



LxL5-S-T2x LOW PROFILE HIGH POWER DUAL CHANNEL OPTICAL TRANSMITTER

1x/2x Fibre Channel Applications
3.3V, 850nm VCSEL, Multimode,
Extended Link Budget

PRELIMINARY

FEATURES

- Dual transmitter, lower cost than 2 independent units
- 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
- Individual (separate) +3.3 V power supply per port
- Industry standard duplex multimode LC receptacle
- Compliant with ANSI Fiber Channel FC-PI / PH2
- EN-60825/ IEC-825 / CDRH Class 1 Compliant
- Optional Parylene C Conformal Coating
- Extended Link Margin via Higher TX Optical Power

APPLICATIONS

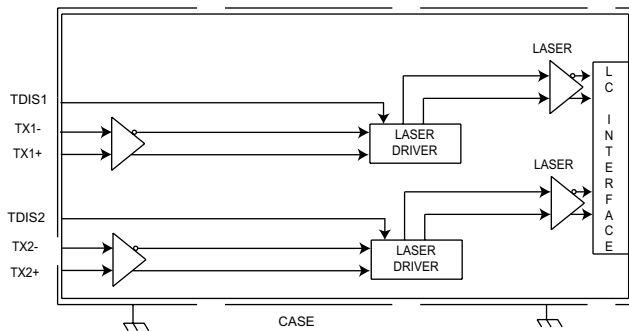
The LxL5-S-T2xx multimode optical dual transmitters provide low profile, cost effective solutions for 1x/2x Fiber Channel multimode optical fiber data links with a duplex LC connector interface.

These transmitters are fully compliant with the Fiber Channel standards but can be used for any other data communications purpose within their operating parameters.

DESCRIPTION

The LxL5-S-T2xx fiber optic transmitters consist of two transmitter functions combined in an Low Profile RJ Format module. The optical transmitter is a high output 850nm VCSEL tuned to add 5dB link Budget over standard Fiber Channel specifications. 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.

BLOCK DIAGRAM



ORDERING INFORMATION

L X L5 - S-T2 X X

Product Family	Shell Options	Application	Optical Wavelength, Signal Detect, Fiber	Temperature and Coating	Mounting
L= Low Profile RJ XCVR	N= No GND Tabs (Flat Shell)	L5= 1x/2x FC (1.0625 - 2.125Gbps),	S-T2= Dual TX Channels, 850 nm Multimode, 3.3VDC Power	H= -40 to 85 C, No Coating	BLANK= Solder Posts (0.125 length)
	T= GND Tabs	+5dB Link Budget over Std Device		M= -40 to 85 C, Conformal Coating	B= Screw Posts (0.050 length)

L _ L5 - S-T2 _ _

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ABSOLUTE MAXIMUM RATINGS

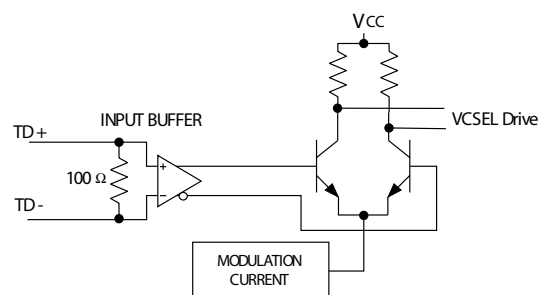
Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values 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
Lead Soldering Temperature	T_{SOLD}			+260	°C
Lead Soldering Time	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			2.2	V
Output Current	I_O			50	mA

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	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	0.20		2.20	V
Transmit Disable Voltage	V_{TD}	2.0		V_{CC}	V
Transmit Enable Voltage	V_{TEN}	V_{EE}		0.8	V

DETAIL OF DATA I/O STAGES



TD+/- LVPECL Input Stage



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TRANSMITTERS T_A = Operating Temperature Range, VCCTX = 3.135V to 3.465V

