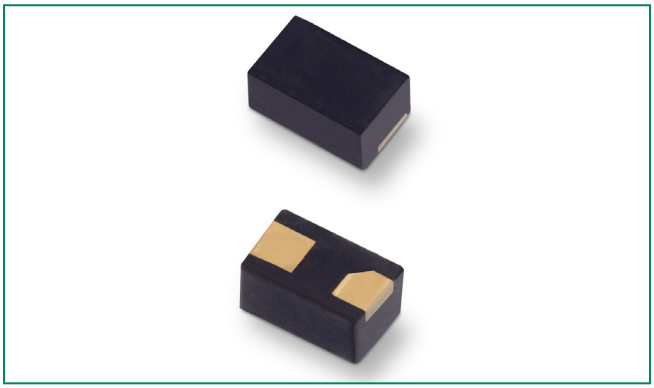
SP1054 25pF 30kV 01005 DFN Plastic Unidirectional Discrete TVS

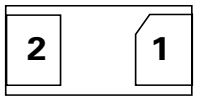
HF RoHS Pb GREEN



Description

Avalanche breakdown 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 ±30kV (contact discharge, IEC 61000-4-2) without performance degradation. Additionally, each diode can safely withstand 2.5A surge (8/20 waveshape as defined in IEC 61000-4-5 2nd edition) at a very low clamping voltage.

Pinout



Note: Drawing not to scale

Features

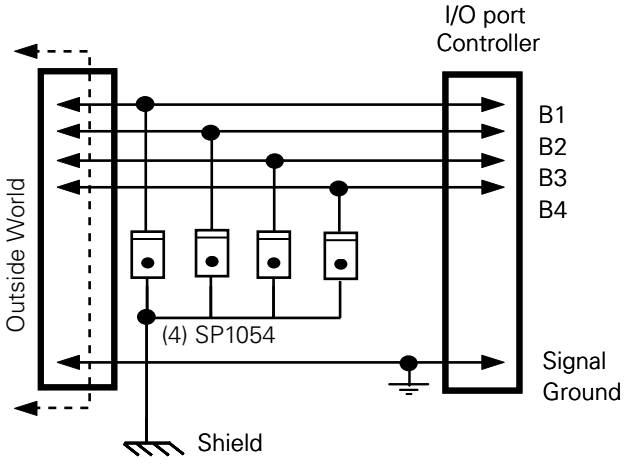
- ESD, IEC 61000-4-2, ±30kV contact, ±30kV air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, 2.5A (8/20 as defined in IEC 61000-4-5 2nd edition)
- Low capacitance of 25.5 pF (@ V_R=0V)
- Low leakage current of 0.02µA (TYP) at 5V
- Unidirectional solutions presents half the dynamic resistance of a bidirectional device protects fasten and better
- Industry's smallest ESD footprint available (01005 DFN plastic)
- Moisture Sensitivity Level(MSL -1)
- Halogen free, lead free and RoHS compliant
- AEC-Q101 qualified

Functional Block Diagram

Applications

- Mobile Phones
- Smart Phones
- Camcorders
- Portable Medical
- Digital Cameras
- Wearable Technology
- Portable Navigation Components
- Tablets
- Point of Sale Terminals
- Identification Modules

Application Example



Revision: 02/07/18

TVS Diode Arrays (SPA® Diodes)

General Purpose ESD Protection - SP1054

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current (t_p=8/20µs)	2.5 [1]	A
T_{OP}	Operating Temperature	-40 to 125	°C
T_{STOR}	Storage Temperature	-55 to 150	°C

Notes:

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

Electrical Characteristics (T_{OP}=25°C)

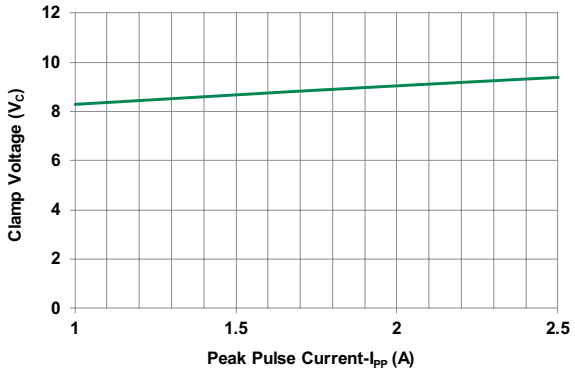
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}	I_R≤1µA			6.0	V
Breakdown Voltage	V_{BR}	I_R=1mA	6.5	7.2		V
Leakage Current	I_{LEAK}	V_R=5V with 1 pin at GND		0.02	0.5	µA
Clamp Voltage[1]	V_C	I_{PP}=1A, t_p=8/20µs, Fwd		8.5	11	V
		I_{PP}=2A, t_p=8/20µs, Fwd		9.5	13	V
Dynamic Resistance[2]	R_{DYN}	TLP, t_P=100ns, I/O to GND		0.21		Ω
ESD Withstand Voltage[1]	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	±30			kV
		IEC 61000-4-2 (Air Discharge)	±30			kV
Diode Capacitance[1]	C_D	Reverse Bias=0V		26		pF

