

## Stiletto Series

PCB Mounted Optical Transceiver,  
10GBase-SR, 10Gigabit Ethernet  
Applications, Multimode, 850nm

### Duplex Optical Transceiver Unit

#### FEATURES

- Compliant with 10Gigabit Ethernet - 10GBase-SR
- Optical fiber link distances up to 300 Meters (50/125 $\mu$  2000MHz\*Km MMF - OM3)
- Maximum optical channel bit error rate less than  $1 \times 10^{-12}$
- Operating temperature range from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- 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

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

- 10 Gigabit Ethernet switches and peripheral
- sFPDP data links
- Video displays

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.



One TX&OneRXChannelOperatingfrom100Mbps to 10.125Gbps

#### DESCRIPTION

Stiletto series optical fiber transceivers consist of optoelectronic transmitter and receiver functions integrated into a pluggable 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.

Outputs from the receivers consist of differential CML data signals on the receiver (RX+ and RX-) lines. An LVTTTL signal is generated on the LOS line upon receipt of an invalid incoming optical signal. 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 electrical interface to the Stiletto optical transceivers is a Samtec SMT Connector with a 20 position footprint.

#### - COMING SOON -

*Stiletto series optical fiber transceivers support the 2-wire serial communication protocol as defined in SFF-8472, offering end user access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage. It also defines alarm and warning flags, to alert end users when particular operating parameters are outside of a factory defined normal range.*

#### ORDERING INFORMATION

Application	Part Number
Transceiver operating from 100Mbps to 10.125Gbps	R45N-2S1K

# Facilitating Secure Communications in Harsh Environments

Stiletto Series SMT / PCB mounted Optical Transceiver,  
10 GbE, 10GBase-SR / SFI 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
Metal Shell	Nickel Plated Brass	
Die Cast Body	Zamak 5	
Connector Pins	Brass	
Connector Pin Plating	Gold over Nickel	
Alignment Sleeves	Composite Polymer	
Printed Circuits	Polyimide / FR-4	
PCB Conformal Coating	Type AR	
Threaded Mounting Posts	Stainless Steel	

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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> )	$P_o$	-5.0		-1.0	dBm
Optical Output Wavelength	$\lambda_{OUT}$	840	850	860	nM
Spectral Width	$\Delta\lambda_{RMS}$			0.45	nM
Extinction Ratio	ER	3.0	5.5		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)	$P_I$	-11.1		0.0	dBm
Optical Wavelength	$\lambda_{IN}$	840	850	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 per Port	$I_{CCT}$		300	400	mA

