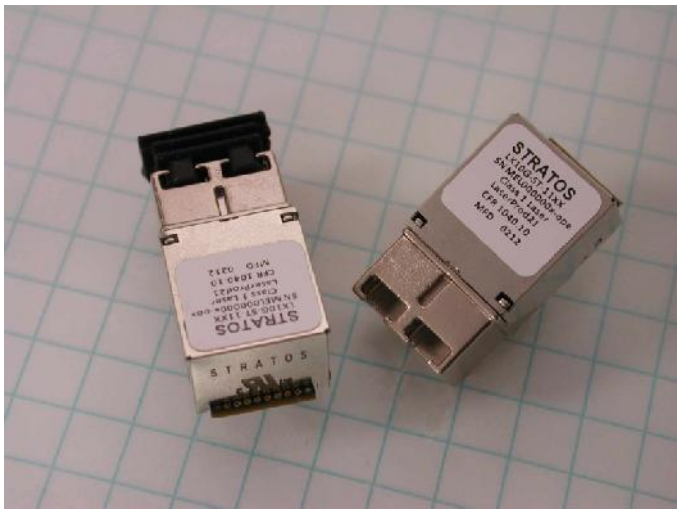
Stratos
Lx10G-ST11xx Low Profile Optical Transceiver

Connectivity for Business Critical Continuity™

10G Ethernet (10.3125Gbps), 3.3V, 850nm VCSEL, Multimode, Up to 50 Meters

Key Features & Benefits

- Low Profile Design - 0.386 inches max. height
- Surface mount I/O pins for high speed signal integrity
- All metal body, solder or screw mount options
- Industrial Temp Range, Vibration tolerant design
- RX data squelch on Signal Detect deassert
- Individual (separate) +3.3 V power supply per port
- Industry standard duplex multimode LC receptacle
- EN-60825 / IEC-825 / CDRH Class 1 Compliant
- Optional Conformal Coating
- Optional addition of fiber pigtail



Ordering Information

Low Rider	**L**	**X**	**10G**	**-**	**ST11**	**X**	**X**
Roughrider[1]	**RR**		**10G**	**-**	**ST11**	**X**	**X**

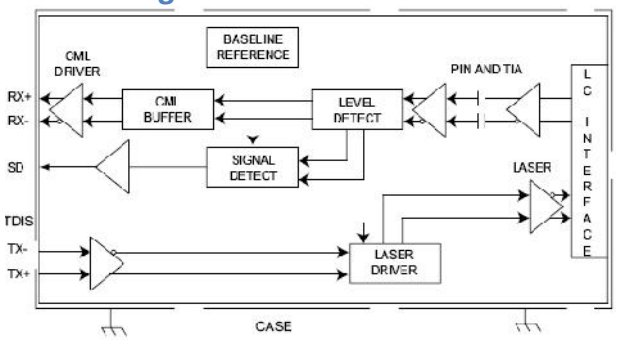
Shell Options
N= No GND Tabs (Flat Shell)
T= GND Tabs

Temperature and coating
H= -40 to 85 C, No Coating
M= -40 to 85 C, Conformal Coating

Mounting
BLANK= Solder Posts (0.125 length)
B= Screw Posts (0.050 length)

1. Consult the Roughrider worksheet on pg. 12 for pigtail options.

Block Diagram



Applications

The Lx10G-ST11xx multimode optical fiber transceivers provide low profile, cost effective solutions for rate agile 10G Ethernet multimode optical fiber data links, with a duplex LC connector interface. These transceivers are intended to work with 10G Ethernet applications but can be used for any other data communications purpose within their operating parameters.

