



## LxG-LP12xx LOW PROFILE OPTICAL TRANSCEIVER

OC3 / STM1 SONET / SDH Applications  
 3.3V, 1310nm FP Laser, Singlemode,  
 Up to 15 KM Distance

### FEATURES

- 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
- Full compliance Bellcore / Telcordia GR-253
- EN-60825/ IEC-825 / CDRH Class 1 Compliant
- Optional Parylene C Conformal Coating

### APPLICATIONS

The LxG-LT12xx multimode optical fiber transceivers provide low profile, cost effective solutions for OC-3 or STM1 singlemode optical fiber data links with a duplex LC connector interface.

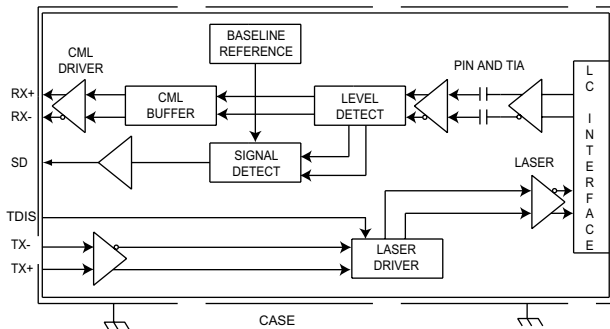
These transceivers are fully compliant with Bellcore / Telcordia GR-253 standards but can be used for any other data communications purpose within their operating parameters.

### DESCRIPTION

The LxG-LT12xx fiber optic transceivers consist of transmitter and receiver functions combined in a Low Profile RJ Format module. The optical transmitter is a 1310nm FP laser. 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 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 LVTTTL 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.

### BLOCK DIAGRAM



### ORDERING INFORMATION

**L X G - LP 12 X X**

Product Family	Shell Options	Application	Optical Wavelength, Signal Detect, Fiber	Temperature and Coating	Mounting
<b>L=</b> Low Profile RJ XCVR	<b>N=</b> No GND Tabs (Flat Shell)	<b>G=</b> OC3 / STM1 (155 Mbps)	<b>LP12=</b> 1310 nm Singlemode, LVPECL Signal Detect 3.3VDC Power	<b>H=</b> -40 to 85 C, No Coating	<b>BLANK=</b> Solder Posts (0.125 length)
	<b>T=</b> GND Tabs			<b>M=</b> -40 to 85 C, Conformal Coating	<b>B=</b> Screw Posts (0.50 length)

**L \_ \_ G - LP 12 \_ \_**



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## ABSOLUTE MAXIMUM RATINGS

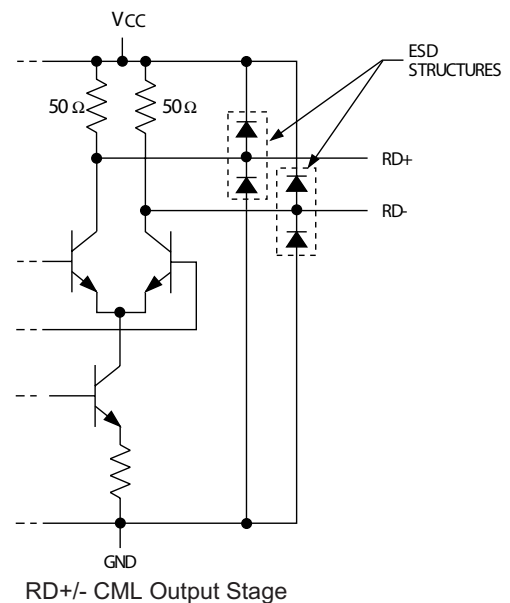
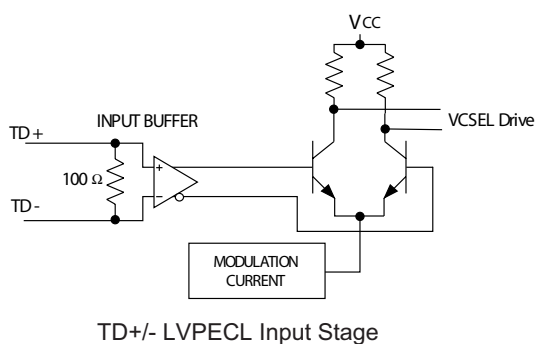
Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values 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
RX Data Output Load	$R_L$		50		Ohms

