



# 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 DFN1.0x0.6-2L package makes them ideal for use in portable electronics such as cell phones, PDA's, notebook computers, and digital cameras.

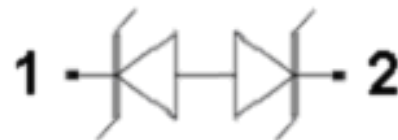
### APPLICATIONS

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

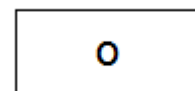
### FEATURES

- ◆ 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 (DFN1.0x0.6-2L)



### PART MARKING





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### ORDERING INFORMATION

| Part Number   | Package       | Part Marking |
|---------------|---------------|--------------|
| SPE0592DN2RGB | DFN1.0x0.6-2L | O            |

※ SPE0592DN2RGB: 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      |      | 0.04 | 0.5  | μA   |
| Reverse Leakage Current       | IR     | VRWM = 3.3V , T=25°C    |      | 0.03 | 0.2  | 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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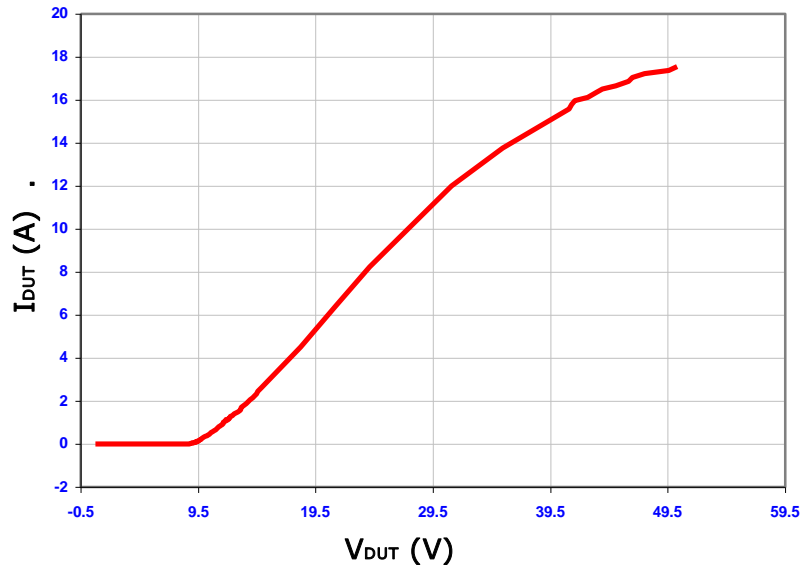
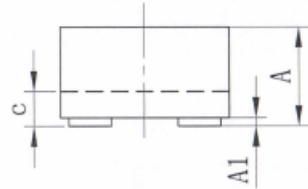
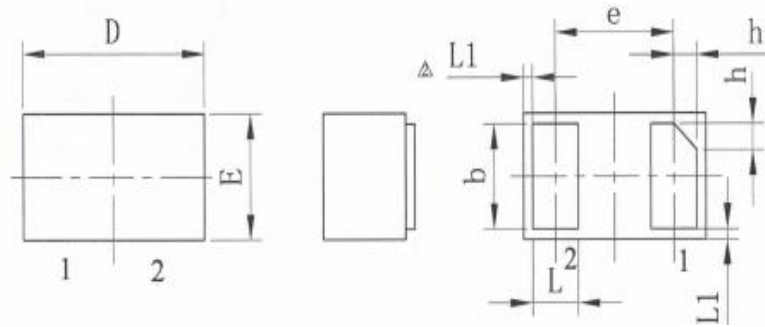


Fig. 1 Typical TLPIV Curve



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## DFN1.0x0.6-2L PACKAGE OUTLINE



| SYMBOL       | MILLIMETER |      |      |
|--------------|------------|------|------|
|              | MIN        | NOM  | MAX  |
| A            | 0.45       | 0.50 | 0.55 |
| A1           | 0          | 0.02 | 0.05 |
| b            | 0.45       | 0.50 | 0.55 |
| c            | 0.12       | 0.15 | 0.18 |
| D            | 0.95       | 1.00 | 1.05 |
| e            | 0.65BSC    |      |      |
| E            | 0.55       | 0.60 | 0.65 |
| L            | 0.20       | 0.25 | 0.30 |
| L1           | 0.05REF    |      |      |
| h            | 0.07       | 0.12 | 0.17 |
| 载体尺寸<br>(mm) | 20*20      |      |      |



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