Product Overview

The **Emerson Network Power Connectivity Solutions** Lx10G-ST11xx fiber optic transceivers consist of transmitter and receiver functions combined in a Low Profile RJ Format module. The optical transmitter is a high output 850nm VCSEL. The transmitter input lines are driven with differential LVPECL signals applied to the Transmit (TX+ and TX-) pins. These signals are internally converted to a suitable modulation current by a CMOS integrated circuit. A Transmit Disable (TDIS) function is provided to enable control of the VCSEL optical output. The optical receivers consist of PIN and Preamplifier assemblies and CMOS limiting post-amplifier integrated circuits. Outputs from the receivers consist of differential CML data signals on the Receive (RX+ and RX-) pins and a single ended LVTTL signal detect function on the Signal Detect (SD) pin. The RX data is squelched (JAM) upon Signal Detect deassert to prevent garbage data output when no optical signal is present.

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【URL】 http://www.nasco.co.jp

Stratos Connectivity Solutions

EMERSON Network Power

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.

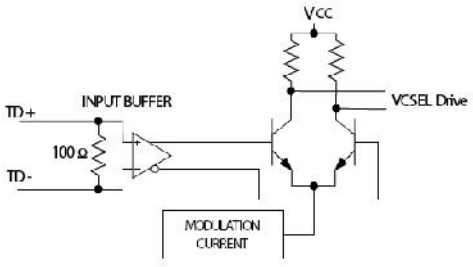
Parameter	Symbol	MIN	Typical	MAX	Unit
Storage Temperature	T_S	-55		+100	°C
Lead Soldering Temperature	T_{SOLD}			+260	°C
Lead Soldering Time[1]	t_{SOLD}			10	Seconds
Supply Voltage	V_{CC}	-0.5		+4.5	V
Data Input Voltage	V_I	-0.5		V_{CC}	V
Differential Input Voltage (p-p)	V_D			1.5	V
Output Current	I_O			50	mA

1. Recommended for hand solder or hot bar soldering only. Convection or IR reflow oven profiles may damage internal solder joints. Reference Low Rider Soldering Application Note.

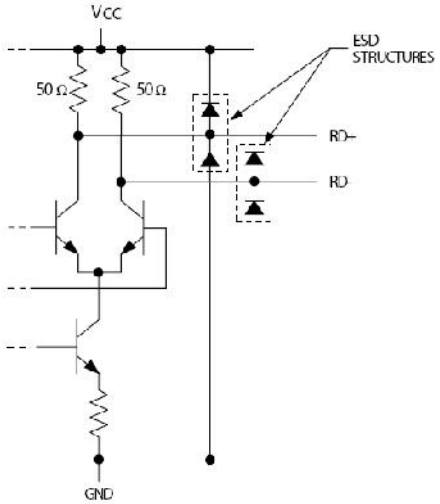
Recommended Operating Conditions

Parameter	Symbol	MIN	Typical	MAX	Unit
Operating Temperature Limit	T_A	-40		+85	°C
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	0.200	0.500	1.000	V
Transmit Disable Voltage	V_{TD}	2.4		V_{CC}	V
Transmit Enable Voltage	V_{TEN}	V_{EE}		0.8	V
RX Data Output Load	R_L		50		Ω

Detail of Data I/O Stages



TD+/- LVPECL Input Stage



RD+/- CML Output Stage

Transmitters: VCCTX = 3.135V to 3.465V, T_A = Operating Temperature Range

Parameter	Symbol	MIN	Typical	MAX	Unit
Optical Output Power[1]	P_O	-7.0	-4.0	-1.3	dBm
Optical Output Wavelength	λ_{OUT}	840	850	860	Nm
Spectral Width	$\Delta\lambda_{RMS}$			0.85	Nm
Extinction Ratio	ER	3	5		dB
Supply Current	I_{CC}		120	200	mA
Total Jitter[1]	Tj			60	ps