## DETAIL OF DATA I/O STAGES



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## TRANSMITTERS

VCCTX = 3.15V to 3.45V,  $T_A$  = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power <sup>1</sup>	$P_o$	-15		-8	dBm
Optical Output Wavelength	$\lambda_{OUT}$	1263	1310	1360	nm
Spectral Width	$\Delta\lambda_{RMS}$			4.0	nm
Extinction Ratio	ER	8			dB
Supply Current	$I_{CC}$		120	160	mA
Optical Rise / Fall Time (20% - 80%)	$t_{R,F}$			0.26	nS
Relative Intensity Noise	RIN			-117	dB/Hz
Coupled Power Ratio	CPR	9			dB
Total Jitter	TJ			187	pS
Transmit Disable Voltage	$V_D$	$V_{CC}-1.3$		$V_{CC}$	V
Transmit Enable Voltage	$V_{EN}$	$V_{EE}$		$V_{EE}+0.8$	V

BER=10<sup>-10</sup> @ 155.52Mbps, PRBS 2<sup>23</sup>-1, NRZ, Compliant with Telcordia GR-253 and ITU recommendations G.957 and G.958

## RECEIVERS

VCCR<sub>X</sub> = 3.15V to 3.45V,  $T_A$  = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity <sup>1</sup>	$P_I$	-32	-35	-8	dBm
Optical Input Wavelength	$\lambda_{IN}$	1270		1355	nm
Optical Return Loss	ORL	12			dB
Supply Current	$I_{CC}$		70	120	mA
Signal Detect Assert Time	$t_{SDAS}$		<10	100	$\mu$ S
Signal Detect Deassert Time	$t_{SDDA}$		<10	350	$\mu$ S
Signal Detect Deassert Level	$SD_{OFF}$	-45			dBm
Signal Detect Assert Level	$SD_{ON}$			-32	dBm
Signal Detect Hysteresis	HYS	1.5	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

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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

## REGULATORY COMPLIANCE

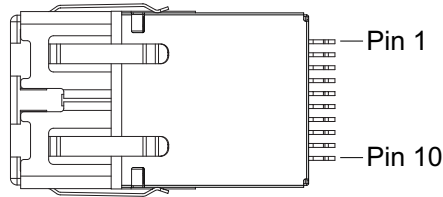
Requirement	Feature	Condition	Notes
MIL-STD-883-3015.7	ESD	Class II	2200V
IEC-801-2	ESD	Human Body Model	25KV
IEC-801-3	EMI	Immunity	10V/M
FCC	EMI	Class B	>20dB
EN 55022 (CISPR 22A)	EMI	Class B	10V/M
IEC-825 Issue 1993-11	Eye Safety	Class 1	TUV Certificate Number One File
FDA CDRH 21-CFR 1040	Eye Safety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

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Low Profile Optical Transceiver  
Top View Shown



