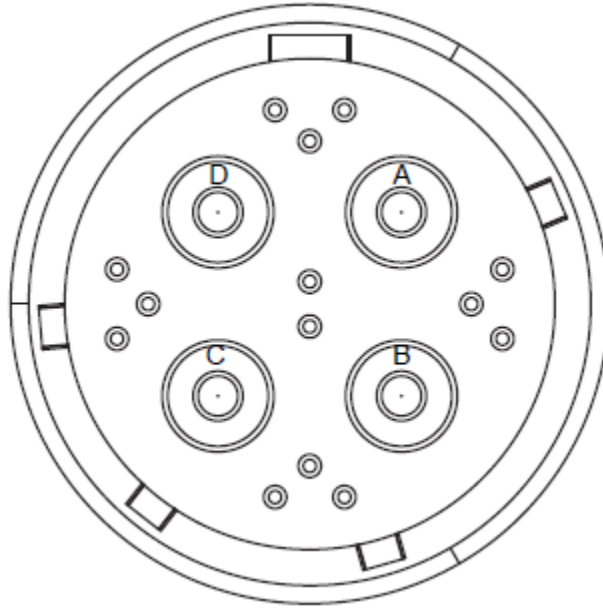
ITEM #

See Appendix A2 on Page 11

# D38999 SIZE 19-18 OPTICAL QUAD RECEIVER, \*ELIO®, 850 NM, ARINC 818, 801, 803 AND 804

## OPTICAL INSERT ARRANGEMENT

TOP  
Optical Interface



Front face of the optical insert shown,  
fiber optic cable plug opposite.  
See Appendix A2 for details

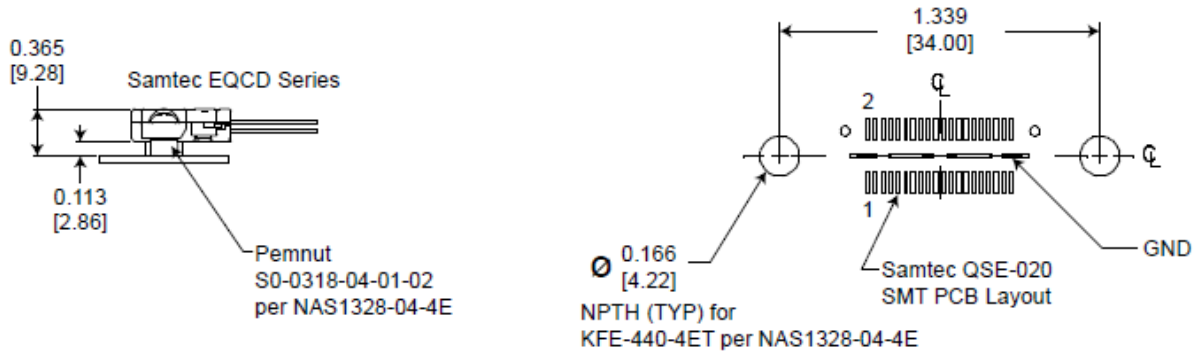
### OPTICAL PORT ASSIGNMENTS Dagger Series D38999/19-18 Optical Interface

D38999 Cavity Code	Logical Port Number	Port Function
A	0	RX
B	1	RX
C	2	RX
D	3	RX

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## PRINTED CIRCUIT BOARD FOOTPRINT

All dimensions shown are for reference only: inches [mm]



## SAMTEC EQCD PIN ASSIGNMENTS

PIN #	Electrical Function	Logic Family	Port #
1	LOS	Open Drain CMOS	0
2	GND	N/A	0-3
3	RX-	CML	0
4	NC	N/A	N/A
5	RX+	CML	0
6	LOS	Open Drain CMOS	1
7	RX-	CML	1
8	V <sub>CC</sub>	3.135 to 3.465VDC	0-3
9	RX+	CML	1
10	V <sub>CC</sub>	3.135 to 3.465VDC	0-3
11	LOS	Open Drain CMOS	2
12	GND	N/A	0-3
13	RX-	CML	2
14	NC	N/A	N/A
15	RX+	CML	2
16	LOS	Open Drain CMOS	3
17	RX-	CML	3
18	V <sub>CC</sub>	3.135 to 3.465VDC	0-3
19	RX+	CML	3
20	V <sub>CC</sub>	3.135 to 3.465VDC	0-3

Center slug is Ground.