1. BER=10^{-12} @ 10.3125Gbps, PRBS 2^7-1, NRZ

Receivers: VCCRX = 3.135V to 3.465V, T_A = Operating Temperature Range

Parameter	Symbol	MIN	Typical	MAX	Unit
Optical Sensitivity[1] 10.3125 Gbps	P_I	-11.0		0	dBm
Optical Wavelength	λ_{IN}	840		860	Nm
Signal Detect Assert Time	t_{SDAS}		<10	100	µS
Signal Detect Deassert Time	t_{SDDA}		<10	350	µS
Signal Detect Deassert Level[4]	SD_{OFF}	-21			dBm
Signal Detect Assert Level	SD_{ON}			-11	dBm
Signal Detect Hysteresis	HYS	1.0	2.25	3.5	dB
RX Data Output – Low	V_{OL}- V_{CC}	-1.810		-1.475	V
RX Data Output – High	V_{OH}- V_{CC}	-1.165		-0.880	V
Supply Current	I_{CC}		120	150	mA

1. Assuming an Extinction Ratio of 4 dB
2. BER=10^{-12}@ 10.3125Gbps, PRBS = 2^7-1, NRZ
4. RX Data outputs are squelched when Signal Detect is deasserted to prevent garbage data output when no optical signal is present

Link Distances

Application	Fiber Specification	Distance
10G Ethernet – IEEE 802.3z	62.5/125 – 160MHz*Km	26M
	50/125 – 400MHz*Km	66M
	50/125 – 2000MHz*Km (OM3)	300M
	50/125 – 4700MHz*Km (OM4)	550M

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For product information:
www.stratosoptical.com
call (708) 457-2582 or 1-800-323-6858

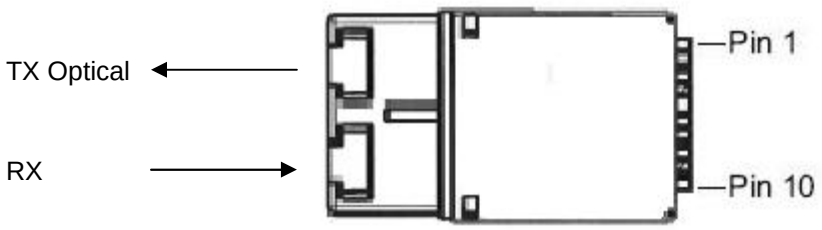
Conformal Coating Option

Parameter	Value
Coating	Conathane CE-1155

Regulatory Compliance

Requirement	Feature	Condition	Notes
MIL-STD-883-3015.7	ESD	Class II	2200V
IEC-801-2	ESD	Human Body Model	25KV
IEC-801-3	EMI	Immunity	10V/M
FCC	EMI	Class B	>20dB
EN 55022 (CISPR 22A)	EMI	Class B	10V/M
IEC-825 Issue 1993-11	Eye Safety	Class 1	TUV Certificate Number on File
FDA CDRH 21-CFR 1040	Eye Safety	Class 1	CDRH Accession Number on File

Low Profile Optical Transceiver
Top View Shown



Pin Functions

Pin Number	Symbol	Description	Logic Family
GP	GP	Grounding Posts Connect to chassis ground	N/A
1	TD+	Transmitter DATA In	LVPECL
2	VEETX	Transmitter Signal Ground	N/A
3	TD-	Transmitter DATA In	LVPECL
4	VCCTX	Transmitter Power Supply	N/A
5	SD	Signal Detect Output Satisfactory Optical Input: Logic “1” Output Fault Condition: Logic “0” Output	LVTTL
6	TDIS	Transmit Disable Input Logic 1 = Disable Optical Output Logic 0 = Enable Optical Output	LVTTL
7	RD+	Receiver DATA Out	CML
8	VCCRX	Receiver Power Supply	N/A
9	RD-	Receiver DATA Out	CML
10	VEERX	Receiver Signal Ground	N/A