## OPTICAL LINK DISTANCES

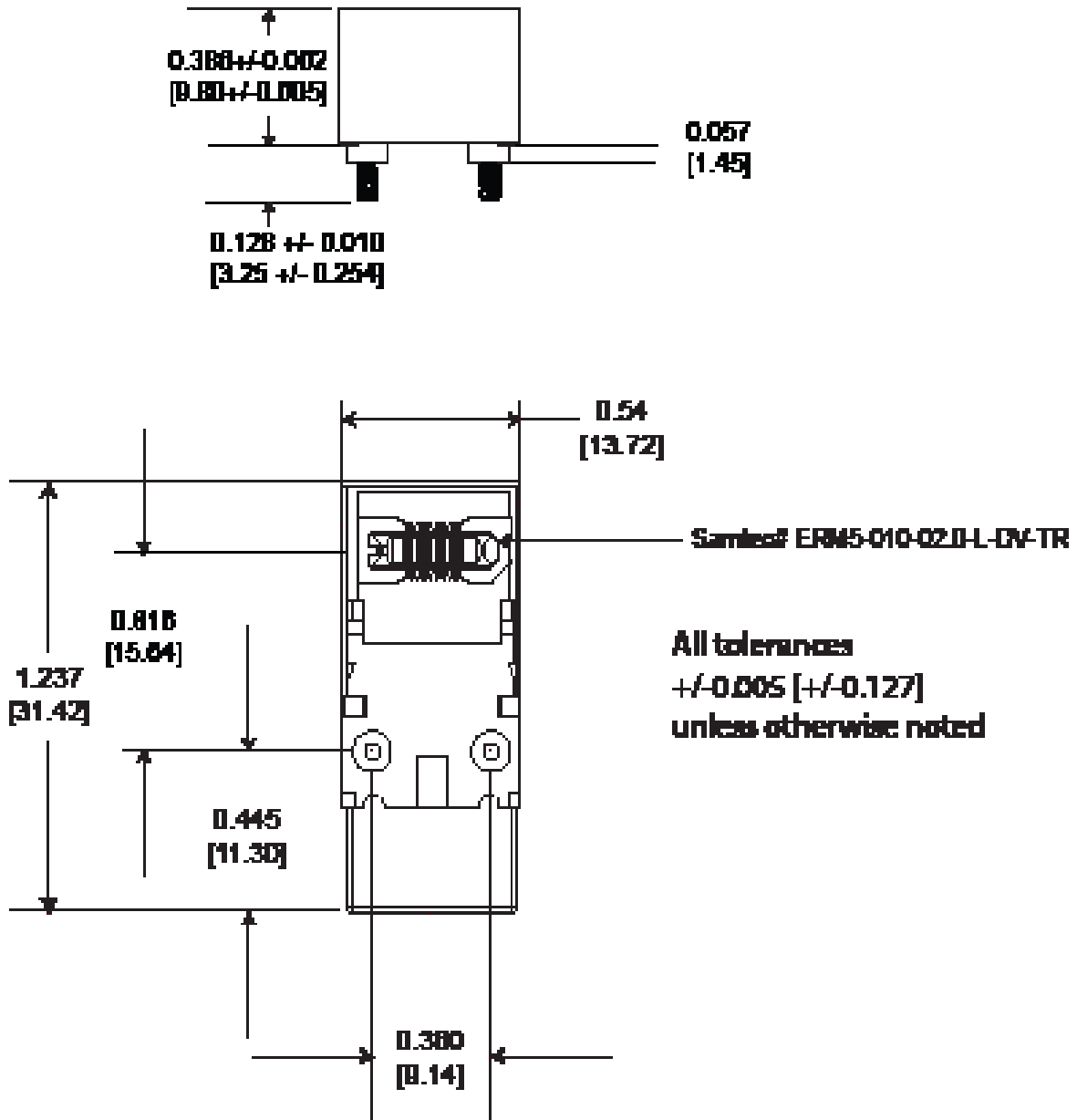
Cable Type	62.5/125 $\mu$ 160MHz*Km	62.5/125 $\mu$ 200MHz*Km	50/125 $\mu$ 400MHz*Km	50/125 $\mu$ 500MHz*Km	50/125 $\mu$ 2000MHz*Km
Maximum Supported Link Distance - Meters	26	33	66	82	300