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power ^{1,2}	P_o	-5.0	-4.0	-1.5	dBm
Optical Output Wavelength	λ_{OUT}	830	850	860	nm
Spectral Width	$\Delta\lambda_{RMS}$			0.85	nm
Extinction Ratio	ER	6	9		dB
Supply Current ³	I_{CC}		90	140	mA
Optical Rise / Fall Time (20% - 80%) 2.125 GigaBaud	$t_{R,F}$			150	ps
1.0625 GigaBaud				300	ps
RIN				-117	dB/Hz
Optical Modulation Amplitude (p-p)	OMA	378	618		μ W
Total Jitter ¹	TJ			207	ps
Deterministic Jitter ¹	DJ			122	ps

Notes

1. BER= 10^{-12} @ 2.125 GigaBaud, PRBS = 2^7-1 , NRZ, Compliant with FC-P1-2.
2. BER= 10^{-12} @ 1.0625 GigaBaud, PRBS = 2^7-1 , NRZ, Compliant with FC-PH
3. Supply current is total current for both transmitters active. Divide by 2 for only one transmitter active. .

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CONFORMAL COATING OPTION

Parameter	Value
Specification	MIL-I-46058C, Type XY
Coating:	Parylene type C
Deposition:	Vacuum deposited
Film Thickness:	1 MIL +/- 0.0002

LINK DISTANCES

Fiber Specification	Application	Distance
62.5/125 (200MHz*Km)	2x Fibre Channel - ANSI X3.297 FC-PI	150M
	1x Fibre Channel - ANSI X3.297 FC-PH-2	300M
50/125 (500MHz*Km)	2x Fibre Channel - ANSI X3.297 FC-PI	300M
	1x Fibre Channel - ANSI X3.297 FC-PH-2	500M

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 One File
FDA CDRH 21-CFR 1040	Eye Safety	Class 1	CDRH Accession Number On File

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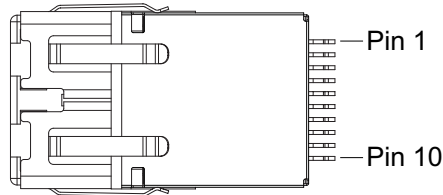
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Low Profile Optical Transceiver
Top View Shown



PIN FUNCTIONS

Pin Number	Symbol	Description	Logic Family
GP	GP	Grounding Posts Connect to chassis ground	N/A
1	TD1+	Channel 1 Transmitter DATA In	LVPECL
2	VEE1	Channel 1 Signal Ground	N/A
3	TD1-	Channel 1 Transmitter DATA In	LVPECL
4	VCC1	Channel 1 Power Supply	N/A
5	TDIS2	Channel 2 Transmit Disable input Logic 1 = Disable Optical Output Logic 0 = Enable Optical Output Internal 4.7K ohm pull-down (enable)	LVTTL
6	TDIS1	Channel 1 Transmit Disable input Logic 1 = Disable Optical Output Logic 0 = Enable Optical Output Internal 4.7K ohm pull-down (enable)	LVTTL
7	TD2+	Channel 2 Transmit DATA In	LVPECL
8	VCC2	Channel 2 Power Supply	N/A
9	TD2-	Channel 2 Transmite DATA In	LVPECL
10	VEE2	Channel 2 Signal Ground	N/A