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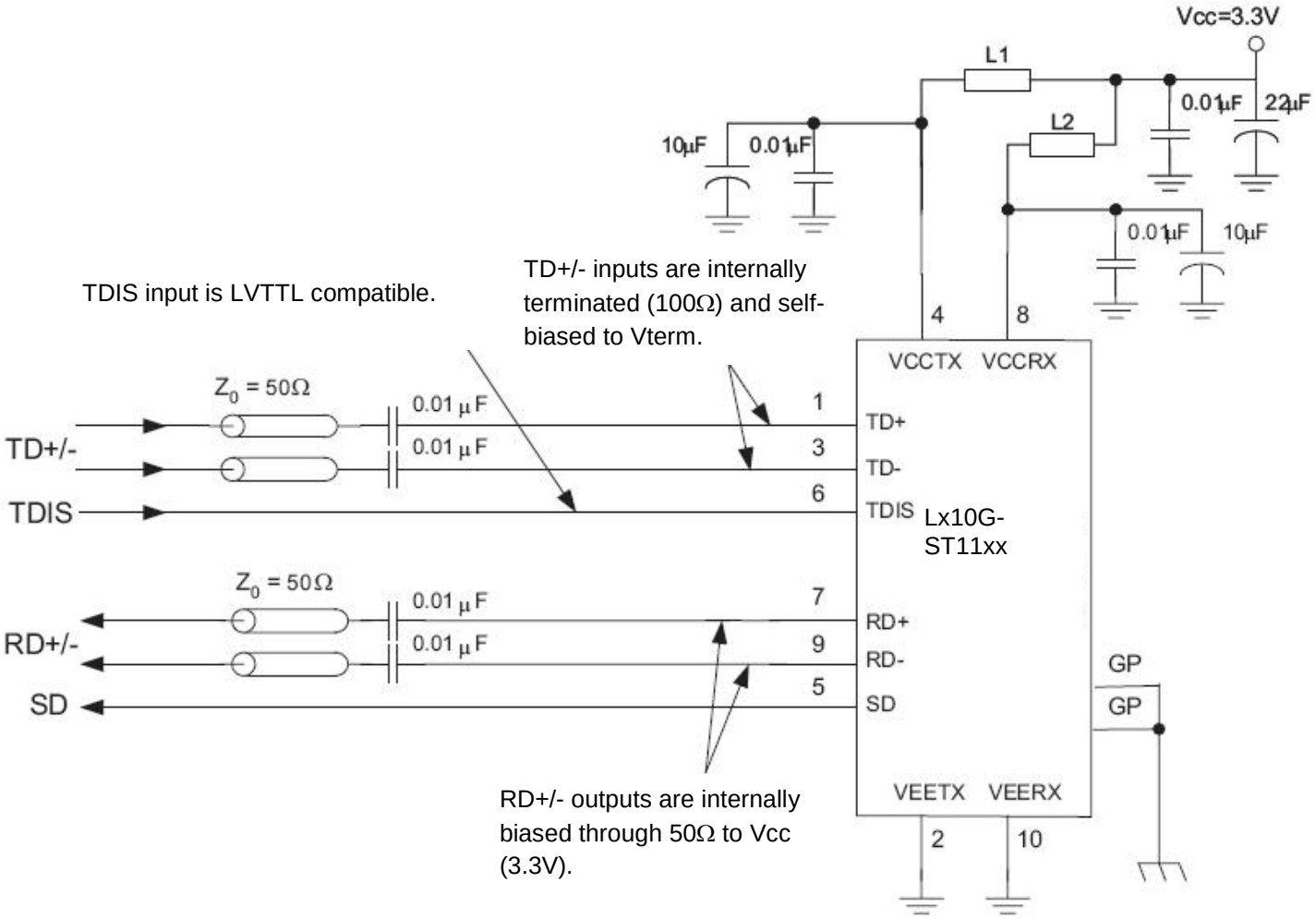
Application Schematic



Notes:

1) L1 and L2 = MuRata BLM21A601S or equivalent (600Ω at 100MHz or better).

2) Route the differential pairs (TD +/- and RD +/-) together using 50Ω impedance matched traces.

3) Use separate power supply filtering for VCCTX and VCCRX, as shown.

4) Use low ESR capacitors such as NPO or COG for AC Coupling of the TD+/- and RD+/- data signals.

5) Ground Posts (GP) are isolated from Signal Ground (Vee), and may be connected to Chassis Ground (as shown) or to Signal Ground if a Chassis Ground is not available.

