



# SPE0592

## Single-Line ESD Protection Array

### DESCRIPTION

The SPE0592 is a bi-direction TVS device that is to protect sensitive electronics from damage or latch-up due to ESD. They are designed for use in applications where board space is at a premium. SPE0592 will protect single line, and may be used on line where the signal polarities swing above and below ground.

SPE0592 offer desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

SPE0592 may be used to meet the immunity requirements of IEC 61000-4-2, level 4. The small DFN2 package makes them ideal for use in portable electronics such as cell phones, PDA's, notebook computers, and digital cameras.

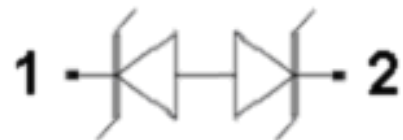
### APPLICATIONS

- ◆ Near Field Communications
- ◆ Cordless Phone
- ◆ RF Signal ESD Protection
- ◆ RF Switching, PA and Antenna ESD Protection
- ◆ USB2.0, USB3.0
- ◆ HDMI 1.2~2.1

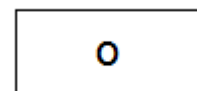
### FEATURES

- ◆ Transient protection for data lines to IEC 61000-4-2 (ESD)  $\pm 15\text{kV}$  (air),  $\pm 8\text{kV}$  (contact)  
IEC 61000-4-4 (EFT) 40A (5/50ns)
- ◆ Protects single I/O lines
- ◆ Working voltage: 5V
- ◆ Low leakage current
- ◆ Low operating and clamping voltages

### PIN CONFIGURATION ( DFN2 )



### PART MARKING





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### ORDERING INFORMATION

Part Number	Package	Part Marking
SPE0592BP02RGB	DFN2	O

※ SPE0592BP02RGB: Tape Reel ; Pb Free, Halogen Free

### ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Peak Pulse Power ( tp = 8/20 μs )	Ppk	60	W
Maximum Peak Pulse Current ( tp = 8/20 μs )	Ipp	4	A
ESD per IEC 61000 – 4 – 2 (Air )	Vpp	±15	KV
ESD per IEC 61000 – 4 – 2 (Contact )	Vpp	±8	KV
Operating Junction Temperature	TJ	-55 ~ 125	°C
Storage Temperature Range	TSTG	-55 ~ 150	°C
Lead Soldering Temperature	TL	260 ( 10sec )	°C

### ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Reverse Stand – Off Voltage	VRWM				5	V
Reverse Breakdown Voltage	VBR	It = 1mA	6			V
Reverse Leakage Current	IR	VRWM = 5V , T=25°C		0.01	1	μA
Reverse Leakage Current	IR	VRWM = 3V , T=25°C		0.01	0.5	μA
Clamping Voltage	VC	Ipp = 1A , tp = 8/20 μs			13	V
Clamping Voltage, TLP(Note 1)	VC	Ipp = 8A		24		V
Junction Capacitance	Cj	VR = 0V , f = 1MHz		0.3	0.35	pF
Dynamic Resistance	RDYN	TLP Pulse		1.8		Ω,

Notes:

1) TLP parameter: Zo = 50Ω, tp = 100ns, tr = 10ns, averaging window from 70ns to 90ns.



