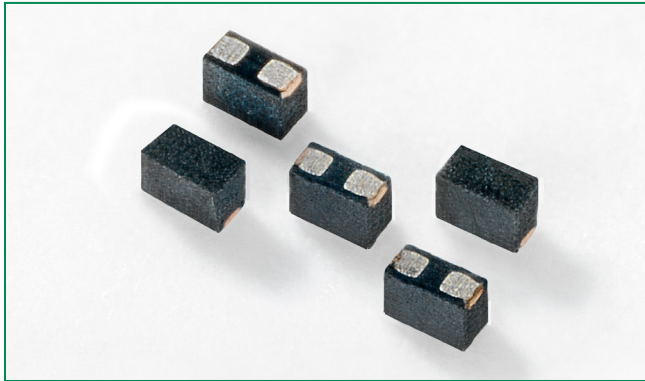


SP1006 Series 25pF 30kV Unidirectional Discrete TVS



**Pinout**



**Functional Block Diagram**



**Additional Information**



**Description**

Zener diodes fabricated in a proprietary silicon avalanche technology protect each I/O pin to provide a high level of protection for electronic equipment that may experience destructive electrostatic discharges (ESD). These robust diodes can safely absorb repetitive ESD strikes at  $\pm 30\text{kV}$  (contact discharge, IEC 61000-4-2) without performance degradation. Additionally, each diode can safely dissipate 5A of 8/20 $\mu\text{s}$  surge current (IEC 61000-4-5, 2nd Edition) with very low clamping voltages.

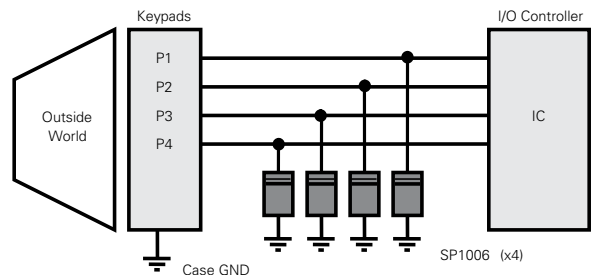
**Features**

- RoHS compliant and Lead-free
- ESD, IEC 61000-4-2,  $\pm 30\text{kV}$  contact,  $\pm 30\text{kV}$  air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, IEC 61000-4-5, 2nd Edition, 5A (8/20 $\mu\text{s}$ )
- Low leakage current of 0.5 $\mu\text{A}$  (MAX) at 5V
- Space efficient 0201 footprint)

**Applications**

- Mobile phones
- Smart phones
- PDAs
- Digital cameras
- Portable navigation devices
- Portable medical devices

**Application Example**



Life Support Note:

**Not Intended for Use in Life Support or Life Saving Applications**

The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.

### Absolute Maximum Ratings

Symbol	Parameter	Value	Units
$I_{PP}$	Peak Pulse Current ( $t_p=8/20\mu s$ )	5	A
$T_{OP}$	Operating Temperature	-40 to 125	°C
$T_{STOR}$	Storage Temperature	-55 to 150	°C

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

### Thermal Information

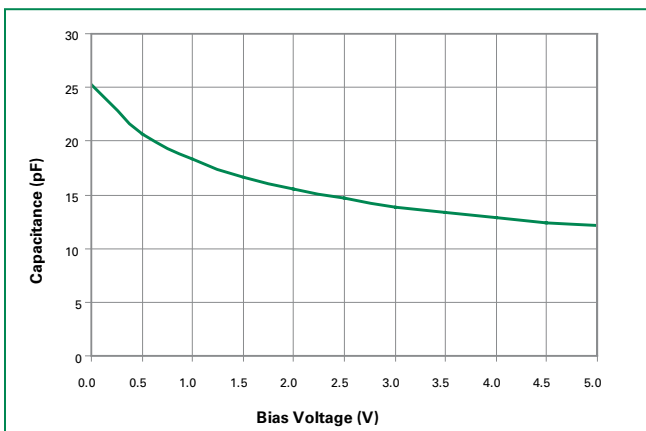
Parameter	Rating	Units
Storage Temperature Range	-55 to 150	°C
Maximum Junction Temperature	150	°C
Maximum Lead Temperature (Soldering 30s)	260	°C

