

## Razor Series

PCB Mounted Duplex Optical Transmitters, ARINC 818 & sFPDP Applications, Multimode, 850nm

### Duplex Optical Transmitter Unit

#### FEATURES

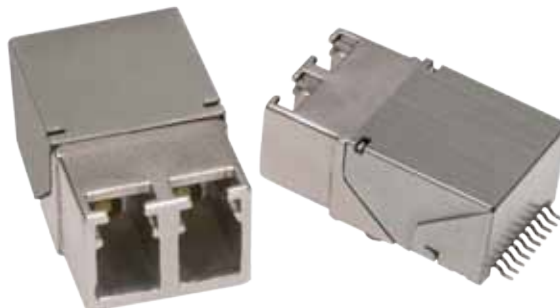
- Compliant with sFPDP and ARINC 818 data links
- Optical fiber link distances up to 550 Meters (50/125µ 500MHz\*Km MMF)
- Maximum optical channel bit error rate less than  $1 \times 10^{-12}$
- Operating temperature range from -40°C to +85°C
- Nickel plated brass shell meets stringent corrosion performance requirements
- Die cast housings are strong, durable and light weight
- Duplex LC compliant optical fiber connector interface
- Threaded PCB retention features provide secure mounting in high shock and vibration environments

#### APPLICATIONS

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

- ARINC 818 video displays
- sFPDP data links
- Camera interfaces

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.



Two TX Channels Operating from 125Mbps to 4.25Gbps

#### DESCRIPTION

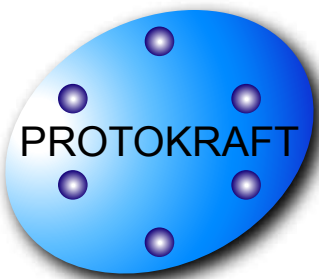
Razor series optical fiber transmitters consist of optoelectronic transmitter functions integrated into a printed circuit board mounted Duplex LC compliant receptacle connector. The optical transmitters are 850nm VCSEL lasers. The transmitter input lines are driven with differential CML signals applied 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 electrical interface to the Razor optical transmitters is a solder pin header with a 10 position SMT / PCB footprint compatible with the industry standard mounting requirements.

#### ORDERING INFORMATION

Application	Part Number
Transmitters @ 0.125 - 5.0Gbps	R25N-2T1G

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## Facilitating Secure Communications in Harsh Environments

Razor Series SMT / PCB mounted Optical Transmitters,  
ARINC 818 or 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	$T_s$	-55		+100	°C
Supply Voltage	$V_{cc}$	-0.5		+4.5	V
TX_DIS Input Voltage	$V_i$	-0.5		$V_{cc} + 0.5$	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
TX Differential Input Voltage (p-p)	$V_D$	0.25		2.2	V

### ENVIRONMENTAL OPERATING CONDITIONS

Requirement	Feature	Condition	Notes
RTCA / D0-160E	ESD	HBM	2200V
RTCA / D0-160E	Damp Heat	10 Cycles	24 Hours
EIA-455-25	Mating Durability	500 Cycles	<0.5dB Change
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

### MATERIALS

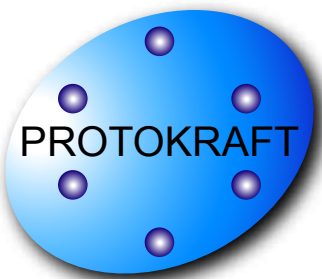
Item	Detail	Notes
Razor Shell	Nickel Plated Brass	
Razor Body	Zamak 5	
Solder Pins	Brass	
Solder Pin Plating	Gold over Nickel	
Alignment Sleeves	Composite Polymer	
Printed Circuits	Polyimide / FR-4	
PCB Conformal Coating	Type AR	MIL-I-46058
Threaded Mounting Posts	Stainless Steel	

Aqueous washing is permitted with the protective covers in place.

If necessary, after washing, clean the optical barrels with lint free swabs and Isopropyl alcohol

The transceivers are conformally coated but after aqueous washing the units should be baked @ 85°C for 1.0 hour to eliminate any retained moisture.

