



SPE0511

Single-Line ESD Protection Array

DESCRIPTION

The SPE0511 are designed by 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. SPE0511 will protect single line, and may be used on line where the signal polarities swing above and below ground.

SPE0511 offer desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

SPE0511 may be used to meet the immunity requirements of IEC 61000-4-2, level 4. The small SOD-523 package makes them ideal for use in portable electronics such as cell phones, PDA's, notebook computers, and digital cameras.

APPLICATIONS

- ◆ Cellular Handsets and Accessories
- ◆ Cordless Phone
- ◆ PDA
- ◆ Notebooks and Handhelds
- ◆ Portable Instrumentation
- ◆ Digital Cameras
- ◆ MP3 Player

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 (SOD-523)



PART MARKING





SPE0511

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ORDERING INFORMATION

| Part Number | Package | Part Marking |
|--------------|---------|--------------|
| SPE0511D52RG | SOD-523 | 1 |

※ SPE0511D52RG : Tape Reel ; Pb – Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

| Parameter | Symbol | Typical | Unit |
|---|--------|---------------|------|
| Peak Pulse Power (tp = 8/20 μs) | Ppk | 250 | W |
| Maximum Peak Pulse Current (tp = 8/20 μs) | Ipp | 7 | A |
| ESD per ICE 61000 – 4 – 2 (Air) | Vpp | ±15 | KV |
| ESD per ICE 61000 – 4 – 2 (Contact) | Vpp | ±8 | KV |
| Operating Junction Temperature | Tj | -55 ~ 150 | °C |
| Storage Temperature Range | TSTG | -55 ~ 150 | °C |
| Lead Soldering Temperature | TL | 260 (10sec) | °C |

ELECTRICAL CHARACTERISTICS

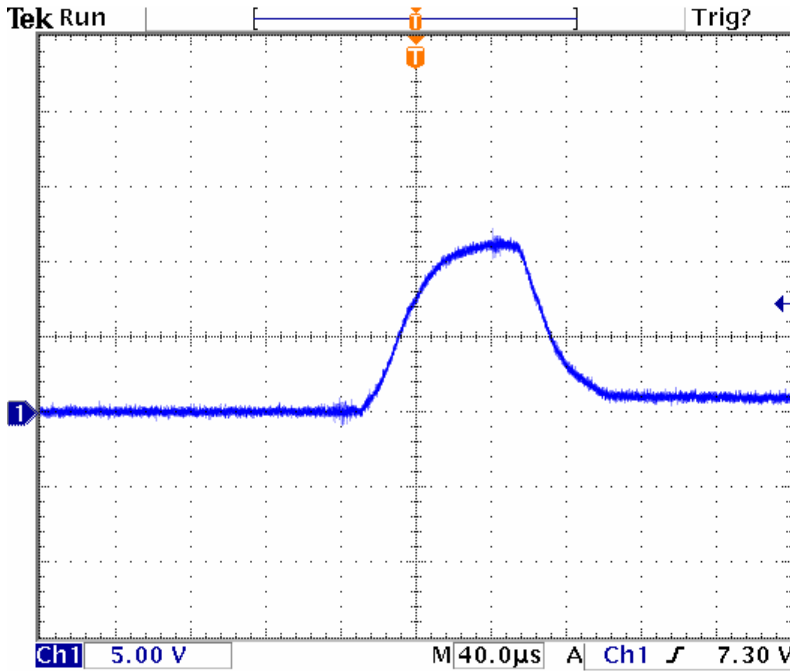
(TA=25°C Unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|-----------------------------|--------|---|------|------|------|------|
| Reverse Stand – Off Voltage | VRWM | | | | 5 | V |
| Reverse Breakdown Voltage | VBR | It = 1mA | 6 | | 8.5 | 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 | | | 11.5 | V |
| Clamping Voltage | Vc | Ipp = 7A , tp = 8/20 μs | | | 15 | V |
| Junction Capacitance | Cj | Between I/O Pin and GND VR = 0V , f = 1MHz | | 10 | 20 | pF |



