TECH PUBLIC
台舟电子

关注公众号

ESD5V0B5-01005

01005 Size 1-Line ESD Protection

www.sot23.com.tw

Features

- High ESD withstand voltage: +/-15kV (contact) and +/-15kV (air)per IEC 61000-4-2
- Ultra-small 01005 package
- Protects one line
- Low ESD clamping voltage
- Working voltage: 5V
- Capacitance: 6.5pF Typical
- Low leakage current
- Low dynamic resistance
- Solid-state silicon-avalanche technology

Mechanical Characteristics

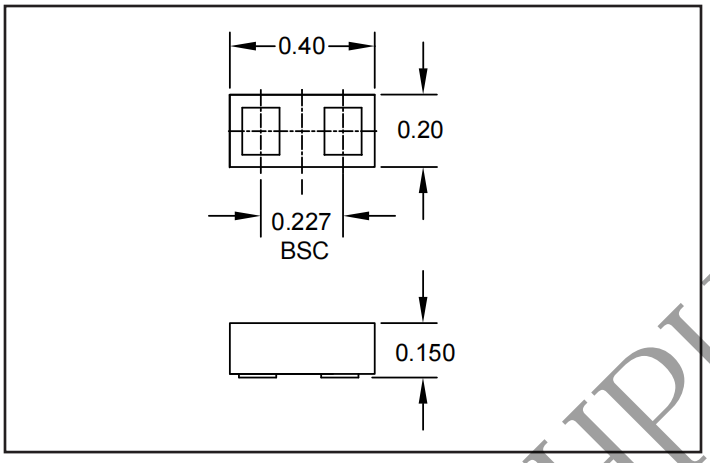
- SLP0402P2X4F package
- Pb-Free, Halogen Free, RoHS/WEEE compliant
- Nominal Dimensions: 0.4 x 0.2 x 0.15 mm
- Lead Finish: NiAu
- Marking: Marking code
- Packaging: Tape and Reel

RoHS

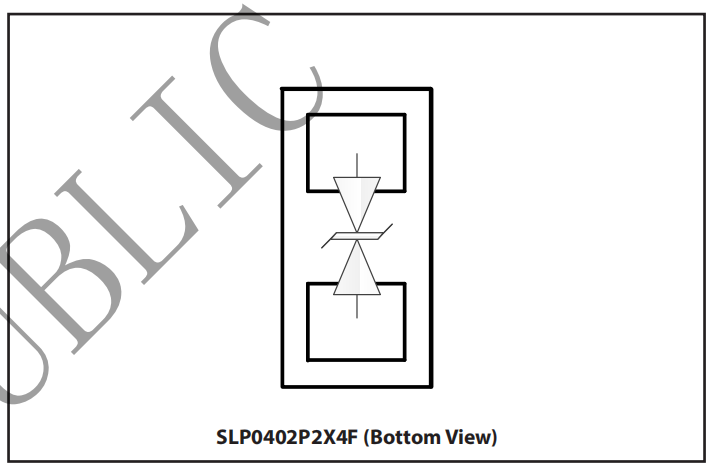
Applications

- Cellular Handsets & Accessories
- Keypads, Side Keys, Audio Ports
- Portable Instrumentation
- Notebook Computers
- Tablet PC

Package Dimension



Schematic & Pin Configuration



SLP0402P2X4F (Bottom View)

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Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (tp = 1.2/50μs)	P_{PK}	30	W
Peak Pulse Current (tp = 1.2/50μs)	I_{PP}	2	A
ESD per IEC 61000-4-2 (Air)(1) ESD per IEC 61000-4-2 (Contact)(1)	V_{ESD}	±15 ±15	kV
Operating Temperature	T_J	-40 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Characteristics (T=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}	T = -40 to +125			5	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA	6.5	8	9.5	V
Reverse Leakage Current	I_R	V_{RWM} = 5V		5	25	nA
Clamping Voltage	V_C	I_{PP} = 2A, tp = 8/20μs			15	V
ESD Clamping Voltage[2]	V_C	I= 4A, tlp = 0.2/100ns		11		V
		I=16A, tlp = 0.2/100ns		18.5		
Dynamic Resistance[2,3]	R_{DYN}	tlp = 0.2/100ns		0.62		Ω
Junction Capacitance	C_j	V_R = 0V, f = 1MHz		6.5	9	pF

Notes

1) Measured with a 20dB attenuator, 50 Ohm scope input impedance, 2GHz bandwidth. ESD gun return path connected to ESD ground plane.