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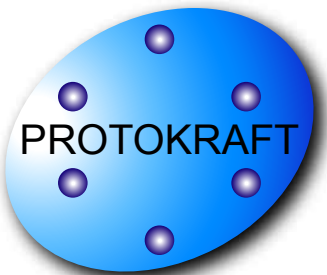
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### OPTICAL TRANSMITTERS $T_A$ = Operating Temperature Range, $V_{CC}$ = 3.135V to 3.465V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power (BER<math>10^{-12}</math>)	$P_o$	-9.5		-1.0	dBm
Optical Output Wavelength	$\lambda_{OUT}$	830	850	860	nM
Spectral Width	$\Delta\lambda_{RMS}$			0.85	nM
Extinction Ratio	ER	9.0			dB
Optical Rise, Fall Time (20% to 80%)	$t_{R,F}$			80	pS

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

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current per Fiber Port	$I_{CCT}$		95	150	mA

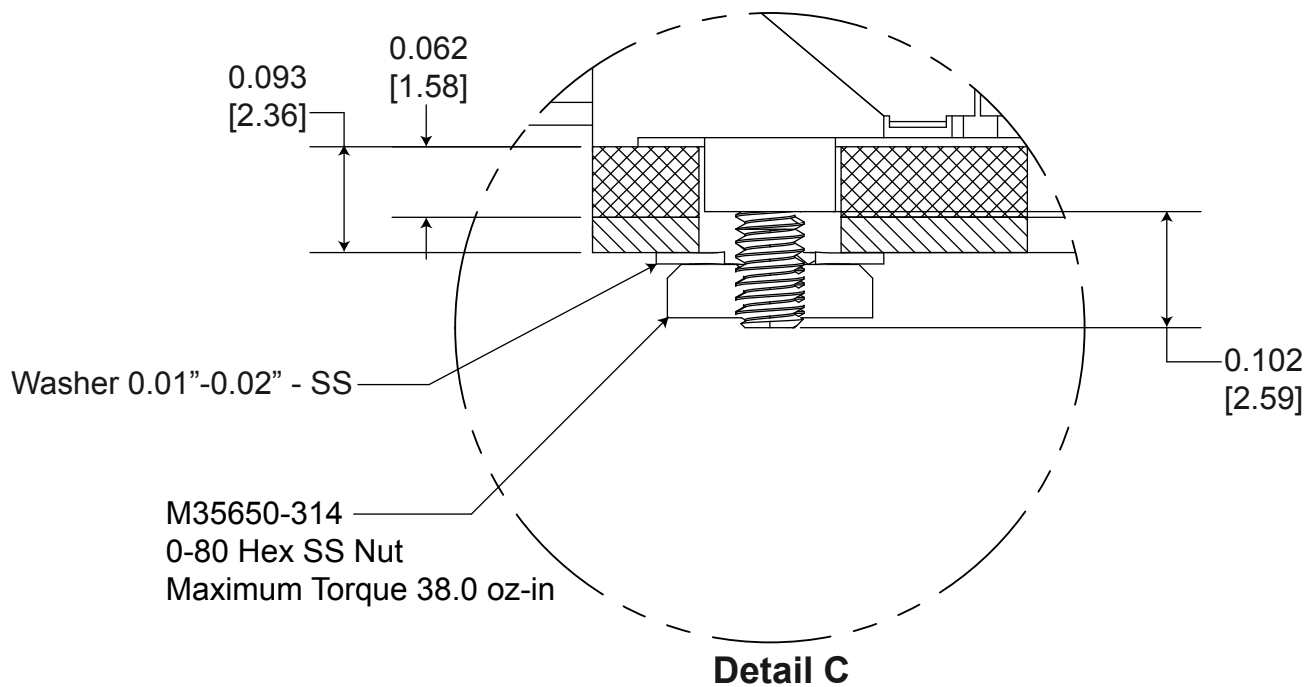
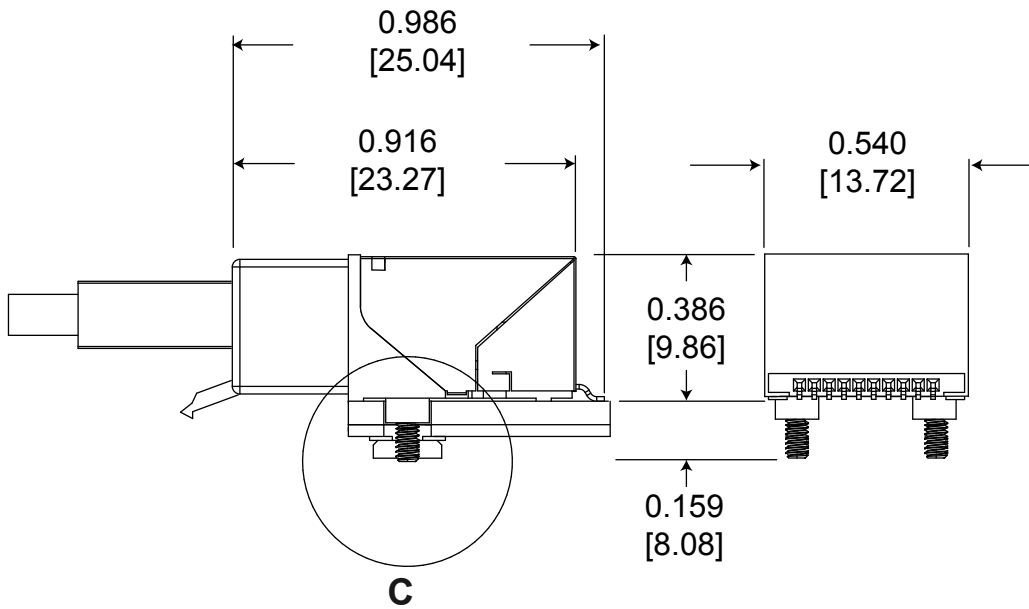