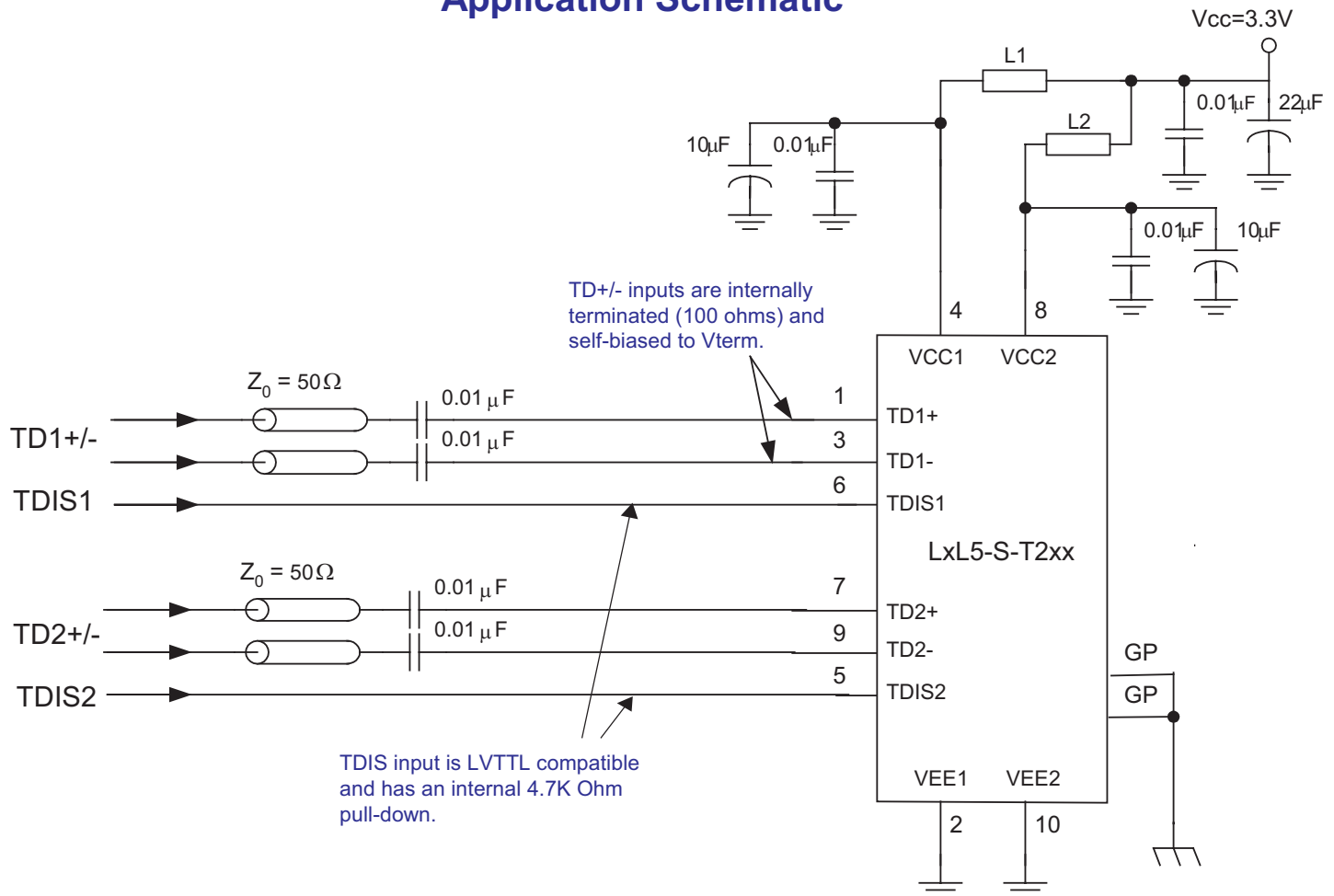
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Application Schematic



Notes:

