

# 5Gbps Dagger Series

D38999 Size 19-18 Dual Port  
Optical Transceiver, 850nm,  
ARINC 818, 801, 803 & 804

Dual Port, Flange Mount

## FEATURES

- Compliant with ARINC 818, 803 & 804
- Maximum optical channel bit error rate less than  $1 \times 10^{-12}$
- Suitable for Gigabit Ethernet
- 1x/2x/4xFibre Channel and sFPDP applications from 1.25Gbps to 5.0Gbps
- Operating temperature range from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Shock and vibration resistant per RTCA / D0-160E
- Electroless nickel plating meets stringent corrosion resistance specifications, along with other plating options
- 1.25mm ceramic optical fiber ferrule connector interface per ARINC 801

## APPLICATIONS

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

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

Dagger series D38999 size 19-18 optical dual transceivers provide a rugged optical interface that is compliant with ARINC801 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.



Two duplex optical links operating up to 5Gbps

## DESCRIPTION

Dagger series D38999/19-18 optical dual transceivers consist of optoelectronic transmitter and receiver functions integrated into a wall mount D38999 cylindrical connector.

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 receivers consist of PIN and preamplifier assemblies and limiting post-amplifiers. Outputs from the receivers consist of differential CML data signals on the receiver (RX+ and RX-) lines and single ended CMOS indicator functions on the Loss of Signal (LOS) lines. The receiver data lines are squelched upon LOS assertion, preventing errant data generation when an invalid incoming optical signal is presented to the transceiver.

The optical mating interface of the Dagger series D38999/19-18 optical transceiver is an ARINC801 compliant interface. The electrical interface to the Dagger series optical transceivers 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 transceivers are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

## ORDERING INFORMATION

Application	Part Number
Up to 5Gbps	P13x-4S1K-Fx-Lxxx
See Appendix A2 for more part number options	

5Gbps Dagger Series D38999/19-18 Dual Port Optical Transceiver,  
Multimode, 850nm, ARINC 664, 818, 801, 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

### RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	$T_A$	-40		+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
D38999 Shell	Aluminum	
D38999 Shell Finish	NI, OD-CD or ZN-NI	
Interface Seal	Silicone Elastomer	
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 (BER<10 <sup>-12</sup> )	$P_o$	-6.5		-1.0	dBm
Optical Output Wavelength	$\lambda_{OUT}$	840	850	860	nM
Extinction Ratio	ER	3.0			dB

**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)	$P_I$	-14.0		0.0	dBm
Optical Wavelength	$\lambda_{IN}$	840	850	860	nM
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

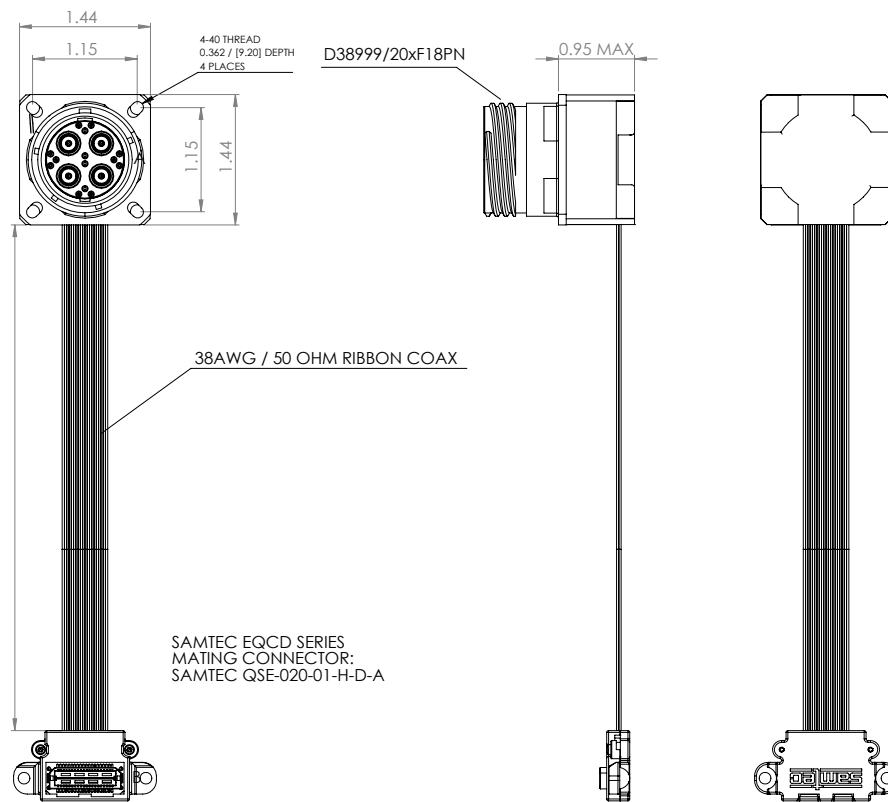
**POWER SUPPLY CURRENT**  $T_A$  = Operating Temperature Range,  $V_{CC}$  = 3.135V to 3.465V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current per transmitter or receiver	$I_{CCT}$		85	100	mA

