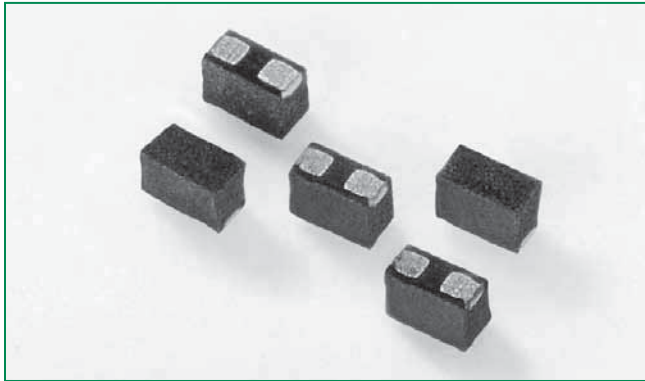
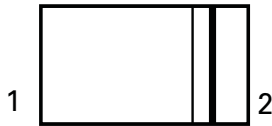


SP1006 Series 25pF 30kV Unidirectional Discrete TVS



Pinout



Functional Block Diagram



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 μs surge current (IEC61000-4-5) with very low clamping voltages.

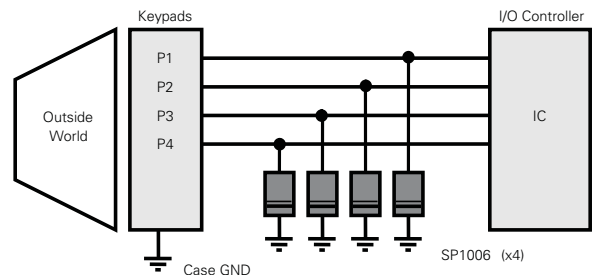
Features

- ESD, IEC61000-4-2, $\pm 30\text{kV}$ contact, $\pm 30\text{kV}$ air
- EFT, IEC61000-4-4, 40A (5/50ns)
- Lightning, IEC61000-4-5, 5A (8/20 μs)
- Low leakage current of 0.5 μA (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 85	°C
T_{STOR}	Storage Temperature	-60 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

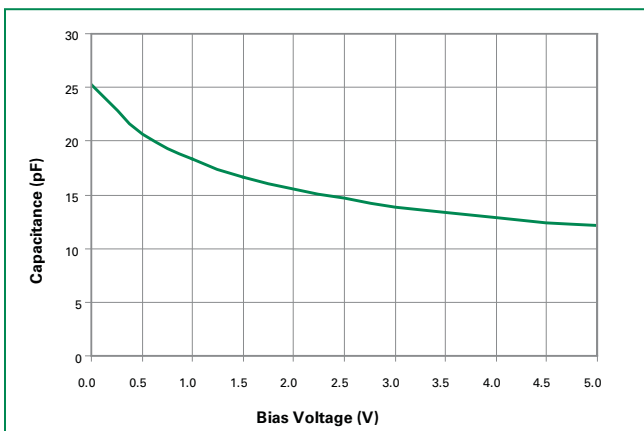
Parameter	Rating	Units
Storage Temperature Range	-65 to 150	°C
Maximum Junction Temperature	150	°C
Maximum Lead Temperature (Soldering 30s)	260	°C

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

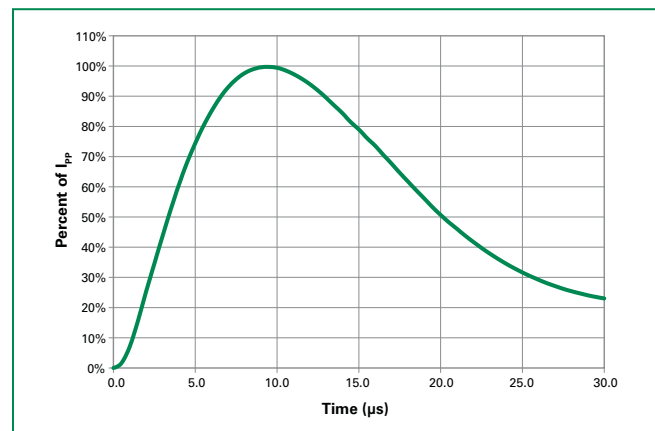
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}				6.0	V
Breakdown Voltage	V_{BR}	$I_R=1mA$ (Pin 1 to 2)		7.8		V
Forward Voltage Drop	V_F	$I_R=1mA$ (Pin 2 to 1)		0.8		V
Leakage Current	I_{LEAK}	$V_R=5V$		0.1	0.5	μA
Clamp Voltage ¹	V_C	$I_{PP}=1A, t_p=8/20\mu s$ (Pin 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		Ω
ESD Withstand Voltage ¹	V_{ESD}	IEC61000-4-2 (Contact Discharge)	± 30			kV
		IEC61000-4-2 (Air Discharge)	± 30			kV
Diode Capacitance ¹	C_D	Reverse Bias=0V		25		pF
		Reverse Bias=2.5V		15		pF