## PIN FUNCTIONS

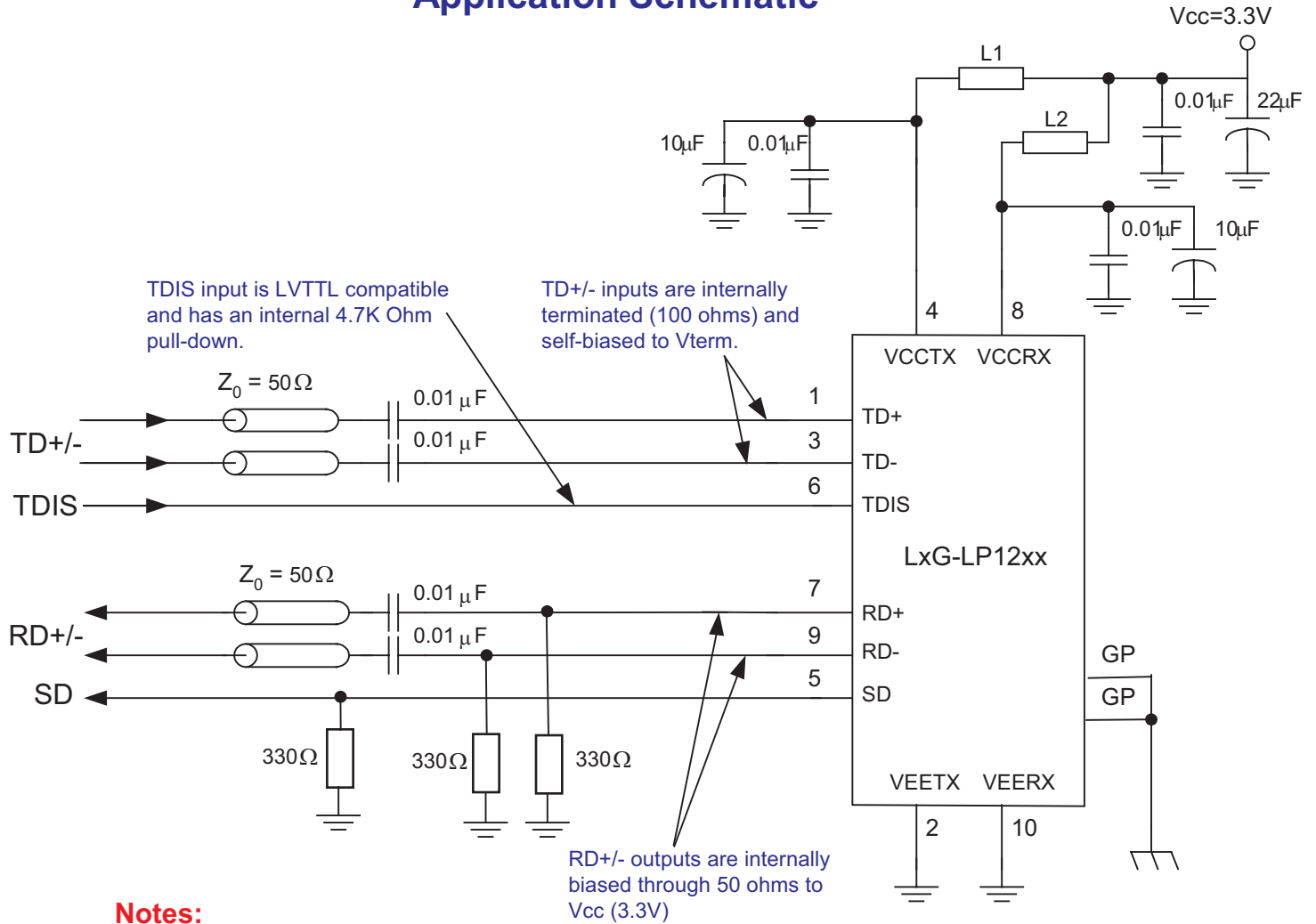
Pin Number	Symbol	Description	Logic Family
GP	GP	Grounding Posts Connect to chassis ground	N/A
1	TD+	Transmitter DATA In	LVPECL
2	VEETX	Transmitter Signal Ground	N/A
3	TD-	Transmitter DATA In	LVPECL
4	VCCTX	Transmitter Power Supply	N/A
5	SD	Signal Detect output Satisfactory Optical Input: Logic "1" Output Fault Condition: Logic "0" Output	LVPECL
6	TDIS	Transmit Disable input Logic 1 = Disable Optical Output Logic 0 = Enable Optical Output Internal 4.7K ohm pull-down (enable)	LVTTTL
7	RD+	Receiver DATA Out	CML
8	VCCR <sub>X</sub>	Receiver Power Supply	N/A
9	RD-	Receiver DATA Out	CML
10	VEER <sub>X</sub>	Receiver Signal Ground	N/A