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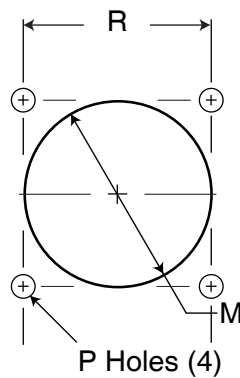
**OUTLINE DRAWING**

Dimensions are shown as: inches [mm]



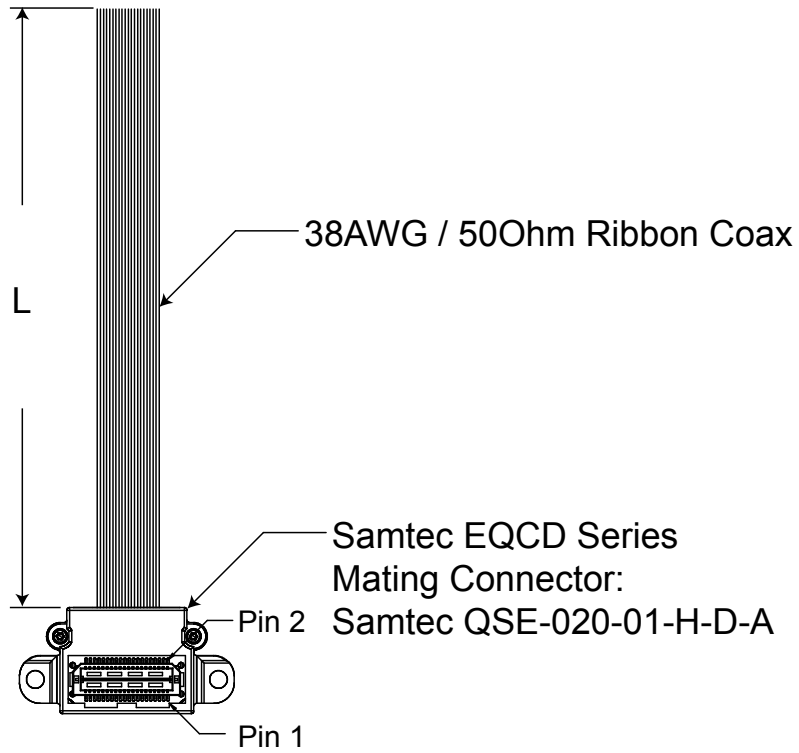
**Panel Cutout Dimensions**  
Rear Panel Mounting Only

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)



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### OUTLINE DRAWING Cable Length Options



### Ribbon Coax Cable Length Options

L (mm) +/- 6.0	ITEM #
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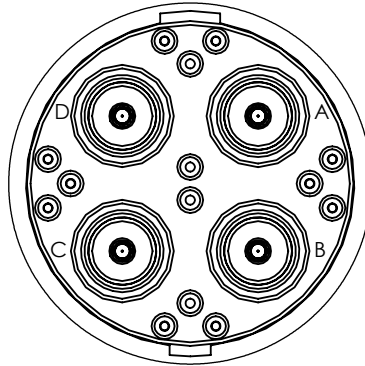
See available cable length options in Appendix 2

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## 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