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## OUTLINE DRAWING

Dimensions are shown as: inches



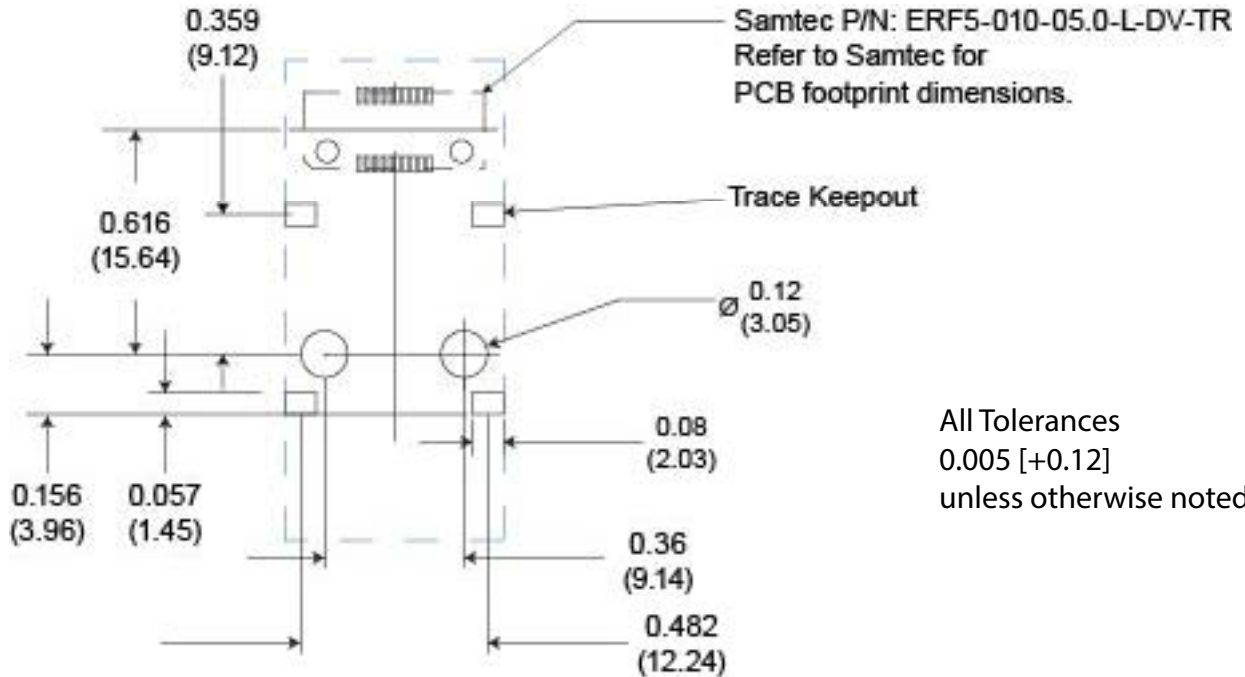
All measurements  
are in inches and  
[millimeters].

# Facilitating Secure Communications in Harsh Environments

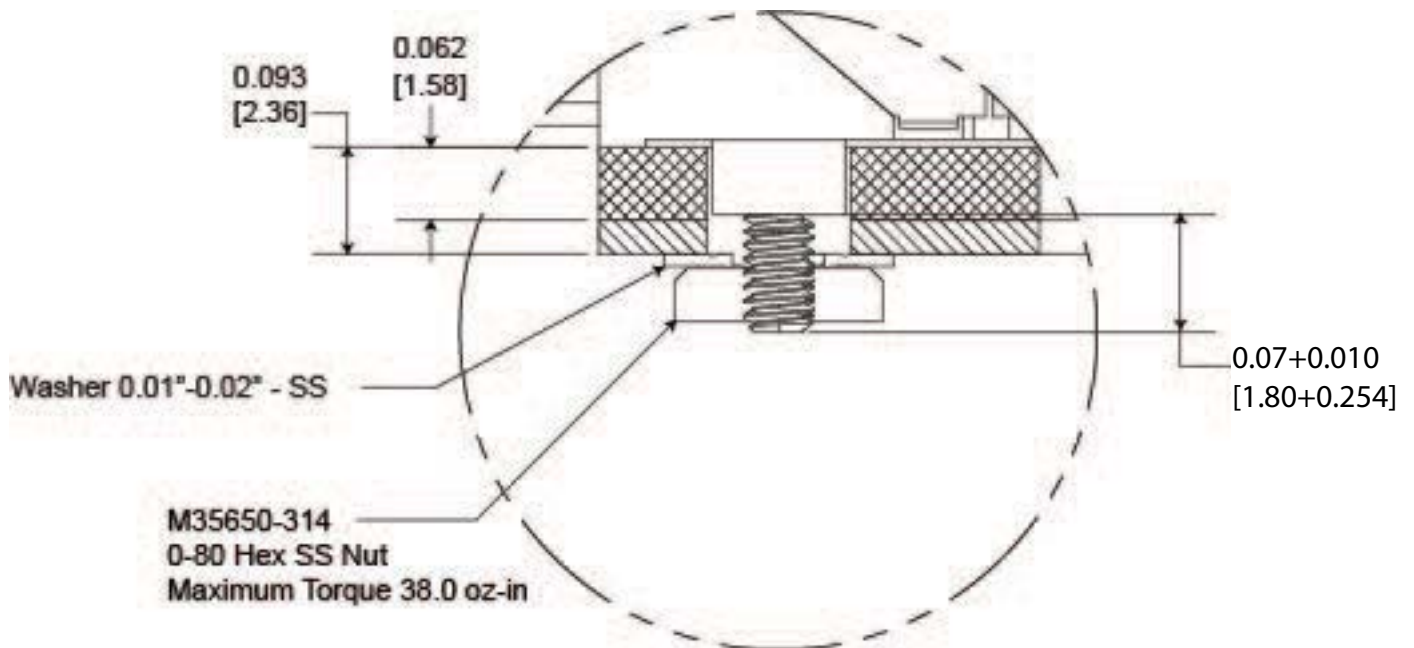
Stiletto Series SMT / PCB mounted Optical Transceiver,  
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## PRINTED CIRCUIT BOARD FOOTPRINT