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## Application Schematic

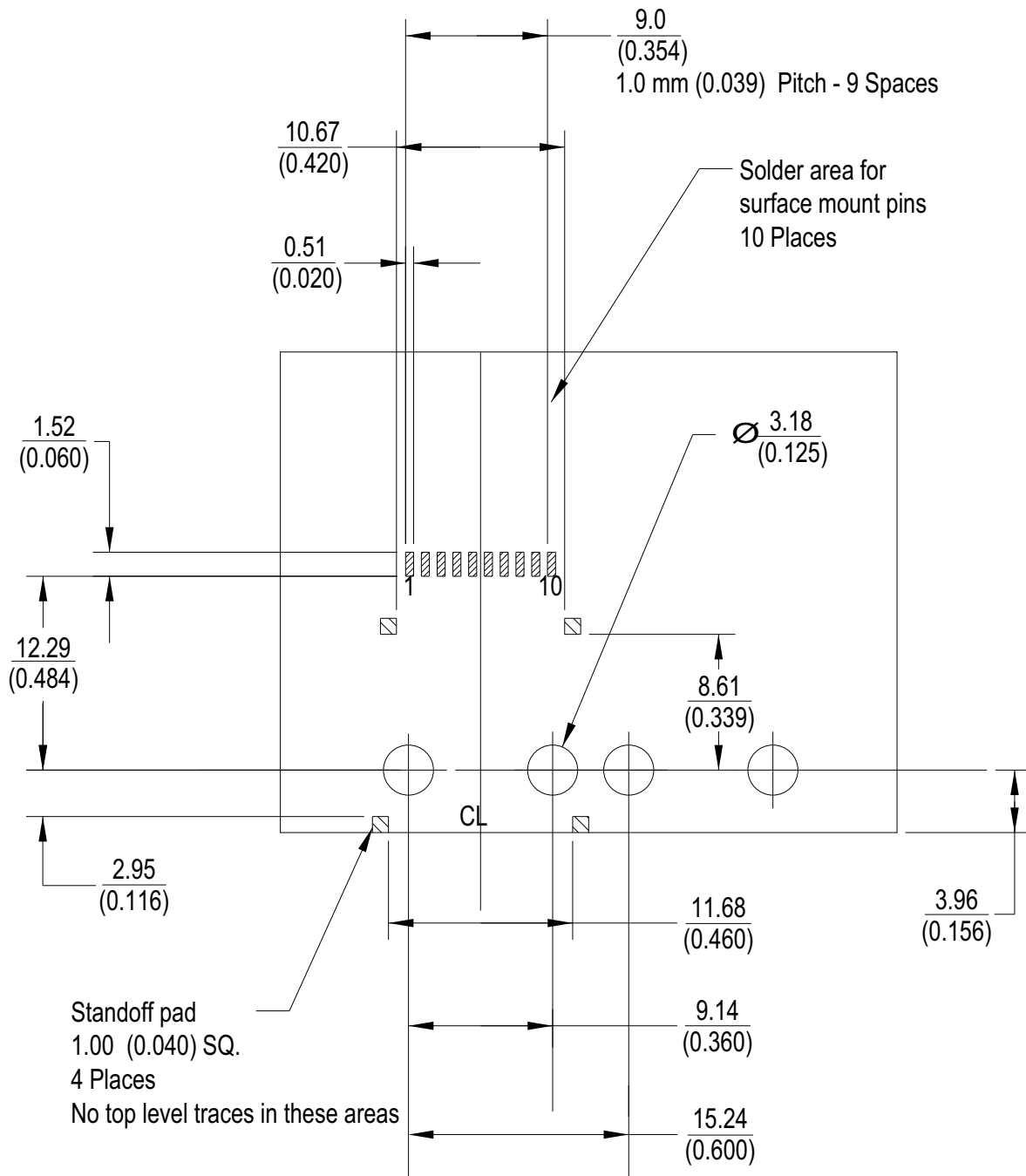


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## LOW PROFILE OPTICAL TRANSCEIVER PCB FOOTPRINT

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



Top View Shown