- 1) L1 and L2 = MuRata BLM21A601S or equivalent (600Ω at 100MHz or better).
- 2) Route the differential pairs (TD +/-) together using 50 Ω impedance matched traces.
- 3) Use separate power supply filtering for VCC1 and VCC2 as shown.
- 4) Use low ESR capacitors such as NPO or COG for AC Coupling of the TD+/- 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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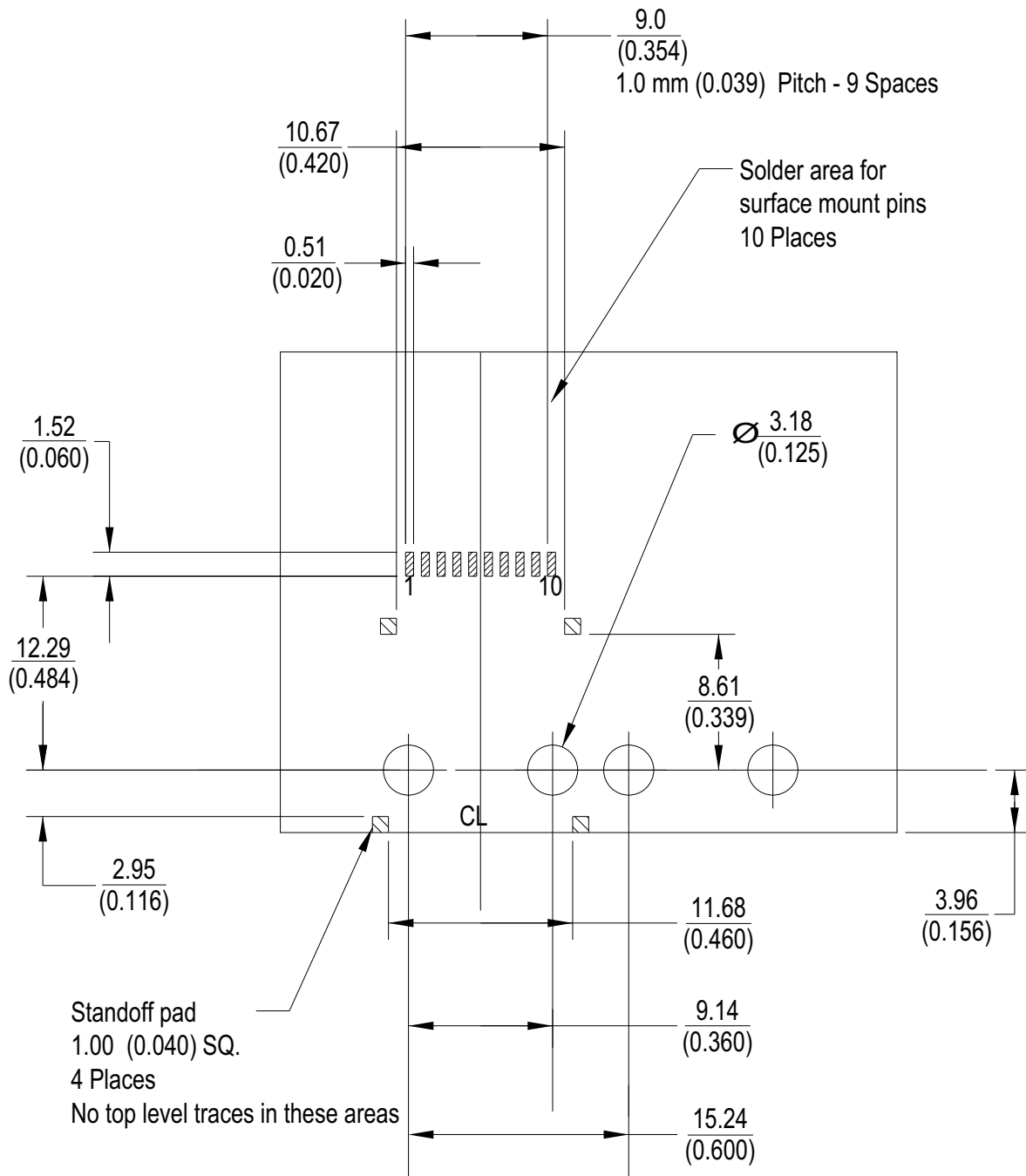
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PRELIMINARY