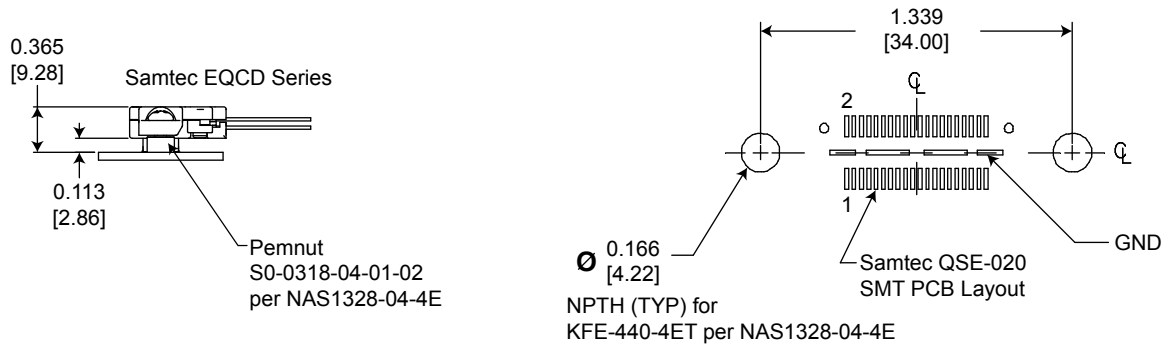
Dagger Series D38999/19-18 Optical Interface

D38999 CAVITY CODE	LOGICAL PORT NUMBER	PORT FUNCTION
A	0	RX
B	0	TX
C	1	RX
D	1	TX

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**PRINTED CIRCUIT BOARD FOOTPRINT**

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



**SAMTEC EQCD PIN ASSIGNMENTS**

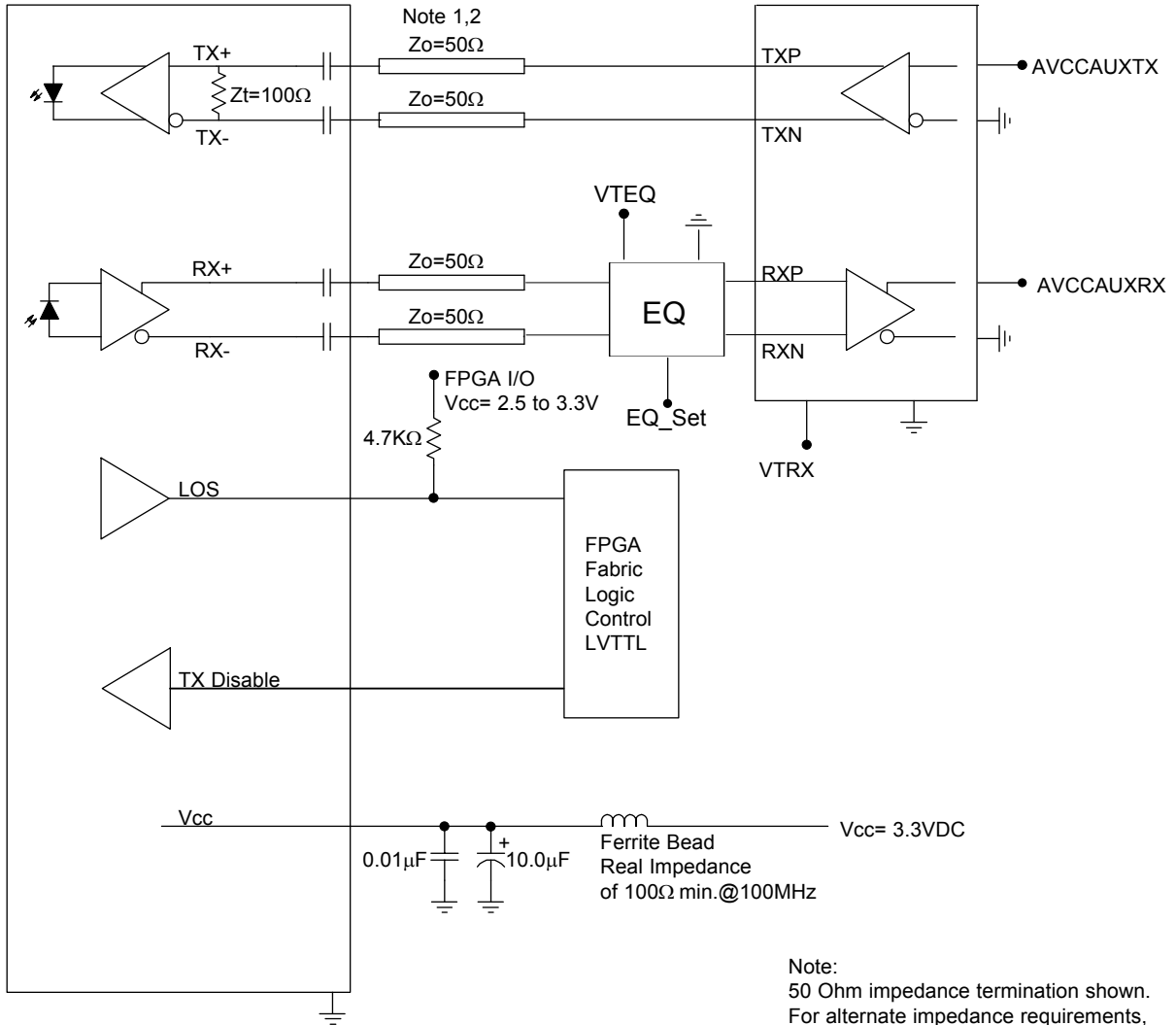
PIN	FUNCTION	PORT		PIN	FUNCTION	PORT
1	GND	ALL		2	GND	ALL
3	RX+	0		4	LOS	0
5	RX-	0		6	TX_DIS	0
7	GND	ALL		8	GND	ALL
9	GND	ALL		10	VCC	ALL
11	GND	ALL		12	VCC	ALL
13	GND	ALL		14	GND	ALL
15	TX-	0		16	LOS_0	1
17	TX+	0		18	TX_DIS	1
19	GND	ALL		20	GND	ALL
21	GND	ALL		22	VCC	ALL
23	RX+	1		24	VCC	ALL
25	RX-	1		26	GND	ALL
27	GND	ALL		28	NC	-
29	GND	ALL		30	NC	-
31	GND	ALL		32	NC	-
33	GND	ALL		34	NC	-
35	TX-	1		36	NC	-
37	TX+	1		38	NC	-
39	GND	ALL		40	NC	-