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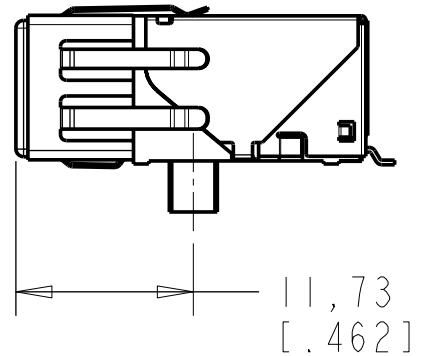
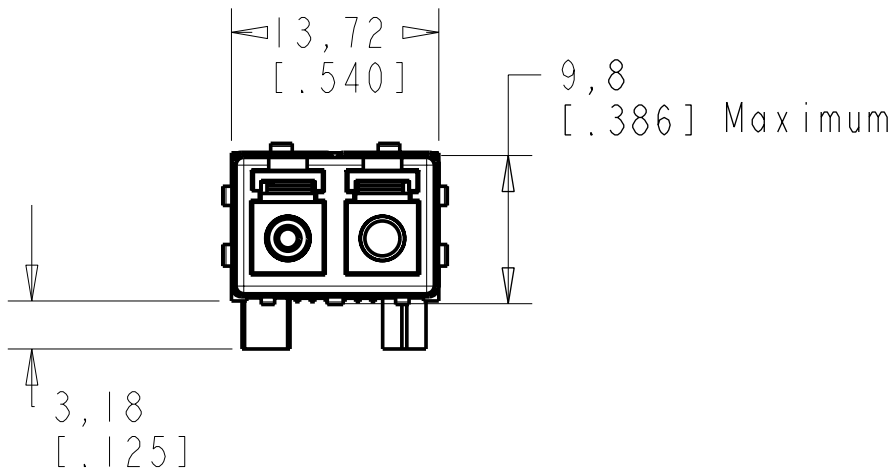
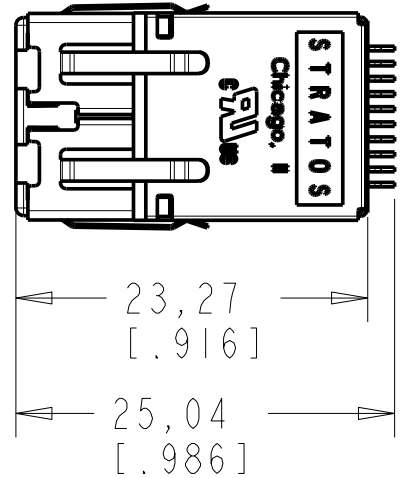
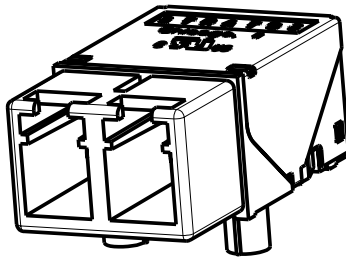
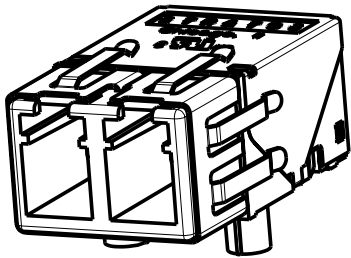
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## MECHANICAL DETAIL (SOLDER POST VERSION)

