

# TVS Diode Arrays

## TVS Avalanche Diode in a Chip Scale Package

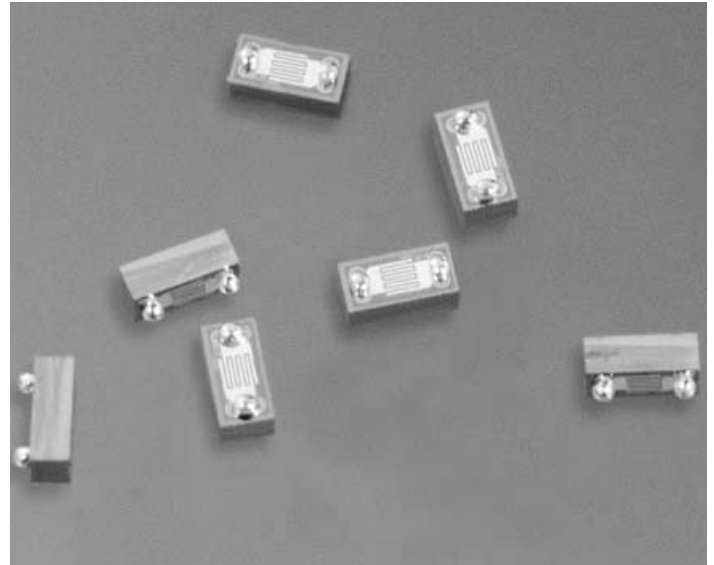
### SP0501BACT

The product is a silicon P/N structure tailored for ESD protection and is offered in the standard EIA 0402 size. The single channel Chip Scale device is used to help protect sensitive digital or analog input circuits on data, signal, or control lines with voltage levels up to 5VDC. The bipolar device is ideal for protection where AC signals are present.

The state-of-the-art device is designed to suppress ESD and other transient over-voltage events to meet the International Electrotechnical Comptability (EMC transient immunity standards IEC 61000-4-2 for Electrosatic Discharge Requirements). The monolithic silicon device is comprised of specially designed structures for transient voltage suppression (TVS). The size and shape of these structures has been tailored for transient protection. The low capacitance and clamp voltage are ideal for high speed signal line protection.

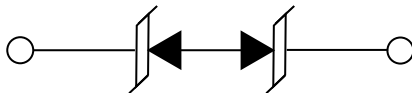
#### Ordering Information

Part Number	Diode Channels	Bumps	Package Size mils (mm)	Quantity Per Reel
SP0501BACT	1	2	40x20 (1x 0.5)	3500



#### Schematic

SP0501BAC



#### Features

- Single channel suppressor in an EIA 0402 device size
- ESD Capability
  - IEC 61000-4-2, Direct Discharge .....30kV (Level 4)
  - IEC 61000-4-2, Air Discharge .....30kV (Level 4)
  - MIL STD 883D (Method 3015.7) .....30kV
- Signal line protection for applications up to 5VDC
- Fast response time .....< 1ns
- Low input capacitance .....30pF Typical
- Low clamp voltage (8kV test) .....13V Typical
- Low input leakage .....1nA @ 3.3V Typical
- Operating temperature range .....-40°C to 85°C

#### Applications

- Cell phone handsets
- Personal Digital Assistants (PDA)
- Portable handheld equipment (Laptop, Palmtop computers)
- Computer port, keyboard (USB1.1)
- Set-Top Box (Audio and Video ports)
- PCMCIA cards