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**APPLICATION SCHEMATIC**  
For Xilinx Rocket I/O Interfaces

**Optical Transceiver**

**Xilinx Rocket I/O**



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

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



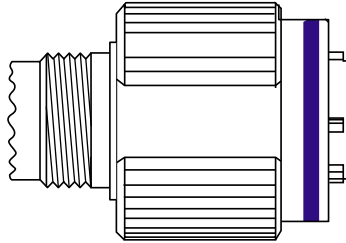
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## APPENDIX A1

### Mating Fiber Optic Cable - Plug Configuration

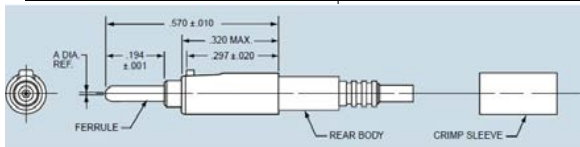
#### FIBER OPTIC CABLE PLUG - SOCKET INSERT

ESTERLINE SOURIAU PART NUMBER = 8D5Q19x84SN621L    x = Finish Code



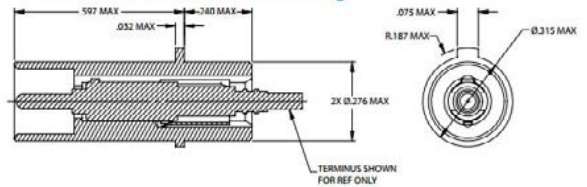
#### FIBER OPTIC TERMINUS

##### ARINC 801 TERMINUS



\*\*defined by fiber optic cable configuration  
\*\*\*Amphenol part number CF-198148-126

##### ARINC 801 Size 8 Cavity Reducer



\*\*defined by fiber optic cable configuration  
\*\*\*Amphenol part number FRPA6000

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## APPENDIX A2

### PART NUMBER OPTIONS

Dagger D38999/19-18 Series

**P13** **x** - **4** **x** **1** **K** - **F** **x** **x** - **L**

Shell Configuration  
P13= D38999

Shell Configuration  
F= Square Flange  
J= Jam Nut

Fiber Ports  
4= 4x Optical Ports

Configuration  
R = 4xRX  
S = 2xTX + 2xRX  
T = 4xTX

Cable Mode  
1= Multimode

Datarate  
K = 5Gbps

Shell Size Code  
F = D38999/19-18

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

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

Electrical Interface  
L = Ribbon Coax to  
Samtec EQCD Series -  
Cable Length TBD



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