GROUND CLIP SHELL

FLAT SHELL



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

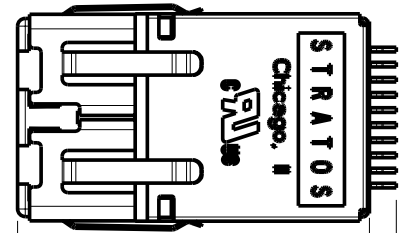
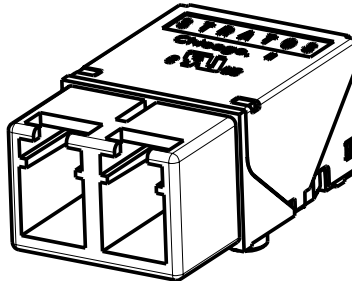
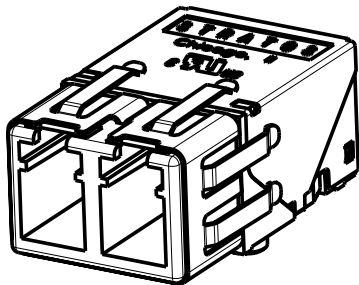
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## MECHANICAL DETAIL (SCREW POST VERSION)

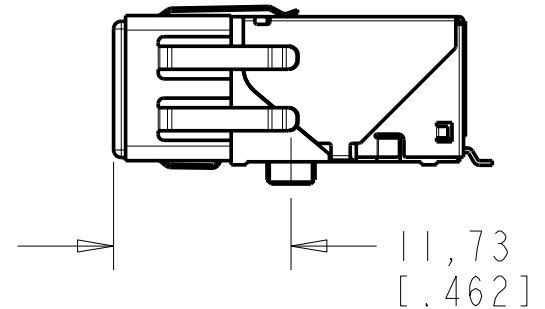
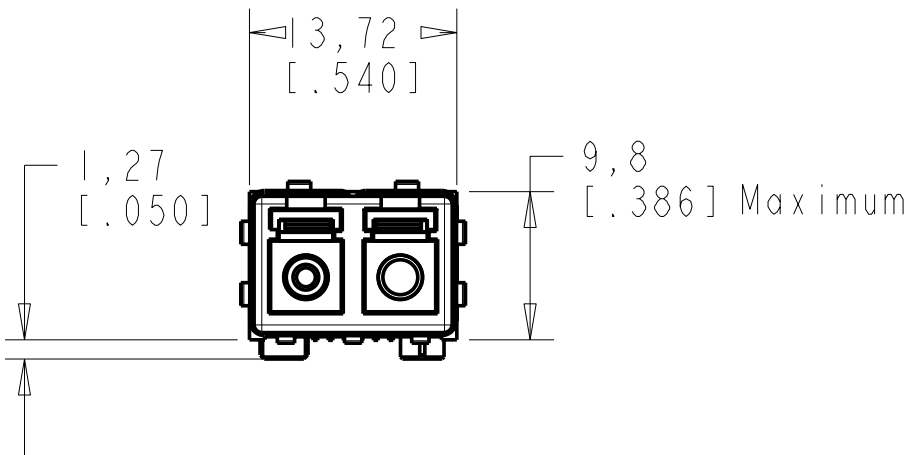
GROUND CLIP SHELL

FLAT SHELL



23,27  
[.916]