Note:

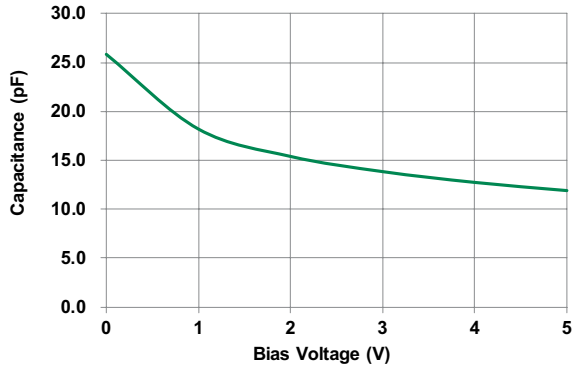
1 Parameter is guaranteed by design and/or component characterization.

2 Transmission Line Pulse (TLP) with 100ns width, 2ns rise time, and average window t1=70ns to t2= 90ns

Clamping voltage vs. I_{PP} for 8/20µs Waveshape



Capacitance vs. Bias



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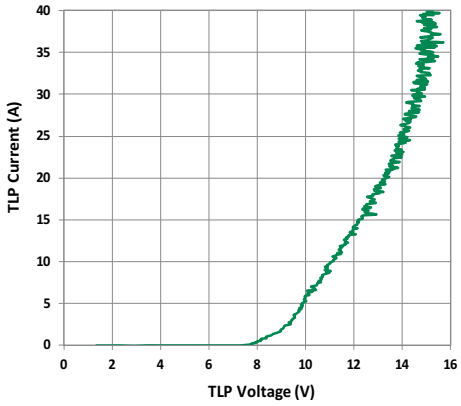
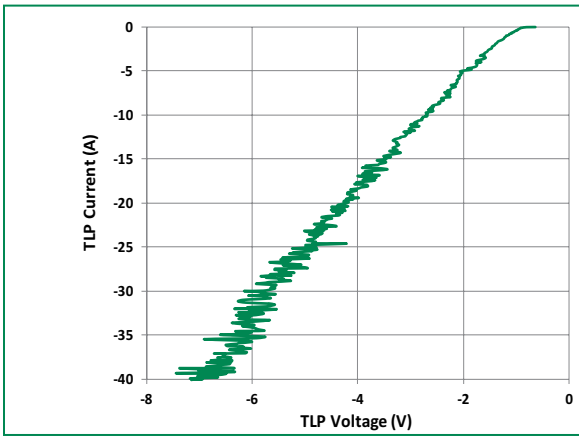
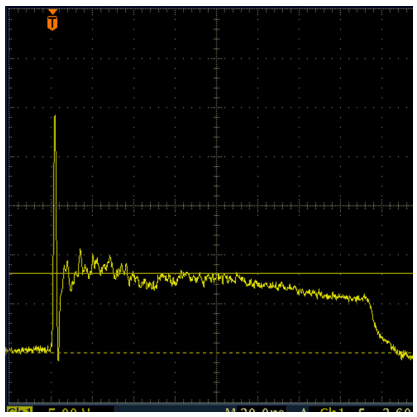
Positive Transmission Line Pulsing (TLP) Plot



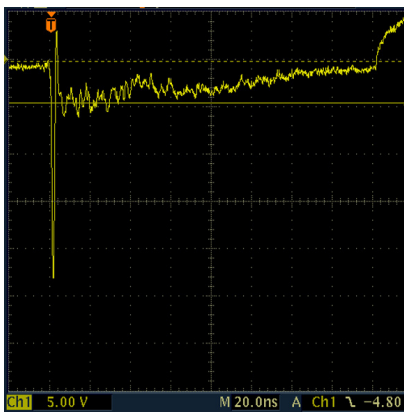
Negative Transmission Line Pulsing (TLP) Plot



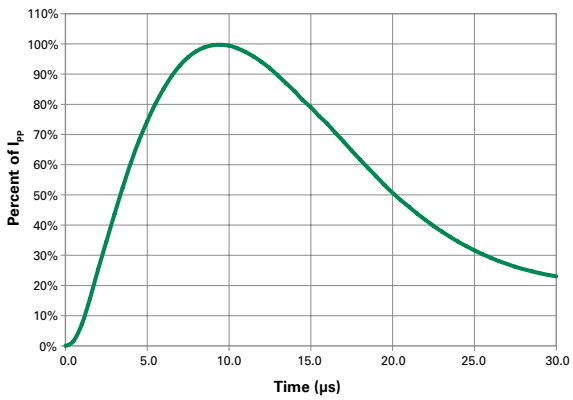
IEC 61000–4–2 +8 kV Contact ESD Clamping Voltage