### Electrical Characteristics ( $T_{OP}=25^\circ C$ )

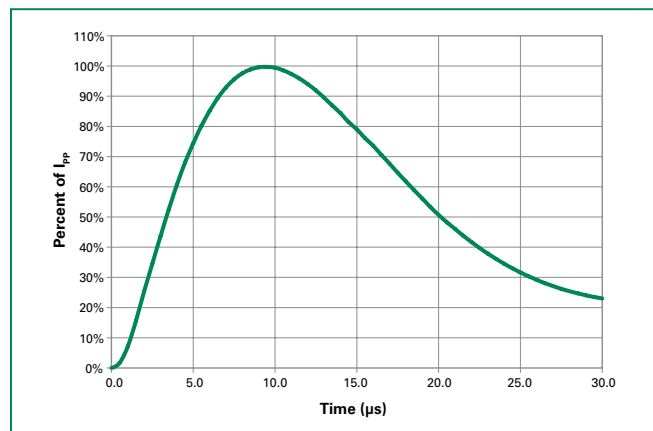
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	$V_{RWM}$				6.0	V
Breakdown Voltage	$V_{BR}$	$I_R=1mA$ (Pin 1 to 2)		7.8		V
Forward Voltage Drop	$V_F$	$I_R=1mA$ (Pin 2 to 1)		0.8		V
Leakage Current	$I_{LEAK}$	$V_R=5V$		0.1	0.5	$\mu A$
Clamp Voltage <sup>1</sup>	$V_C$	$I_{PP}=1A, t_p=8/20\mu s$ (Pin 1 to 2)		8.3		V
		$I_{PP}=2A, t_p=8/20\mu s$ (Pin 1 to 2)		9.2		V
Dynamic Resistance	$R_{DYN}$	$(V_{C2} - V_{C1}) / (I_{PP2} - I_{PP1})$		0.9		$\Omega$
ESD Withstand Voltage <sup>1</sup>	$V_{ESD}$	IEC 61000-4-2 (Contact Discharge)	$\pm 30$			kV
		IEC 61000-4-2 (Air Discharge)	$\pm 30$			kV
Diode Capacitance <sup>1</sup>	$C_D$	Reverse Bias=0V		25		pF
		Reverse Bias=2.5V		15		pF

Note: <sup>1</sup> Parameter is guaranteed by design and/or device characterization.