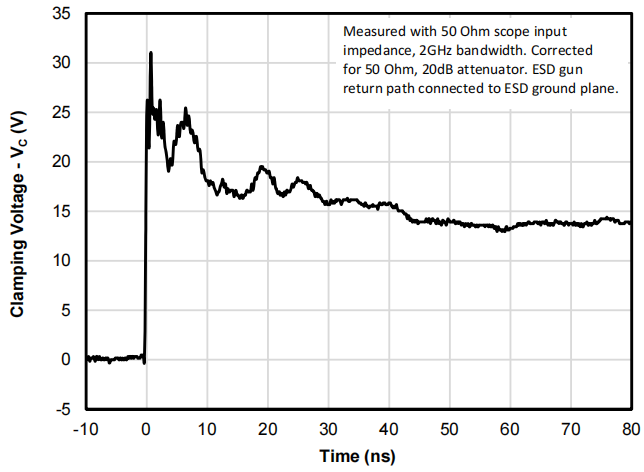
2) Transmission Line Pulse Test (TLP) Settings: tp = 100ns, tr = 0.2ns, I_{TLP} and V_{TLP} averaging window: t1 = 70ns to t2 = 90ns.

3) Dynamic resistance calculated from I_{TLP} = 4A to I_{TLP} = 16A

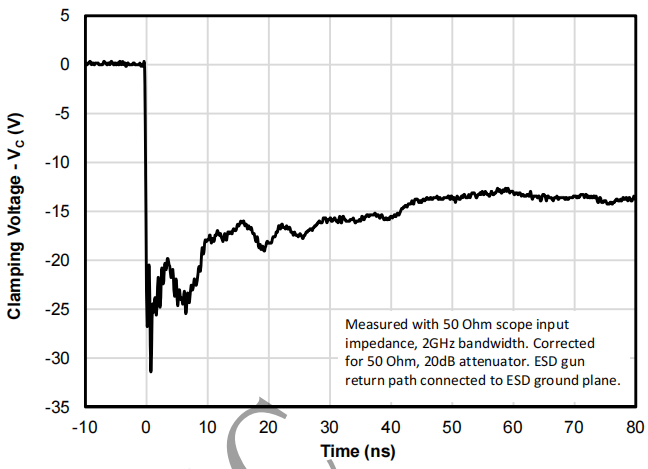
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Typical Characteristics

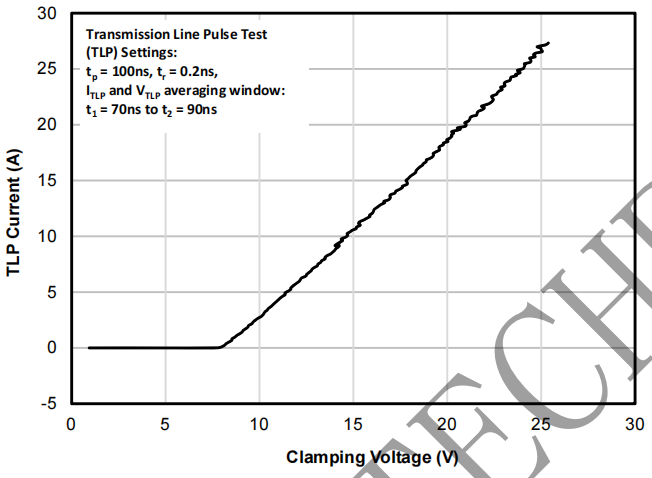
ESD Clamping (8kV Contact per IEC 61000-4-2)



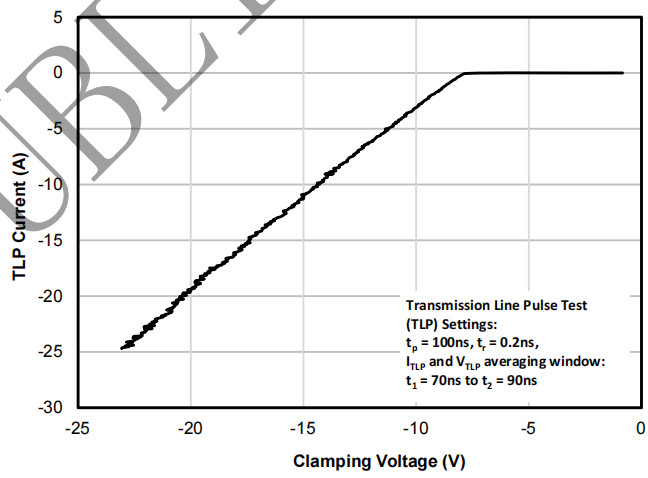
ESD Clamping (-8kV Contact per IEC 61000-4-2)