LOW PROFILE OPTICAL TRANSCEIVER PCB FOOTPRINT

Dimensions Are Shown As: $\frac{\text{mm}}{\text{(inches)}}$



Top View Shown



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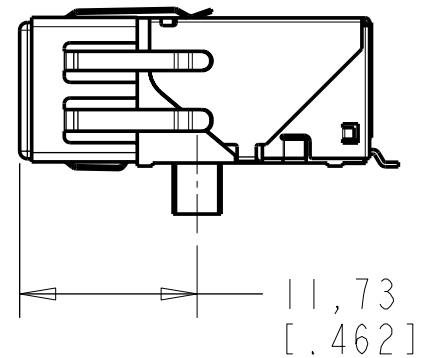
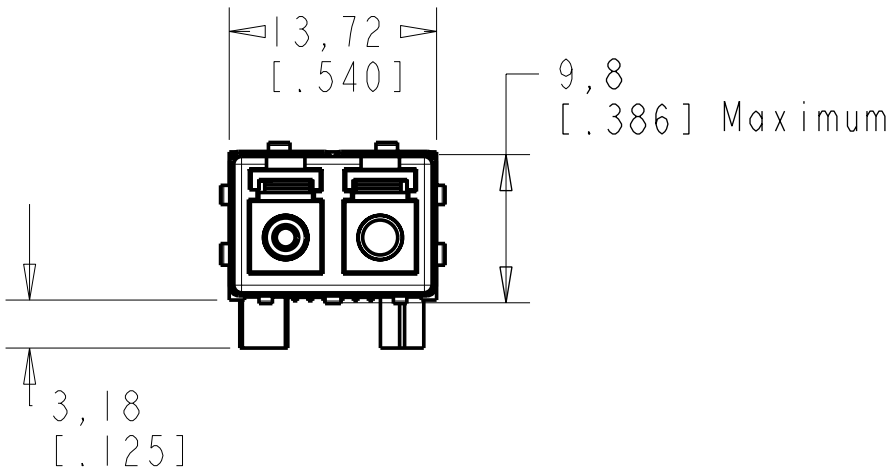
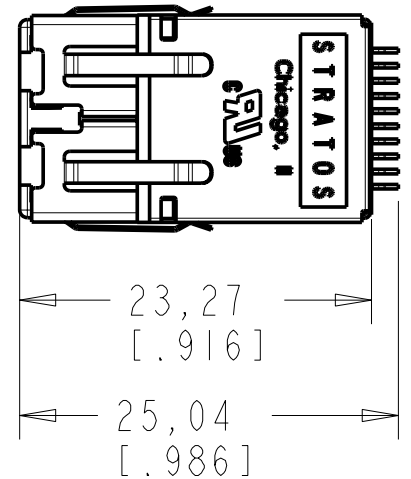
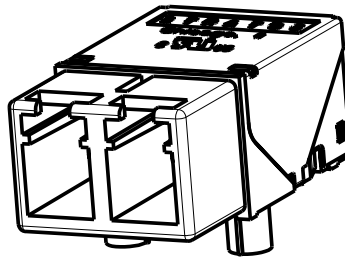
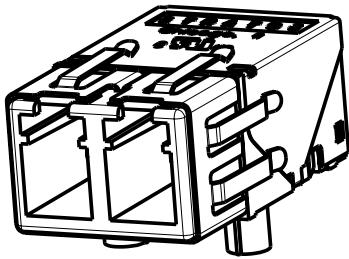
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PRELIMINARY

MECHANICAL DETAIL (SOLDER POST VERSION)

GROUND CLIP SHELL

FLAT SHELL



RECOMMENDED PANEL CUT-OUT
for PROPER GROUND CLIP CONTACT
is 0.400 X 0.560 INCHES.