IEC 61000–4–2 -8 kV Contact ESD Clamping Voltage



8/20µs Pulse Waveform



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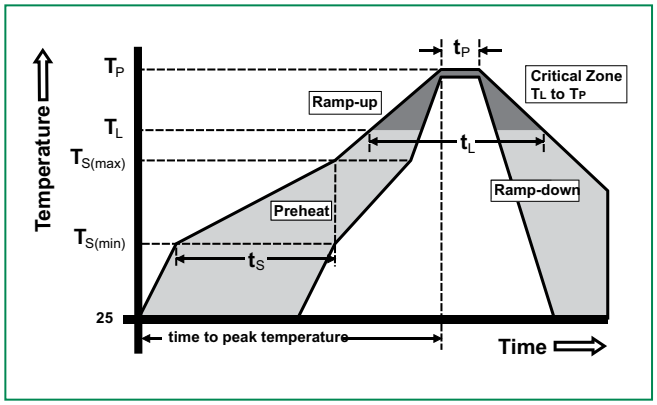
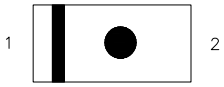
Soldering Parameters

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.
Do not exceed		260°C



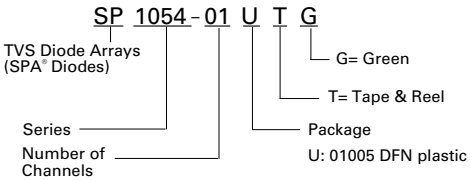
Part Marking System



Ordering Information

Part Number	Package	Min. Order Qty.
SP1054-01UTG	01005 DFN plastic	20000

Part Numbering System



Product Characteristics

Lead Plating	Pre-Plated Frame
Lead Material	Copper Alloy
Substrate material	Silicon
Body Material	Molded Compound
Flammability	UL Recognized compound meeting flammability rating V-0.

Notes :
1. All dimensions are in millimeters
2. Dimensions include solder plating.
3. Dimensions are exclusive of mold flash & metal burr.

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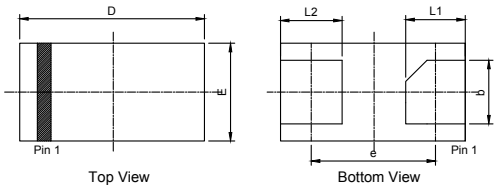
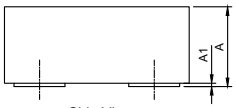
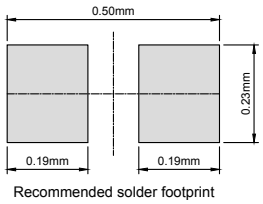
Package Dimensions — 01005 DFN

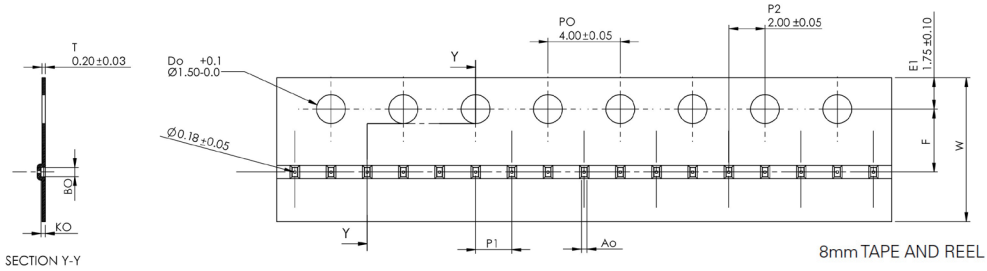






Symbol	01005 DFN plastic					
	Millimeters			Inches		
	Min	Typ	Max	Min	Typ	Max
A	0.235	0.250	0.265	0.0093	0.0098	0.0104
A1	-	0.015	0.020	-	0.0006	0.0008
b	0.100	0.150	0.200	0.0039	0.0059	0.0079
D	0.385	0.435	0.485	0.0152	0.0171	0.0191
E	0.200	0.250	0.300	0.0079	0.0098	0.0118
e		0.293			0.0115	
L1	0.090	0.140	0.190	0.0035	0.0055	0.0075
L2	0.095	0.145	0.195	0.0037	0.0057	0.0077

Embossed Carrier Tape & Reel Specification — 01005 DFN plastic



Symbol	Millimeters
A0	0.29 +0.02/-0.03
B0	0.505 +/-0.03
K0	0.275 +0.03/-0.10
F	3.5 +/- 0.05
P1	2.00+/-0.05
W	8.00+/-0.10