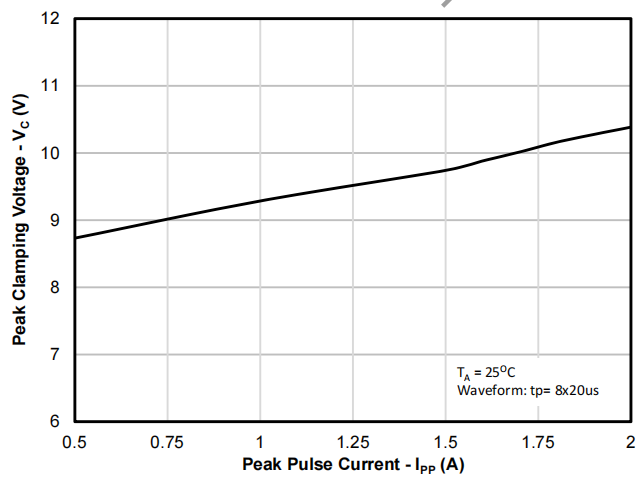
TLP Characteristic (Positive Pulse)



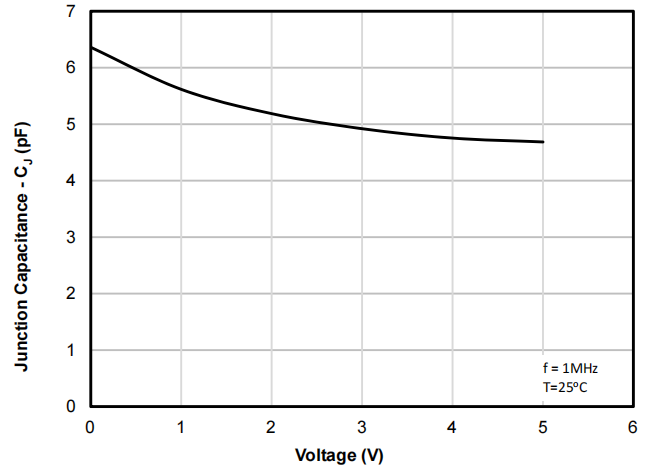
TLP Characteristic (Negative Pulse)



Clamping Characteristic (8/20us Waveform)



Capacitance vs. Reverse Voltage



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Application Information

Assembly Guidelines

The small size of this device means that some care must be taken during the mounting process to insure reliable-solder joints. The figure at the right details TECHPUBLIC's recommended mounting pattern. Recommended assembly guidelines are shown in Table 1. Note that these are only recommendations and should serve only as a starting point for design since there are many factors that affect the assembly process. Exact manufacturing-parameters will require some experimentation to get the desired solder application. techpublic's recommend edmounting pattern is based on the following design guidelines:

Land Pattern

The recommended land pattern follows IPC standards and is designed for maximum solder coverage. Detailed dimensions are shown elsewhere in this document.

Solder Stencil

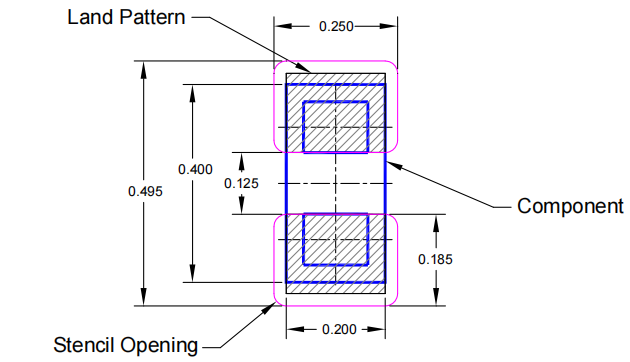
Stencil design is one of the key factors which will deter-mine the volume of solder paste which is deposited onto the land pad. The area ratio of the stencil aperture will determine how well the stencil will print. The area ratio takes into account the aperture shape, aperture size, and stencil thickness. An area
ratio of 0.70 – 0.75 is preferred for the subject package. The area ratio of a rectangular aperture is given as:

Area Ratio = (L * W)/ (2 * (L + W) * T)

Where:
L = Aperture Length
W = Aperture Width
T = Stencil Thickness

techpublic recommends a stencil thickness of 0.100mm for this device. The stencil should be laser cut with electrop-olishedfinish. The stencil should have a positive taper of approximately 5 degrees. Electro polishing and tapering the walls results in reduced surface friction and better paste release. For small pitch components, Semtech recommends a square aperture with rounded corners for consistent solder release. Due to the small aperture size, a solder paste with Type 4 or smaller particles are recom-mended.

Recommended Mounting Pattern



All Dimensions are in mm.