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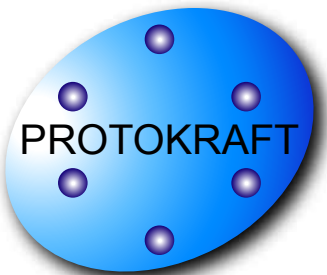
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### OUTLINE DRAWING

Dimensions are shown as: inches [mm]



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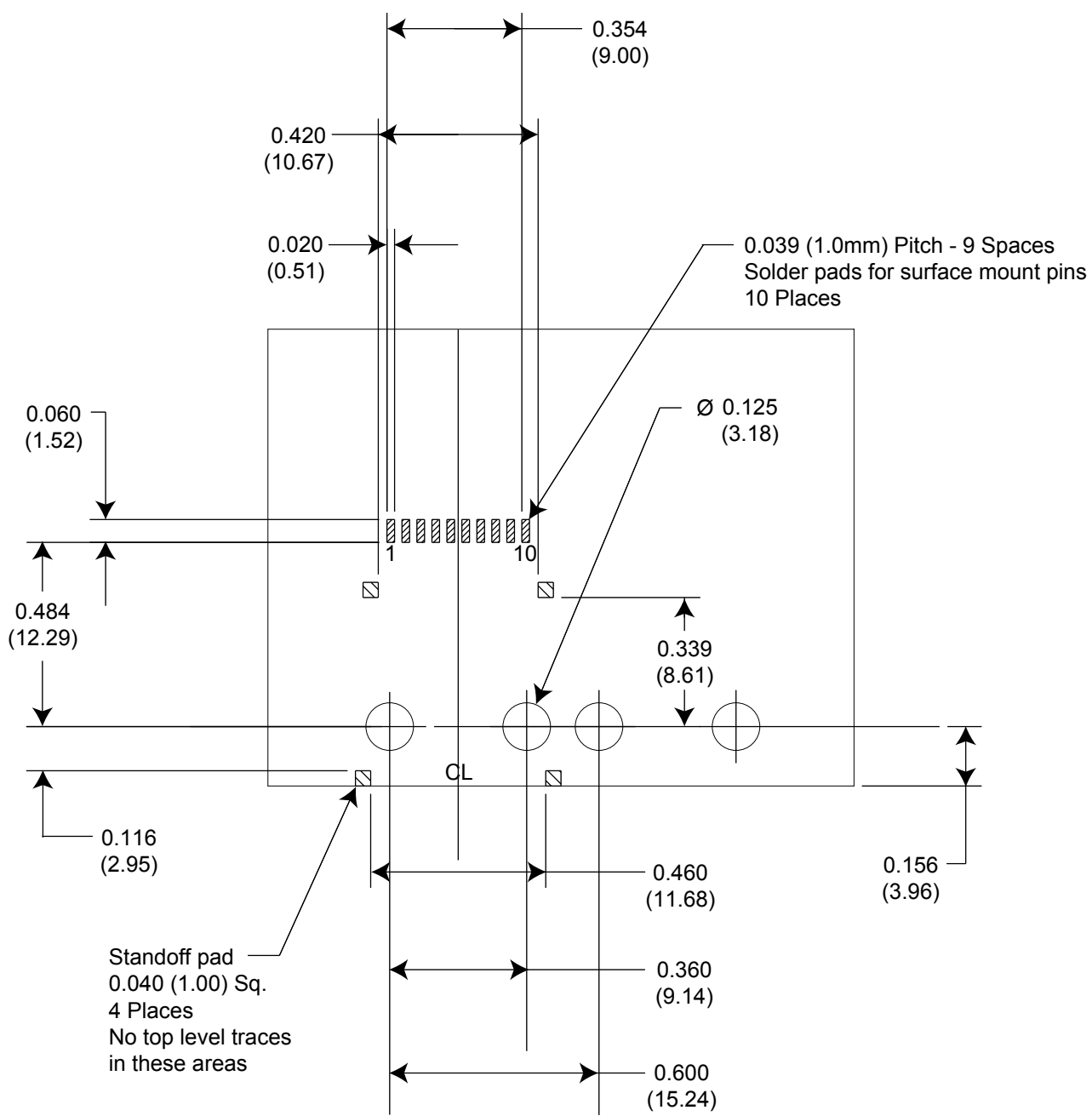