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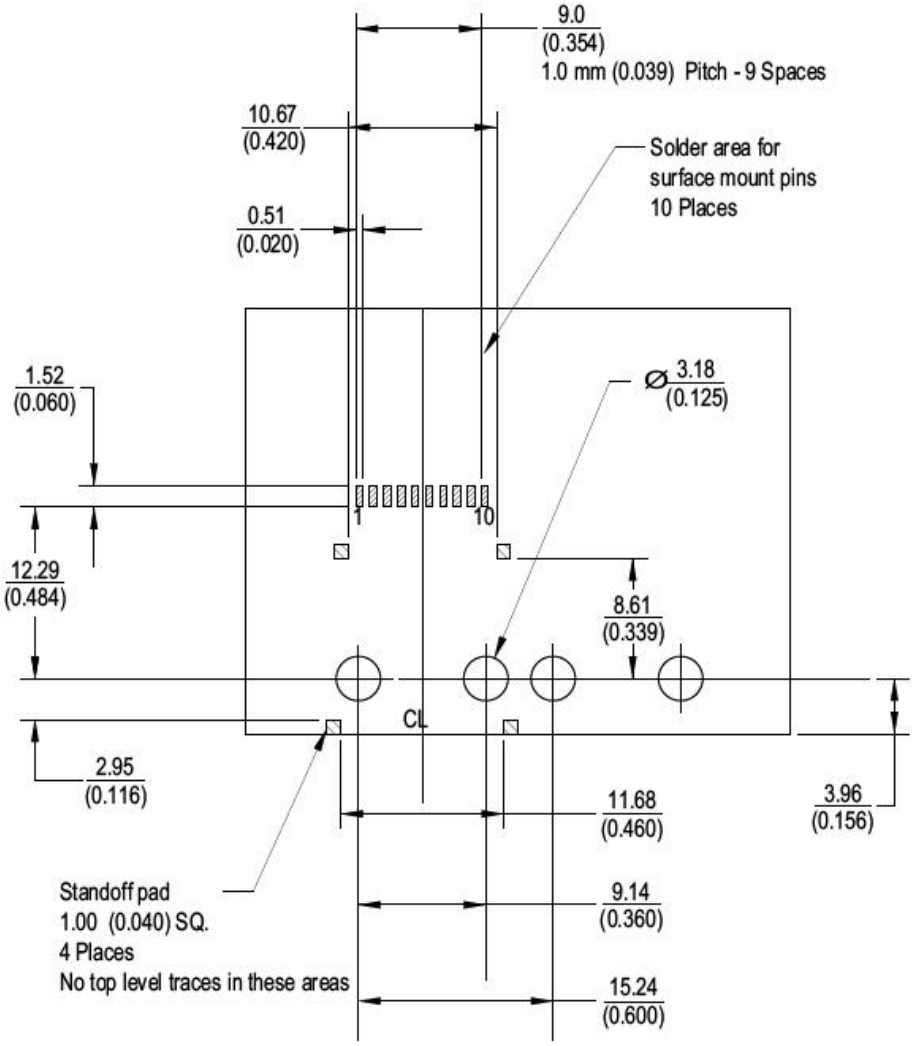
Low Profile Optical Transceiver PCB Footprint

Dimensions are shown as:

mm
(inches)