For the Loss of Signal (LOS) Functions: Satisfactory Optical Input: Logic "0" Output, Unsatisfactory Optical Input: Logic "1" Output

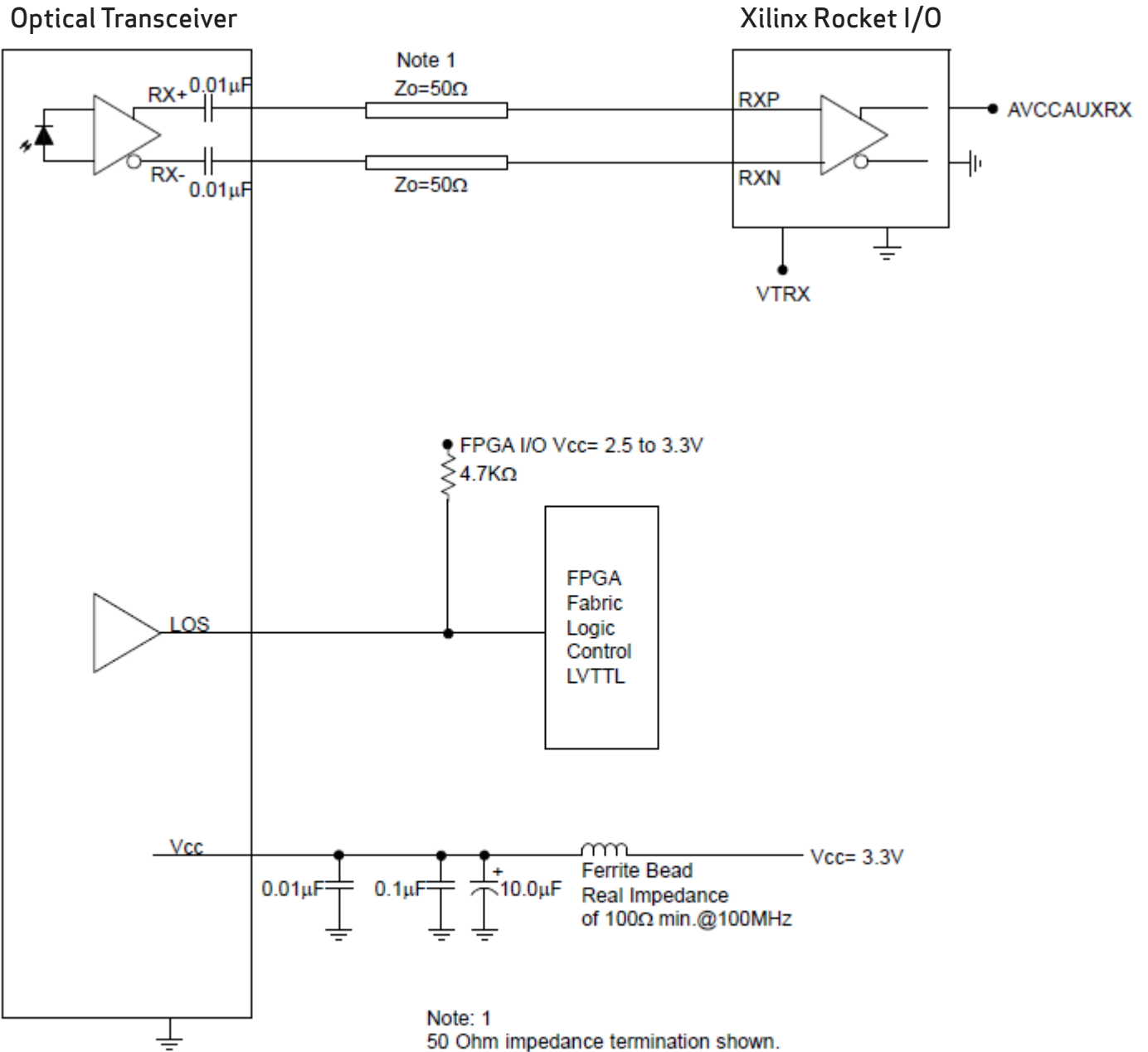
All CML functions are internally AC coupled with 100 $\Omega$  differential termination.

All other pins are NC.

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## APPLICATION SCHEMATIC

For Xilinx Rocket I/O Interfaces



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

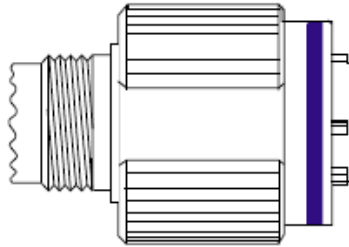
Note: 1  
50 Ohm impedance termination shown.  
For alternate impedance requirements,  
please consult the Factory.