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

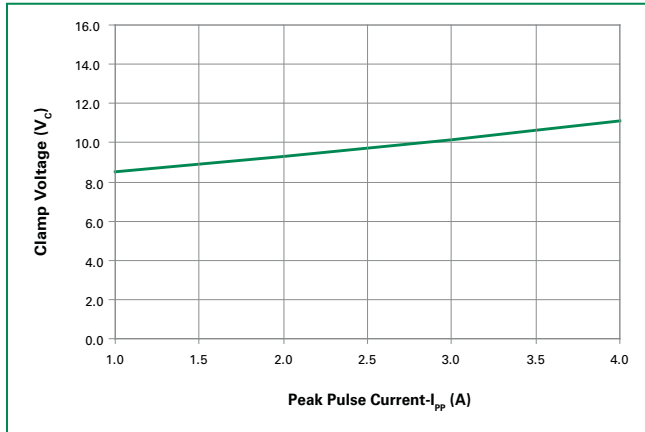
Capacitance vs. Reverse Bias



Pulse Waveform

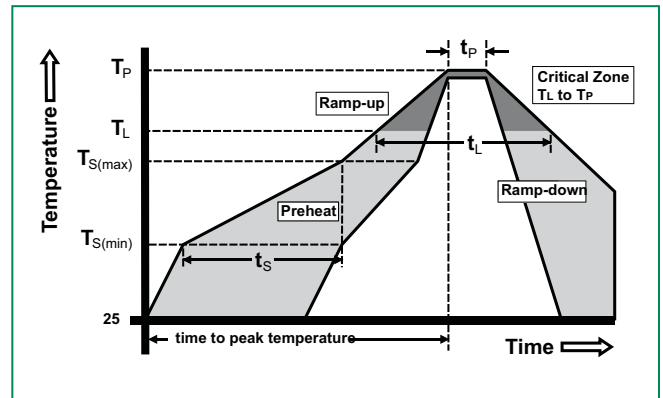


Clamping Voltage vs. I_{pp}

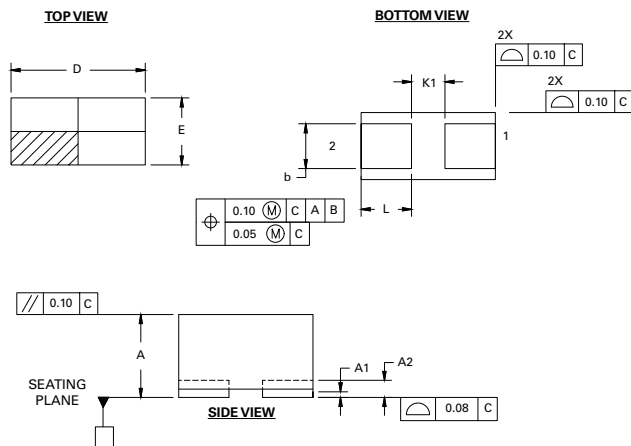


Soldering Parameters

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 ^{+0/-5} °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.	

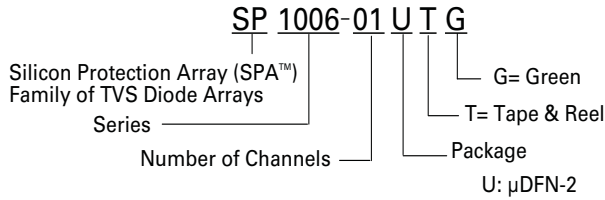


Package Dimensions – μ DFN-2 (0201)

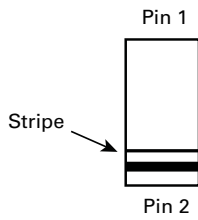


Package	μ DFN-2 (0201)			
JEDEC	MO-236			
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.34	0.40	0.014	0.016
A1	0.00	0.05	0.000	0.002
A2	0.075 REF		0.003 REF	
b	0.20 REF		0.008 REF	
D	0.55	0.65	0.022	0.026
E	0.25	0.35	0.010	0.014
L	0.175	0.275	0.007	0.011
K1	0.15 REF		0.006 REF	

Part Numbering System



Part Marking System



Ordering Information

Part Number	Package	Marking	Min. Order Qty.
SP1006-01UTG	μ DFN-2		10000

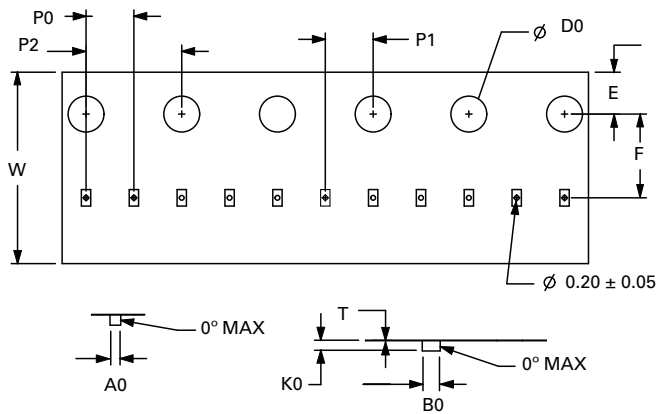
Product Characteristics

Lead Plating	Pre-Plated Frame
Lead Material	Copper Alloy
Lead Coplanarity	0.0004 inches (0.102mm)
Substitute Material	Silicon
Body Material	Molded Epoxy
Flammability	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.

Embossed Carrier Tape & Reel Specification – μ 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