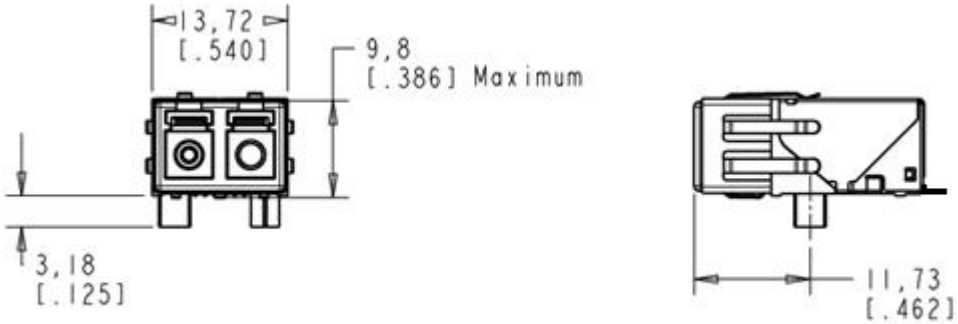


Top View Shown

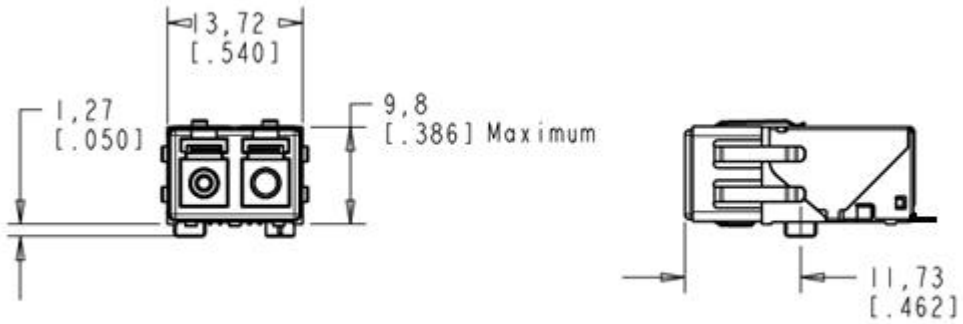
Low Rider Mechanical Detail

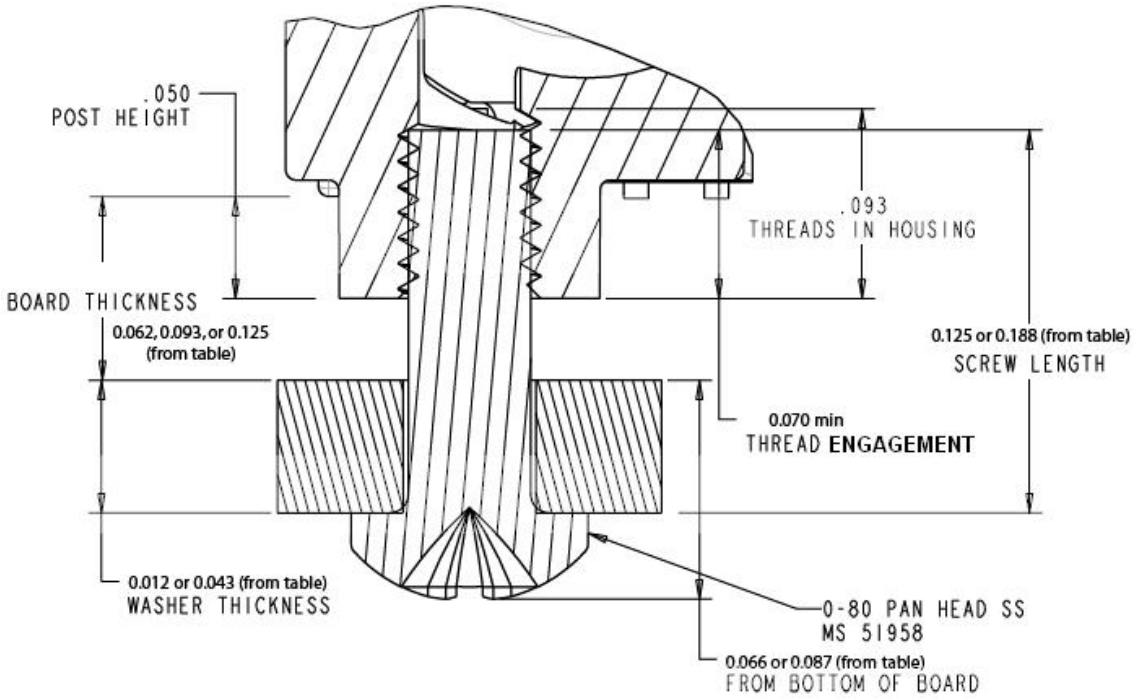
(Recommended panel cut-out for proper ground clip contact is 0.400 x 0.560 inches.)