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## APPENDIX A1 Mating Fiber Optic Cable - Plug Configuration

### FIBER OPTIC CABLE PLUG - SOCKET INSERT

Esterline Souriau Part Number = 8D5Q19x84SN621L x = Finish Code



### SIZE 8 CAVITY ADAPTOR FOR ELIO TERMINI

Esterline Souriau Part Number = ELIOAQ6SB



### EASTON SOURIAU ELIO TERMINI

#### ELIO® contact - Ordering information

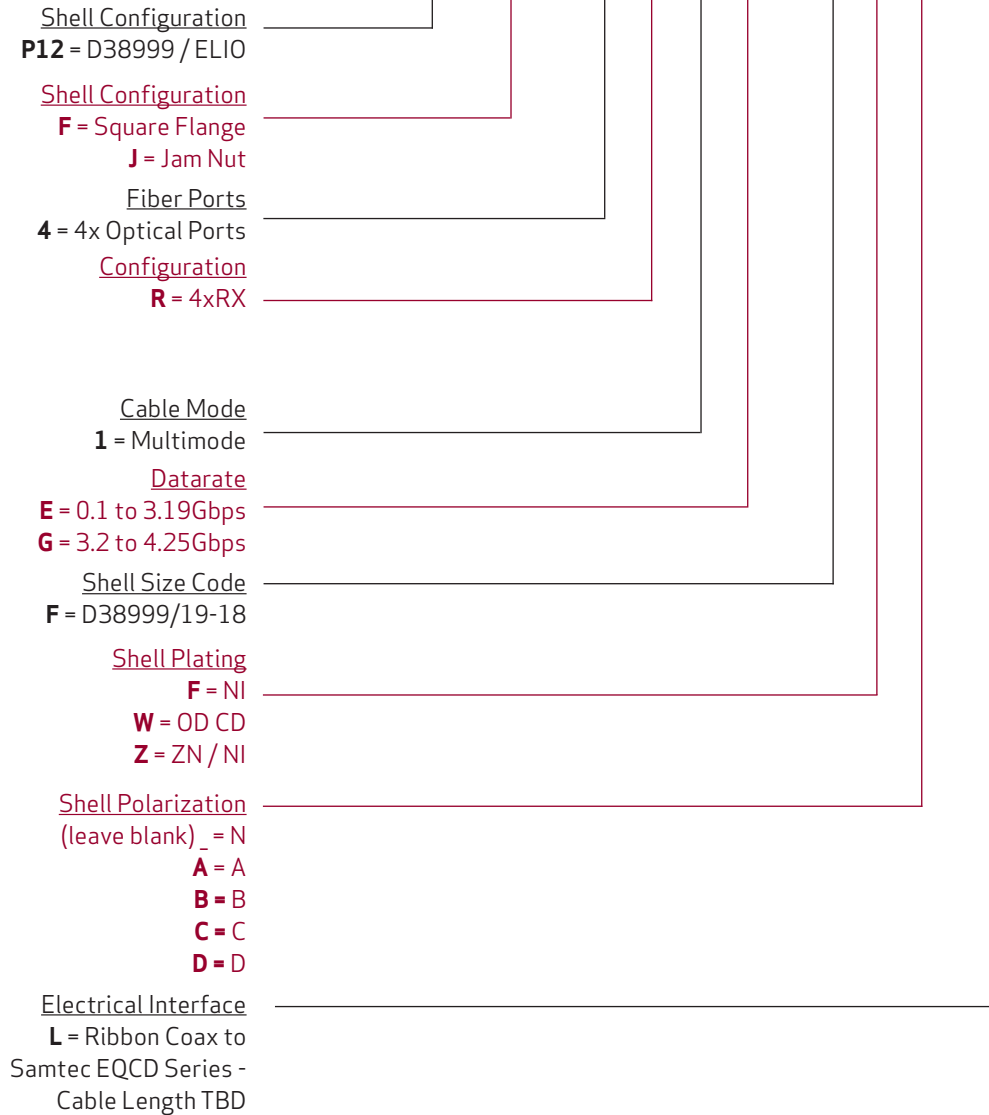
	ELIO	09N	G	L	A
<b>Cable external diameter &amp; Contact sealing:</b>					
09N: 0.9 <sup>+0.1</sup> mm. Non waterproof					
18N: from 1.5mm to 1.9mm. Non waterproof					
18W: 1.8 <sup>+0.1</sup> mm. Waterproof					
20N: from 1.7mm to 2.1mm. Non waterproof					
20W: 2.0 <sup>+0.1</sup> mm. Waterproof					
<b>Fibre type:</b>					
G: ELIO® Multimode fibre, 50/125 or 62.5/125					
E: ELIO® Singlemode 9/125, PC polish					
<b>Boot type:</b>					
L: Long boot					
S: Short boot					
N: No boot (non waterproof version only)					
<b>Contact version index</b>					

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## APPENDIX A2 PART NUMBER OPTIONS

Dagger D38999/19-18 Series

**P12 x - 4 R 1 x - F x x - L**



# MOOG

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