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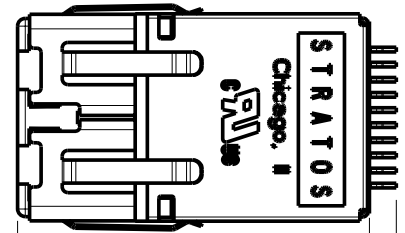
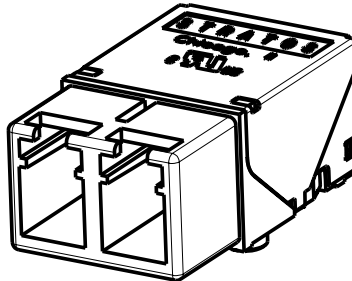
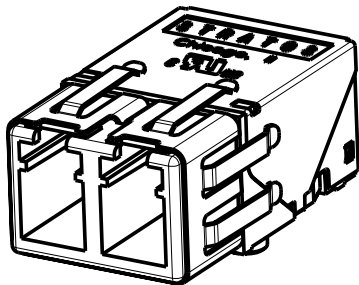
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MECHANICAL DETAIL (SCREW POST VERSION)

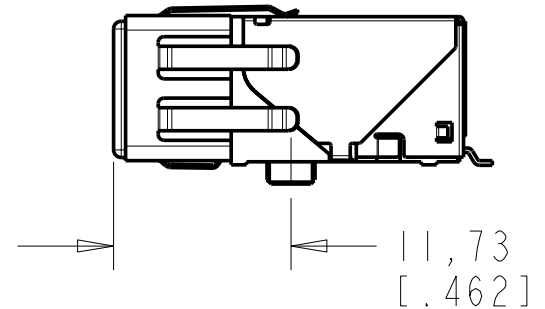
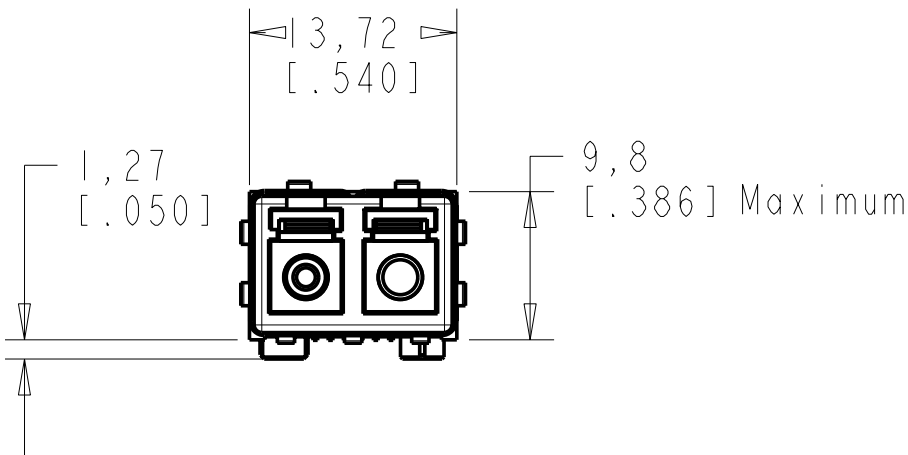
GROUND CLIP SHELL

FLAT SHELL



23,27
[.916]

25,04
[.986]