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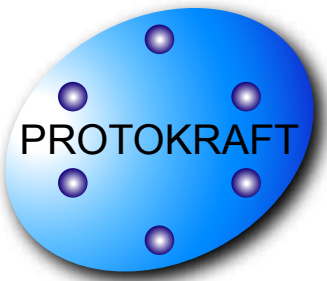
### PRINTED CIRCUIT BOARD FOOTPRINT

Razor Duplex Optical Transceiver  
Dimensions are shown as: inches (mm)



Top View Shown

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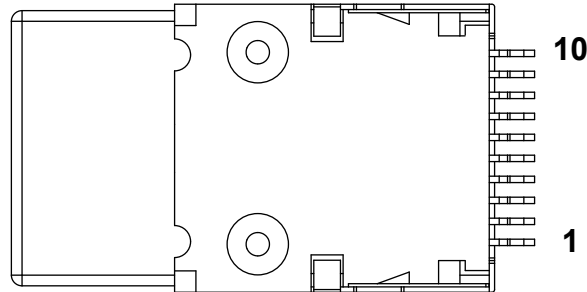


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### ELECTRICAL PIN ASSIGNMENTS

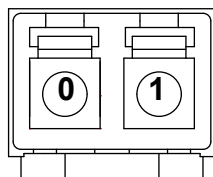
Razor Duplex Optical Transmitter  
Component Bottom View Indicated



Pin Number	Symbol	Port	Description	Logic Family
1	TX+	0	Transmitter Data - Input	CML Internal 100Ω differential termination
2	GND	0	Ground	N/A
3	TX-	0	Transmitter Data - Input	CML Internal 100Ω differential termination
4	V <sub>cc</sub>	0	Power Supply - Input	N/A
5	TX Dis	0	Transmit Disable - Input Logic 1: Disable Optical Output Logic 0: Enable Optical Output	CMOS Internal 4.7KΩ pulldown
6	TX Dis	1	Transmit Disable - Input Logic 1: Disable Optical Output Logic 0: Enable Optical Output	CMOS Internal 4.7KΩ pulldown
7	TX+	1	Transmitter Data - Input	CML Internal 100Ω differential termination
8	V <sub>cc</sub>	1	Power Supply - Input	N/A
9	TX-	1	Transmitter Data - Input	CML Internal 100Ω differential termination
10	GND	1	Ground	N/A

### INSERT ARRANGEMENT

Razor Duplex Optical Transmitter  
Optical interface of the transmitter interface shown  
Mating cable plug interface opposite



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