

Cutlass Series

D38999 Size 13-04 Optical Transceiver, PCB Mount, 850nm, ARINC 801, 818, 803 & 804

Single Port, Jam Nut

FEATURES

- Compliant with ARINC 801, 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
- Electroless nickel plating meets stringent corrosion performance specifications
- Twelve pin PCB footprint with TX-Dis, Tx_Fault and LOS functions
- 1.25mm ceramic optical fiber ferrule connector interface per ARINC 801
- Compatible with MIL-DTL-38999 size 13-04 connectors

APPLICATIONS

Cutlass series D38999 size 13-04 optical transceivers enable high speed network communications over long distances in harsh environments.

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

Cutlass series D38999 size 13-04 optical transceivers provide a rugged optical interface that is compliant with ARINC 801 / Luxcis® 1.25mm 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.

*Luxcis® is a registered trademark of Radiall SA



One Duplex Channel Operating from 50Mbps to 4.25Gbps

DESCRIPTION

Cutlass series 38999 size 13-04 optical transceivers consist of optoelectronic receiver and transmitter functions integrated into a wall mount D38999 optical 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. The TX_Fault circuit disables the optical transmitter output when the optical output power or internal current exceeds predefined limits. A CMOS fault signal is generated on the TX_Fault line upon a transmitter optical or electrical fault condition. The fault signal is latched until reset by a toggle of TX_Dis or VCC.

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 Cutlass series D38999 size 13-04 optical receivers is a D38999 fiber optic cable plug per ARINC 801. The electrical interface to the Cutlass series D38999 size 13-04 optical transceiver is a 12 position pin header suitable for thru-hole soldering to a flexible or rigid printed circuit. Cutlass series D38999 size 13-04 optical transceivers are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

ORDERING INFORMATION

Application	Part Number
50Mbps to 2.49 Gbps	P85J-2x1D-CF
0.1Gbps to 3.19Gbps	P85J-2x1E-CF
3.2Gbps to 4.25Gbps	P85J-2x1G-CF

See Appendix A1 for more part number options

Cutlass Series MIL-DTL-38999 / Size 13-04 Single Port Transceiver,
Multimode, 850nM, Arinc 664, 801, 818, 803 & 804

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
D38999 Shell	Aluminum	
D38999 Shell Plating	ZN, OD-CD or ZN-NI	QQ-P-416, QQ-N-290
D38999 Insert	Arcap	
Solder Pins	Brass	
Solder Pin Plating	Gold	
Ferrule	Ceramic	
Printed Circuits	Polyimide / FR-4	

Cutlass Series MIL-DTL-38999 / Size 13-04 Single Port
Transceiver, Multimode, 850nM, Arinc 664, 801, 818, 803 & 804

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

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

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity (BER<10 ⁻¹² , ER=9.0) xxxx-xx1E-xx @ 100Mbps to 1.25Gbps xxxx-xx1E-xx @ 2.125Gbps xxxx-xx1E-xx @ 2.5Gbps to 3.19Gbps xxxx-xx1G-xx @ 3.2Gbps to 4.25Gbps	P_i	-17.0 -15.0 -15.0 -14.0		0.0	dBm
Optical Wavelength	λ_{IN}	830		860	nM

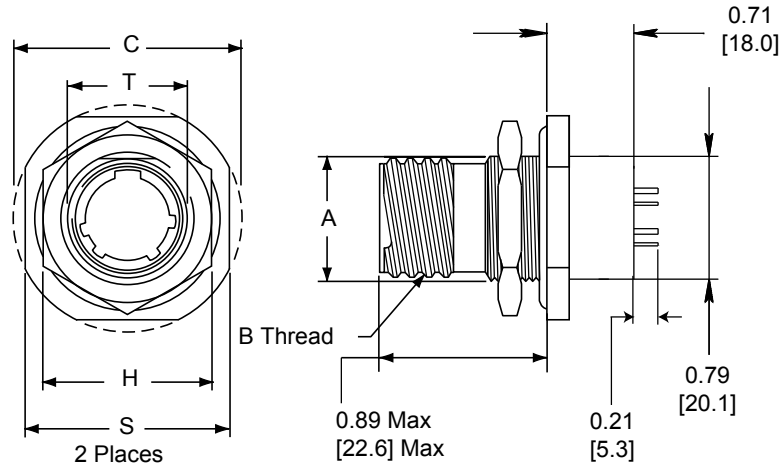
POWER SUPPLY CURRENT T_A = Operating Temperature Range, V_{CC} = 3.135V to 3.465V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current	I_{CCT}		165	200	mA

Cutlass Series MIL-DTL-38999 / Size 13-04 Single Port
 Transceiver, Multimode, 850nM, Arinc 664, 801, 818, 803 & 804