25,04  
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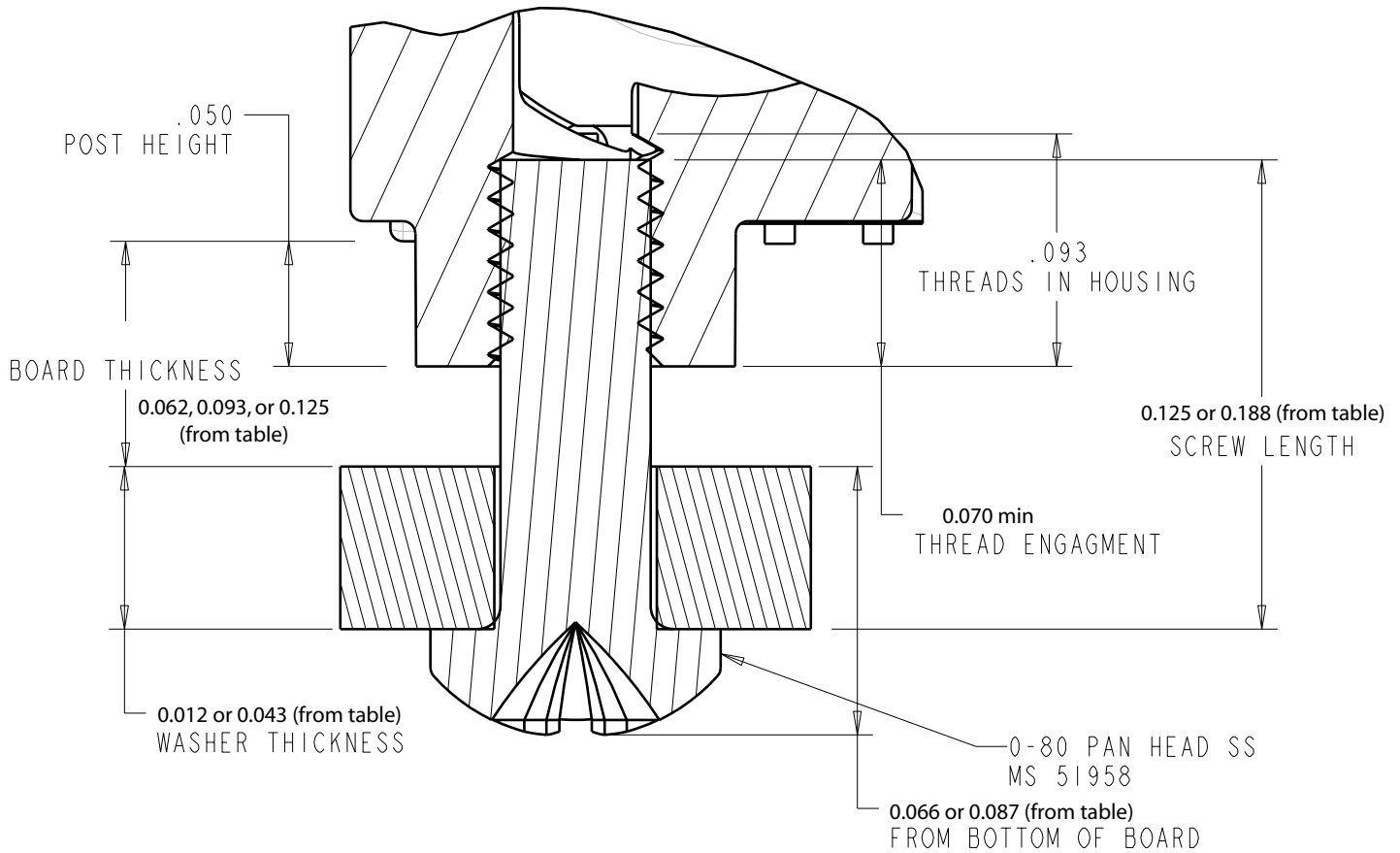
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PCB Nominal Thickness	Screw Length	Washer Thickness	Screw/Washer Height	Order Stratos Washer	Order Stratos Screw
0.062 in +/- 0.005	0.125 in	0.043 in	0.087 in	751-00002	618-00001
0.093 in +/- 0.005	0.125 in	0.012 in	0.066 in	751-00001	618-00001
0.125 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 SUMMARY AND OPTIONS

Part Number	Flat Shell	Clip Shell	Conf Coat	Solder Posts	Screw Posts
LNG-LP12H	X			X	
LNG-LP12M	X		X	X	
LNG-LP12HB	X				X
LNG-LP12MB	X		X		X
LTG-LP12H		X		X	
LTG-LP12M		X	X	X	
LTG-LP12HB		X			X
LTG-LP12MB		X	X		X

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