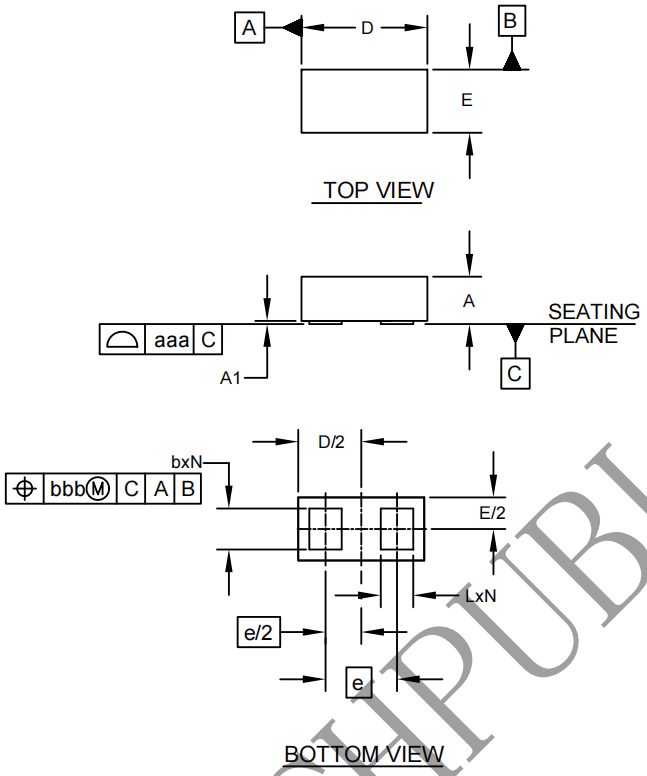
Land Pad. **Stencil opening** **Component**

Assembly Parameter	Recommendation
Solder Stencil Design	Laser cut, Electro-polished
Aperture shape	Rectangular with rounded corners
Solder Stencil Thickness	0.100 mm (0.004")
Solder Paste Type	Type 4 size sphere or smaller
Solder Reflow Profile	Per JEDEC J-STD-020
PCB Solder Pad Design	Non-Solder mask defined
PCB Pad Finish	OSP OR NiAu

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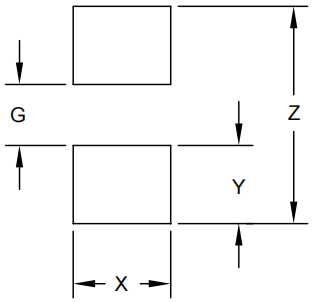
Outline Drawing - SLP0402P2X4F



DIMENSIONS			
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.125	0.150	0.175
A1	0.000	0.010	0.050
b	0.115	0.135	0.150
D	0.370	0.400	0.430
E	0.170	0.200	0.230
e	0.227 BSC		
L	0.088	0.108	0.123
N	2		
aaa	0.08		
bbb	0.10		

NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).

Land Pattern - SLP0402P2X4F



DIMENSIONS	
DIM	MILLIMETERS
G	0.125
X	0.200
Y	0.160
Z	0.445

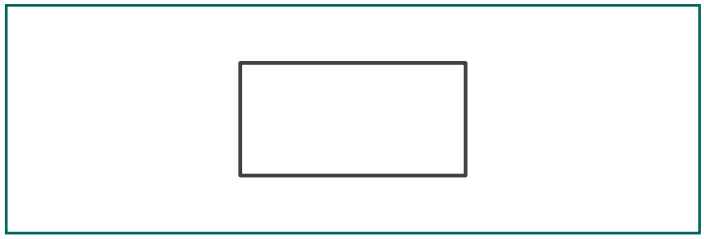
NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY.
   CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR
   COMPANY'S MANUFACTURING GUIDELINES ARE MET.

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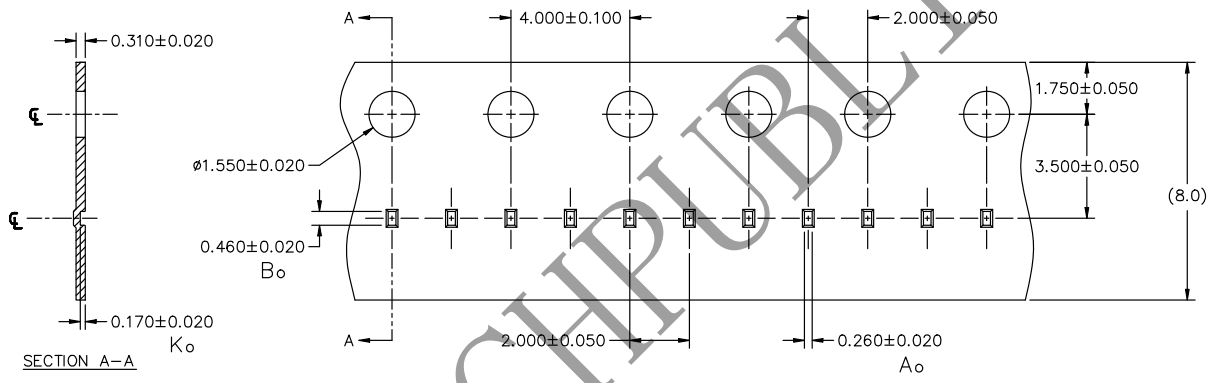
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Marking Code



Tape and Reel Specification



CUMULATIVE TOLERANCE OF 10 SPROCKET HOLES IS ±0.200mm.

NOTES: ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

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