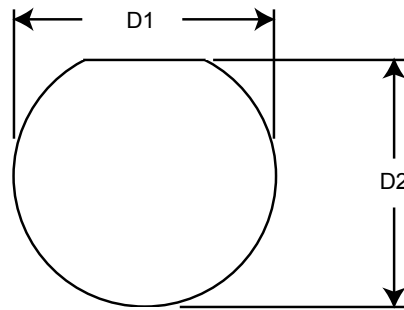
OUTLINE DRAWING

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 +0.017 -0.016	S +/-0.010	T +0.010 -0.010
C	13	0.955 (24.26)	0. .8750	1.511 (38.38)	1.188 (30.18)	1.375 (34.93)	1.007 (25.58)



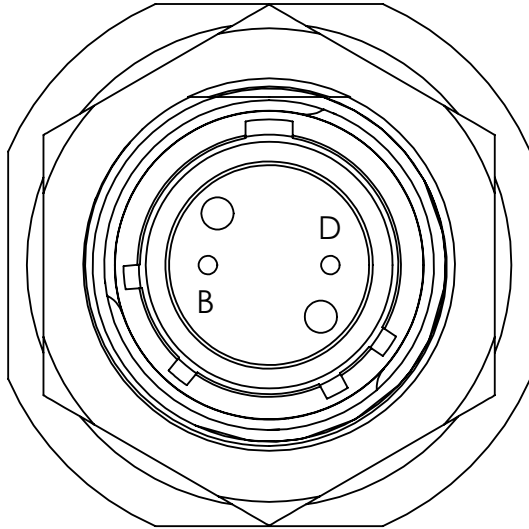
Panel Cutout Dimensions

Shell Size Code	Shell Size	D1 +0.025 / -0.00	D2 +0.00 / -0.25
C	13	1.010 (25.65)	0.955 (24.26)

Cutlass Series MIL-DTL-38999 / Size 13-04 Single Port
 Transceiver, Multimode, 850nm, Arinc 664, 801, 818, 803 & 804

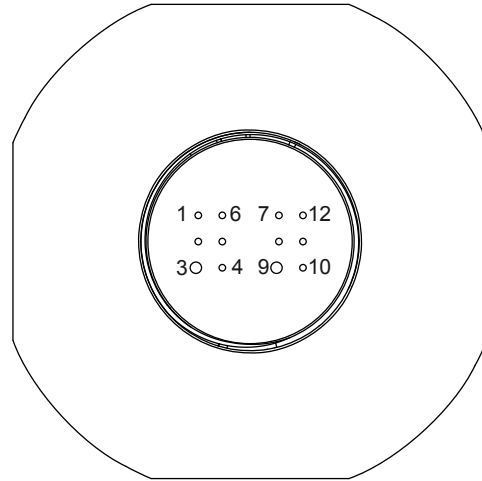
OPTICAL DUAL TRANSMITTER INSERT ARRANGEMENT

TOP
Optical Interface



Front face of the optical dual transmitter
 insert shown, fiber optic cable plug
 opposite

TOP
Electrical Interface



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

OPTICAL PORT ASSIGNMENTS

ARINC 801 OPTICAL INTERFACE

PORT NUMBER	PIN NUMBER	FUNCTION
0	D	RX
1	B	TX

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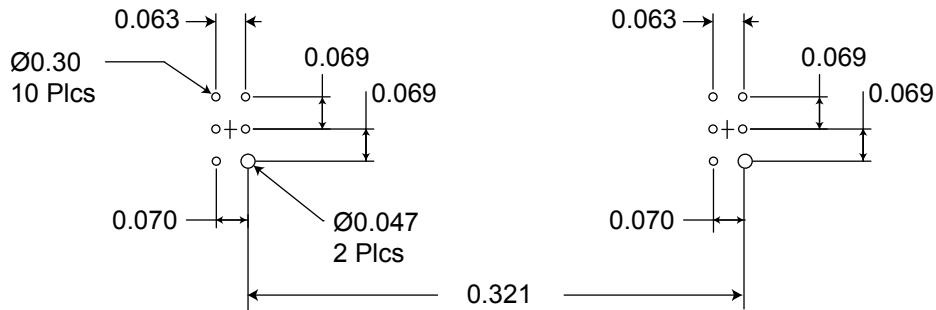
ELECTRICAL PIN ASSIGNMENTS

Pin Number	Symbol	Description	Logic Family
1	GND	Ground	N/A
2	VCC _{RX}	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 - Output	CML
6	RX+	Receiver Data - Output	CML
7	TX_DIS	Transmit Disable - Input Logic 1: Disable Optical Output Logic 0: Enable Optical Output	CMOS Internal 4.7KΩ to 10KΩ pulldown
8	VCC _{TX}	Power Supply - Input	N/A
9	GND	Ground	N/A
10	TX_FAULT	Internal TX Fault Indicator - Output Satisfactory Operation Logic "0" Output Internal Fault: Logic "1" Output	Open Drain CMOS
11	TX-	Transmitter Data - Input	CML
12	TX+	Transmitter Data - Input	CML