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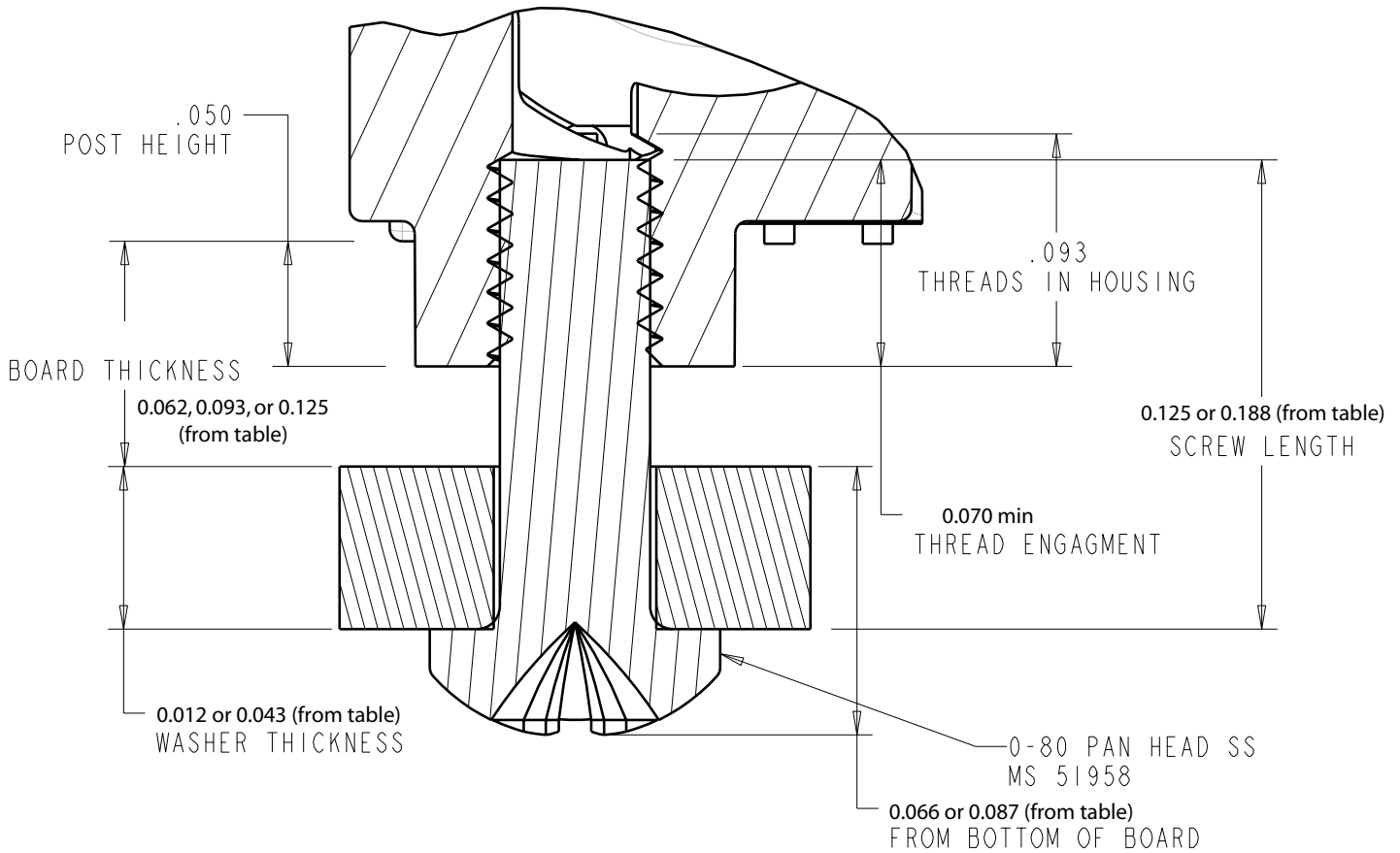
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PCB Nominal Thickness	Screw Length	Washer Thickness	Screw/Washer Height	Order Stratos Washer	Order Stratos Screw
0.062 in +/- 0.005	0.125 in	0.043 in	0.087 in	751-00002	618-00001
0.093 in +/- 0.005	0.125 in	0.012 in	0.066 in	751-00001	618-00001
0.125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

Notes:

1) Customer may choose to any type 0-80 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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Part Number	Link Margin (dB)	Flat Shell	Clip Shell	Conf Coat	Solder Posts	Screw Posts
LNL5-S-T2H	5	X			X	
LNL5-S-T2M	5	X		X	X	
LNL5-S-T2HB	5	X				X
LNL5-S-T2MB	5	X		X		X
LTL5-S-T2H	5		X		X	
LTL5-S-T2M	5		X	X	X	
LTL5-S-T2HB	5		X			X
LTL5-S-T2MB	5		X	X		X

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