Solder Post Version



Screw Post Version





PCB Nominal Thickness	Screw Length	Washer Thickness	Screw/Washer Height	Order Stratos Washer	Order Stratos Screw
0.062 inches +/- 0.005	0.125 inches	0.043 inches	0.087 inches	751-00002	618-00001
0.093 inches +/- 0.005	0.125 inches	0.012 inches	0.066 inches	751-00001	618-00001
0.125 inches +/- 0.005	0.188 inches	0.043 inches	0.087 inches	751-00002	618-00002

Notes:

1) Customer may choose a 0-80 UNF 2A Stainless Steel (SS) screw configuration (pan head, flat head, hex head, etc) as long as the thread engagement is less than 0.93 inches max into the Low Rider housing.

2) Customer can order 0-80 SS pan head screws and washers from Stratos for standard sized PCB thicknesses as identified in the table. The Stratos part number is identified for the screw/washer combination for each of three standard sized PCB thicknesses. Be sure to order 2 washers and 2 screws per Low Rider device.

3) Torque screws to 7 to 9 in-oz for a clamping force of 36 to 47 lbs per screw. Do not exceed 16 in-oz torque per screw.

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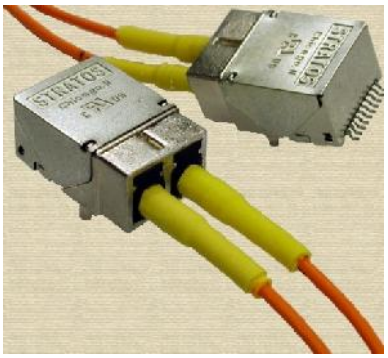
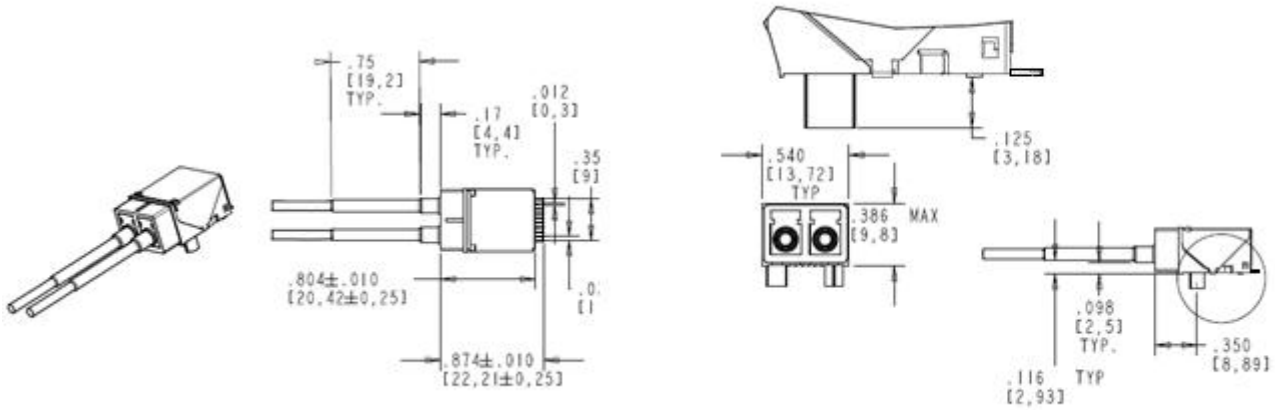
Pigtail Options