PRINTED CIRCUIT BOARD FOOTPRINT

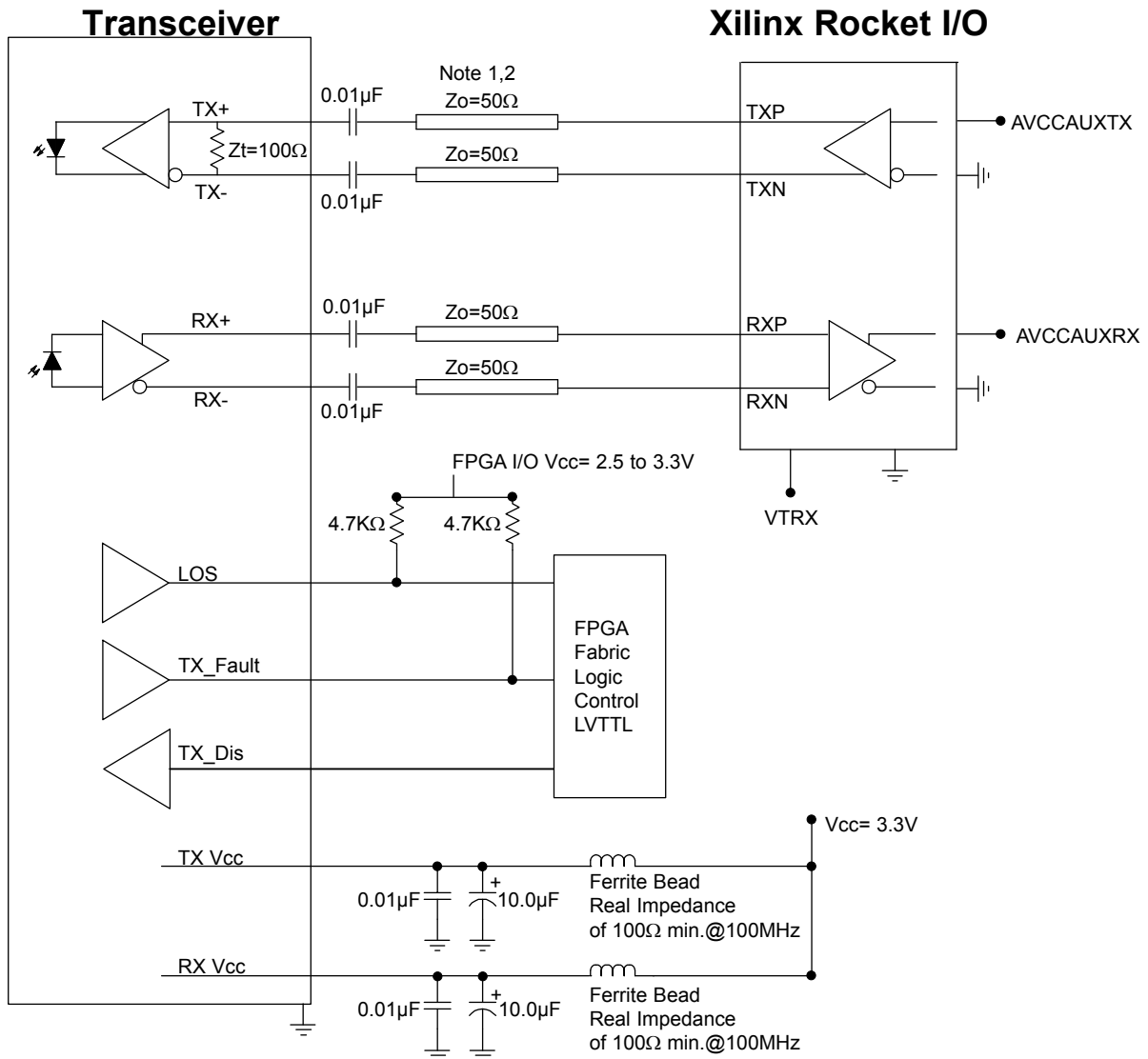
Dimensions are shown as: inches

PCB Hole Pattern
Mounting Side View



APPLICATION SCHEMATIC

For Xilinx Rocket I/O Interfaces



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_Empthesis,
 lengths of 1.0meter are obtainable.

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

APPENDIX A1 PART NUMBER OPTIONS Cutlass13-04 Series

P85 **X** - **2** **X** **1** **X** - **C** **X** **X**

Shell Configuration
P85= D38999 / ARINC 801

Shell Configuration
F= Square Flange
J = Jam Nut

Ports
2= Transceiver

Wavelength
T= 850nm-DualTransmitter
S=850nm-Transceiver

Cable Mode
1= Multimode

Datarate
D = 50Mbps to 2.49Gbps
E = 0.1 to 3.19Gbps
G= 3.2 to 4.25Gbps

Shell Size Code
C = 13-04

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

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



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