Dimensions are shown as: inches (mm)



All Tolerances  
0.005 [+0.12]  
unless otherwise noted

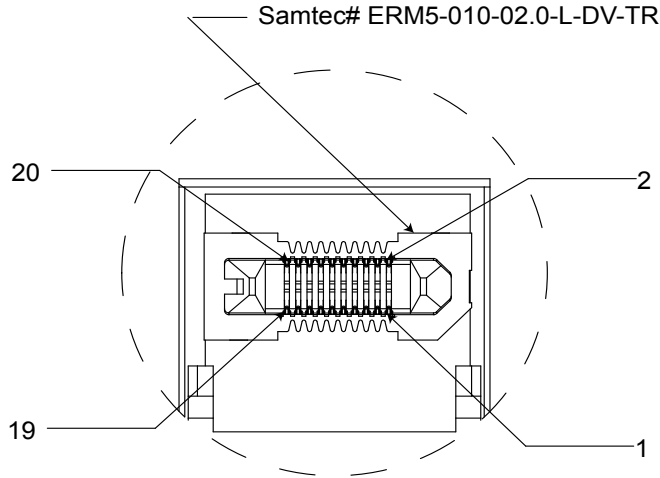


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## ELECTRICAL PIN ASSIGNMENTS

Component Bottom View Indicated



Pin Number	Symbol	Description	Logic Family
1	TX-	Transmitter DATA In -	CML
2	TX_Fault	Internal TX Fault Indicator - Output Satisfactory Operation: Logic "0" Output Internal Fault: Logic: "1" Output	Open Drain CMOS
3	TX+	Transmitter DATA In +	CML
4	SDA	2 Wire Serial Interface Data	I <sup>2</sup> C
5	SCL	2-wire Serial Interface Clock Line	I <sup>2</sup> C
6	GND	Ground - Isolated from Case	N/A
7	RSO	No Connection Required	N/A
8	RX_LOS	Loss of Signal - Output Satisfactory Optical Input: Logic "0" Output Unsatisfactory Optical Input: Logic "1" Output	Open Drain CMOS
9	RSEL	No Connection Required	N/A
10	GND	Ground - Isolated from Case	N/A
11	GND	Ground - Isolated from Case	N/A
12	TX_Dis	TX Disable - Input Logic 1: Disable Optical Output Logic 0: Enable Optical Output	LVTTL
13	GND	Ground - Isolated from Case	N/A
14	GND	Ground - Isolated from Case	N/A
15	VCC	Power Supply	N/A
16	VCC	Power Supply	N/A
17	RX-	Receiver DATA out -	CML
18	GND	Ground - Isolated from Case	N/A
19	RX+	Receiver DATA out +	CML
20	GND	Ground - Isolated from Case	N/A

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## OPTICAL TRANSCEIVER

## SERDES