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### TYPICAL CHARACTERISTICS

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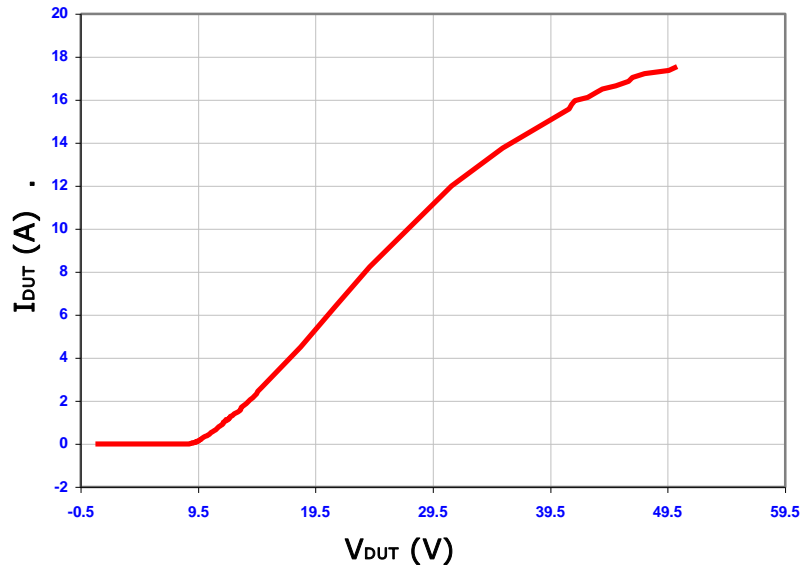


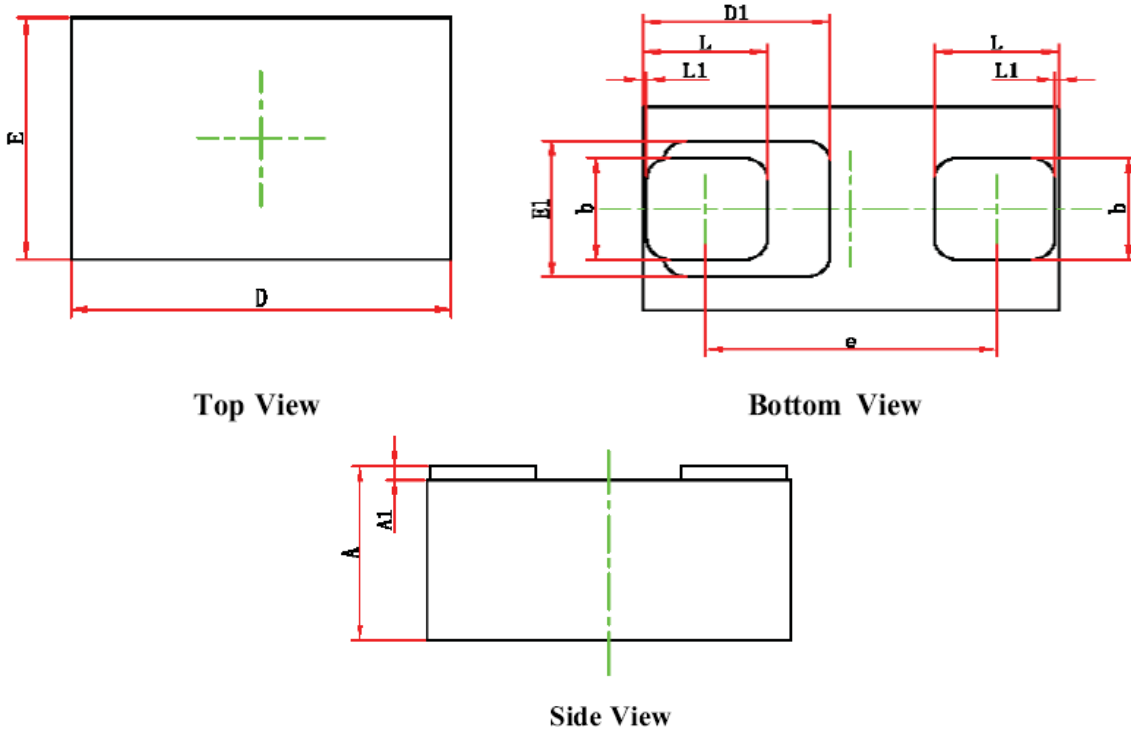
Fig. 1 Typical TLPIV Curve



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### DFN2 PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
A1	0.010	0.070	0.000	0.003
D	0.95	1.050	0.037	0.011
E	0.550	0.650	0.022	0.026
D1	0.450REF		0.018REF	
E1	0.400REF		0.016REF	
b	0.275	0.325		0.013
e	0.675	0.725		0.029
L	0.275	0.325		0.013
L1	0.010REF		0.000REF	



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