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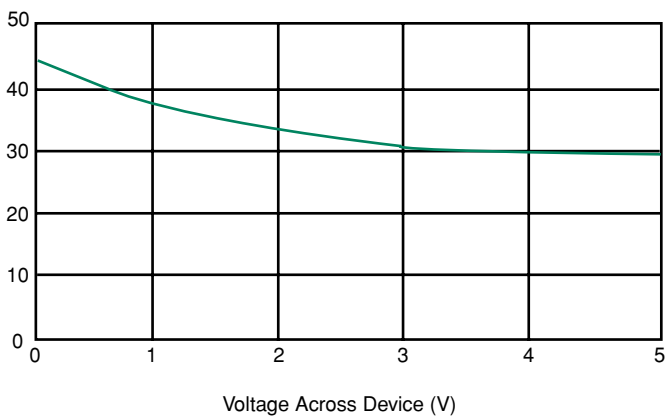
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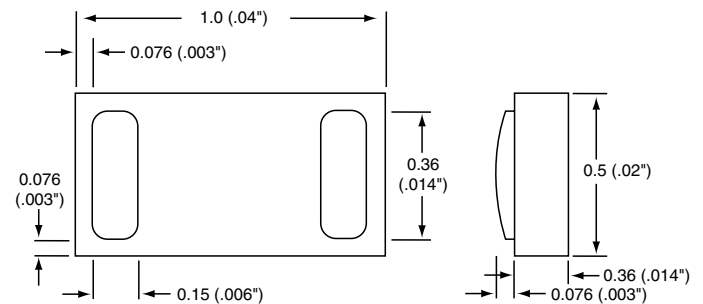
### Electrical Specifications $T_A = 25^\circ\text{C}$ Unless Otherwise Specified

PARAMETER	TEST CONDITIONS	MIN	TYPICAL	MAX	UNITS
Reverse Standoff Voltage	$I = 10\mu\text{A}$	$\pm 5.9$	-	-	V
Reverse Standoff Leakage Current	$V = 5.5\text{V}$		1	100	$\mu\text{A}$
Signal Clamp Voltage					
Positive	$I = 10\text{mA}$	6.0	7.5	9.2	V
Negative	$I = 10\text{mA}$	-9.2	- 7.5	- 6.0	V
Clamp Voltage during ESD					
MIL-STD 883D (Method 3015.7)	8kV		13		V
ESD Test Level					V
IEC-61000-4-2, Contact discharge		30			kV
MIL-STD-883D Method 3015 (HBM)		30			kV
Capacitance	5V @ 1Mhz		30		pF
Turn on/off Time			<1		ns
Temperature Range					
Operating		-40		85	$^\circ\text{C}$
Storage		-65		150	$^\circ\text{C}$

Typical Device Capacitance vs. Voltage



Outline Drawing



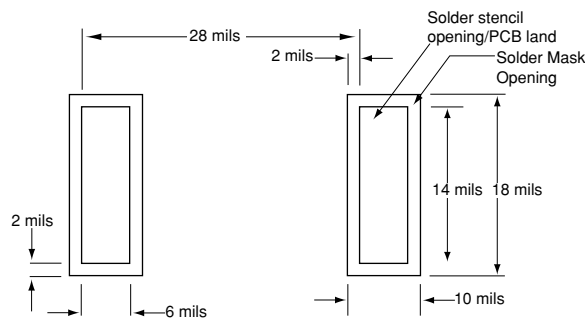
NOTE\*\* Metal Bump: 63/37 (Sn/Pb) alloy

# TVS Diode Arrays

## TVS Avalanche Diode in a Chip Scale Package

### SP0501BACT

Printed Circuit Board Recommendations	
Pad Size in PCB	14 x 6 mils (0.356 x 0.152mm)
Pad Shape	Rectangle
Pad Definition	Non Solder Mask Defined Pads (NSMD)
Solder Mask Opening	18 x 10 mils (0.457 x 0.254mm)
Solder Stencil Thickness	6 mils (0.152mm)
Solder Stencil Aperture Opening	14 x 6 mils (0.356 x 0.152mm)
Solder Flux Ratio	50/50
Solder Paste Type	No Clean
Board Trace Finish	Organic Solderable Preservative (OSP) (Enteck: Cu Plus 106A)



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### Typical Solder Reflow Thermal Profile (No-Clean Flux)