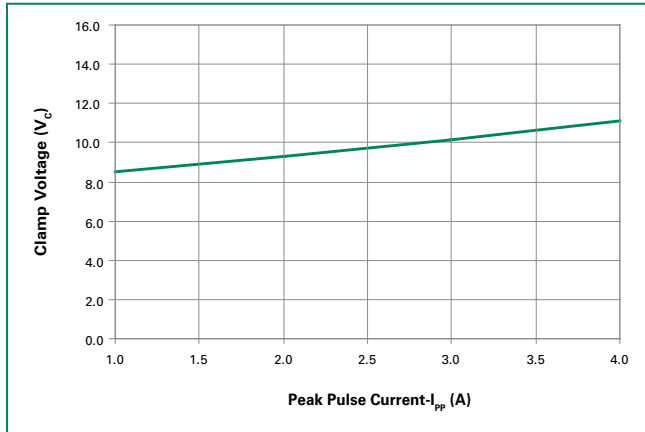
### Capacitance vs. Reverse Bias



### Pulse Waveform

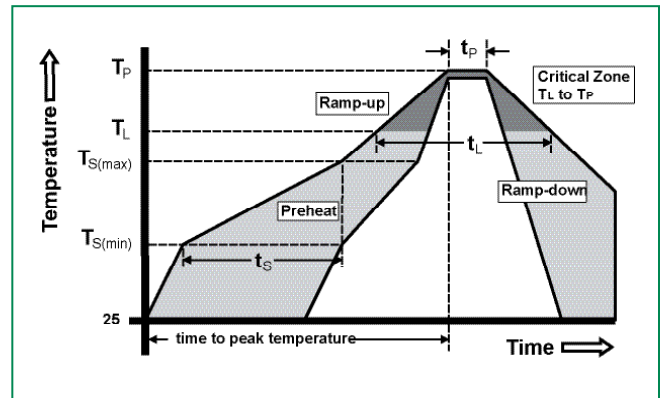


**Clamping Voltage vs.  $I_{pp}$**

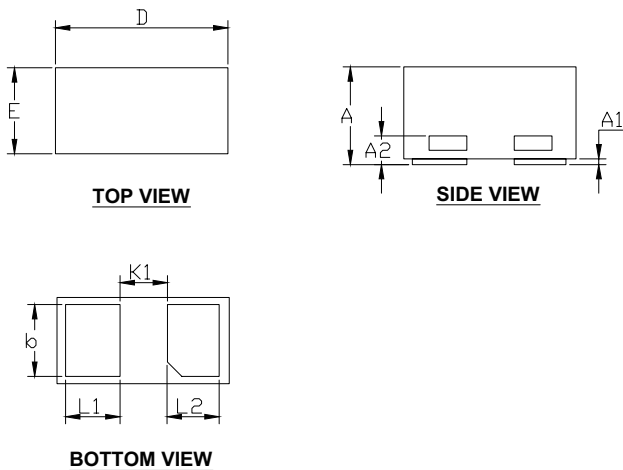


**Soldering Parameters**

Reflow Condition		Pb – Free assembly
Pre Heat	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 – 180 secs
Average ramp up rate (Liquidus) Temp ( $T_L$ ) to peak		3°C/second max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Temperature ( $t_L$ )	60 – 150 seconds
Peak Temperature ( $T_p$ )		260 <sup>+0/-5</sup> °C
Time within 5°C of actual peak Temperature ( $t_p$ )		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ( $T_p$ )		8 minutes Max.

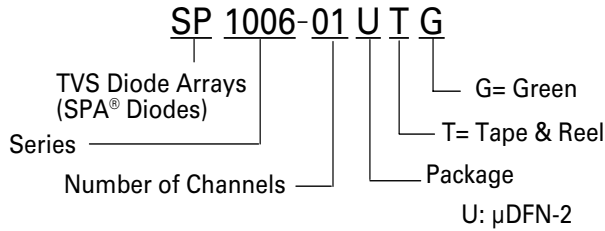


**Package Dimensions –  $\mu$ DFN-2 (0201)**



Package	$\mu$ DFN-2 (0201)		
JEDEC	MO-236		
Symbol	Millimeters		
	Min	Nom	Max
<b>A</b>	0.28	0.30	0.32
<b>A1</b>	0.00	0.02	0.05
<b>A2</b>	0.05	0.10	0.15
<b>b</b>	0.20	0.25	0.30
<b>D</b>	0.55	0.60	0.65
<b>E</b>	0.25	0.30	0.35
<b>L1</b>	0.14	0.19	0.24
<b>L2</b>	0.13	0.18	0.23
<b>K1</b>	0.165 REF		

**Part Numbering System**



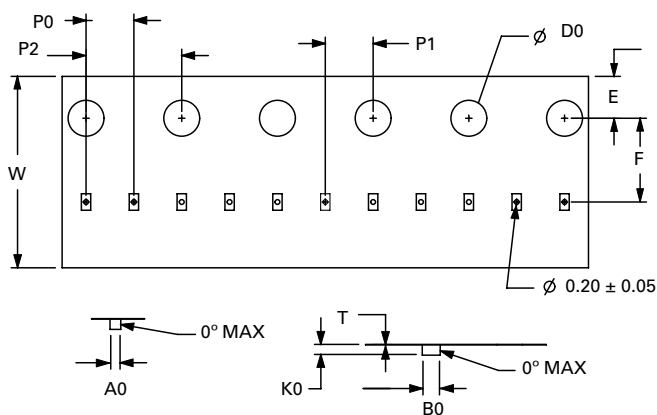
**Part Marking System**



**Ordering Information**

Part Number	Package	Marking	Min. Order Qty.
SP1006-01UTG	$\mu$ DFN-2		10000

**Embossed Carrier Tape & Reel Specification –  $\mu$ DFN-2**



Symbol	Millimetres		Inches	
	Min	Max	Min	Max
A0	0.36	0.42	0.014	0.017
B0	0.66	0.72	0.026	0.028
D0	1.40	1.60	0.055	0.063
E	1.65	1.85	0.065	0.073
F	3.45	3.55	0.136	0.140
K0	0.39	0.45	0.015	0.018
P0	1.95	2.05	0.077	0.081
P1	1.95	2.05	0.077	0.081
P2	3.90	4.10	0.154	0.161
T	0.18	0.22	0.007	0.009
W	7.90	8.30	0.311	0.327

**Product Characteristics**

<b>Lead Plating</b>	Pre-Plated Frame
<b>Lead Material</b>	Copper Alloy
<b>Lead Coplanarity</b>	0.0004 inches (0.102mm)
<b>Substitute Material</b>	Silicon
<b>Body Material</b>	Molded Epoxy
<b>Flammability</b>	UL 94 V-0

Notes :

1. All dimensions are in millimeters
2. Dimensions include solder plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. Blo is facing up for mold and facing down for trim/form, i.e. reverse trim/form.
5. Package surface matte finish VDI 11-13.

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