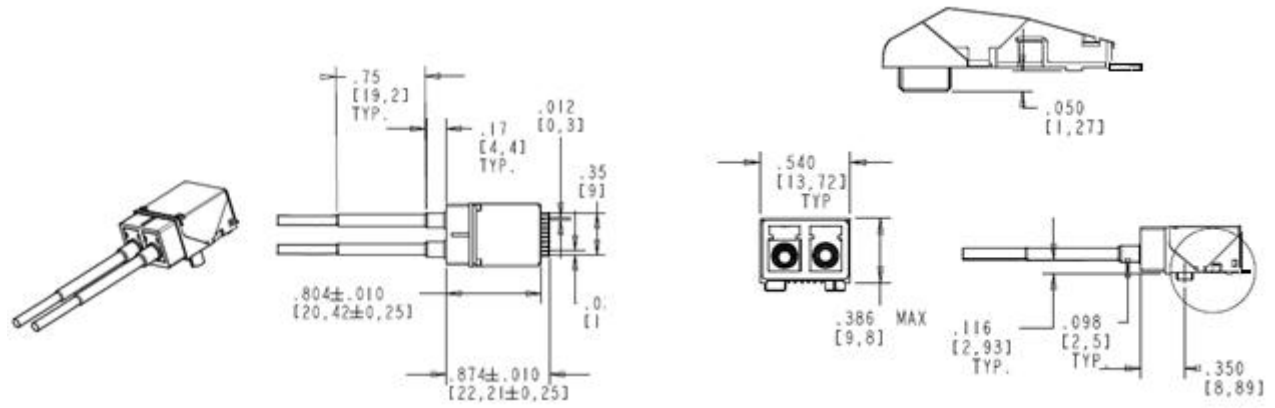
The Low Profile RJ optical transceiver can be ordered with permanently attached fiber pigtails. The fiber pigtails are customized to the customer's application and can vary in length from as short as 3 inches to as long as 50 inches, possibly longer dependent upon the application. The fiber pigtail optical connector may be selected from a wide variety of industry supported optical termini. Almost any combination is possible, as long as the termini components are available and supported by the OEM. Common termini components selected by customers include industry standard LC, SC, FC, ST, M29504, PHD, and others. Reference the Roughrider Worksheet portion of this datasheet as a guide to capture your custom requirements.



Roughrider Mechanical Detail (Solder Post Version)



Roughrider Mechanical Detail (Screw Post Version)



All dimensions are +/- .005 unless otherwise noted. All dimensions are inch/mm.

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Part Number Summary and Options

Low Rider Part Number	Roughrider Part Number[1]	Flat Shell	Clip Shell	Conf Coat	Solder Posts	Screw Posts
LN10G-ST11H	RR10G-ST11H-Sxxx	X			X	
LN10G-ST11M	RR10G-ST11M-Sxxx	X		X	X	
LN10G-ST11HB	RR10G-ST11HB-Sxxx	X				X
LN10G-ST11MB	RR10G-ST11MB-Sxxx	X		X		X
LT10G-ST11H			X		X	
LT10G-ST11M			X	X	X	
LT10G-ST11HB			X			X
LT10G-ST11MB			X	X		X

1. For Roughrider options, consult the factory to determine your custom part number (-Sxxx suffix) dependent upon fiber type, termination type, and other Roughrider worksheet options. Worksheet located in product detail sheet.

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Emerson Connectivity Solutions – Stratos Products
Roughrider Worksheet

(Please use this worksheet to specify your order for Roughrider parts)

Customer, Program: _____

Low Rider or MIL SFF Part Number: (if known) _____

Data Rate: _____

Wavelength: 850

Mode: Multimode

Conformal Coat: Yes No

Post: Screw Post Solder Post

Fiber Type:

62.5/125 µm Multimode: OCC AE001CWST5KM or equivalent

50/125 µm Multimode: OCC AE001CAST5KM or equivalent

Other: _____

RX Termini: _____

TX Termini: _____

RX Pigtail Length: (+/- 0.5 inches is default)
(Not including transceiver body, to tip of termini) _____

TX Pigtail Length: (+/- 0.5 inches is default)
(Not including transceiver body, to tip of termini) _____

Special Notes: (Boot color, heatshrink, labels, special testing, shipping, etc.) _____

Part Number: (Assigned by Emerson Connectivity Solutions)	**Assigned By:** (Emerson)	**Date:**

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