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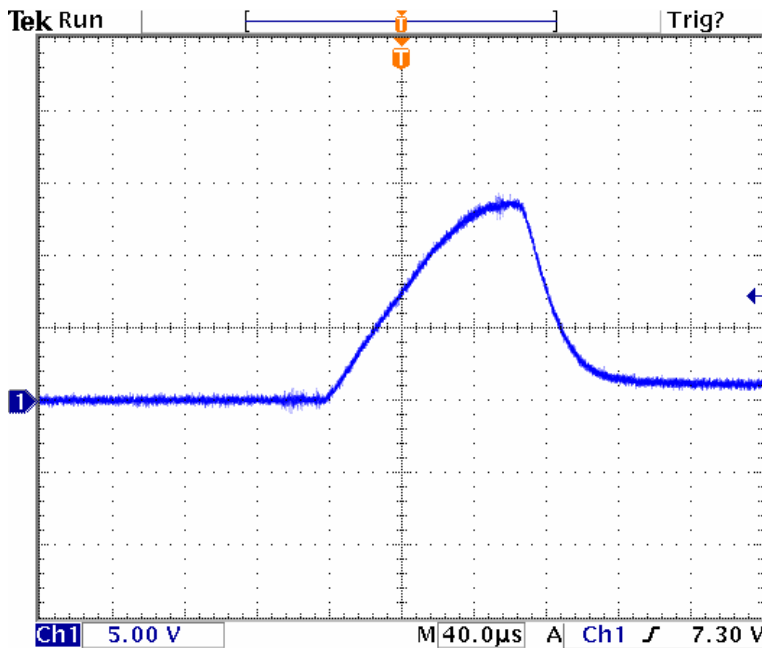
TYPICAL CHARACTERISTICS



-40.0000ns

Clamping Voltage ($I_{pp} = 1A$, $t_p = 8/20 \mu s$)

26 Oct 2005
12:15:46



-40.0000ns

Clamping Voltage ($I_{pp} = 7A$, $t_p = 8/20 \mu s$)

26 Oct 2005
12:08:20



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TYPICAL CHARACTERISTICS

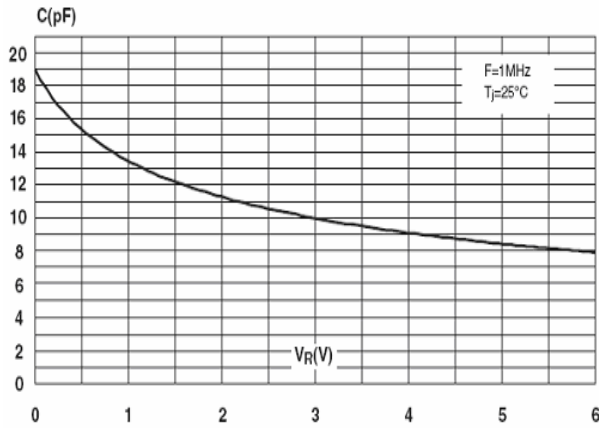


Fig 1 : Junction Capacitance V.S Reverse Voltage Applied

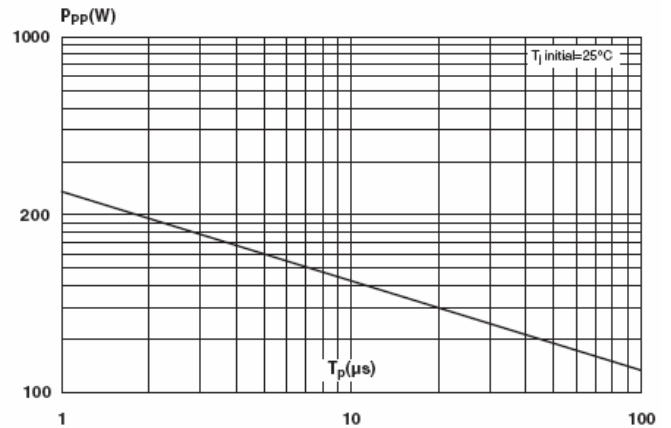


Fig 2 : Peak Plus Power V.S Exponential Plus Duration

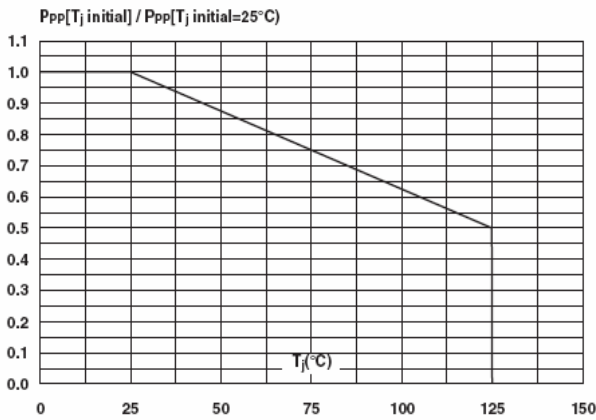


Fig 3 : Relative Variation of Peak Plus Power V.S Initial Junction Temperature

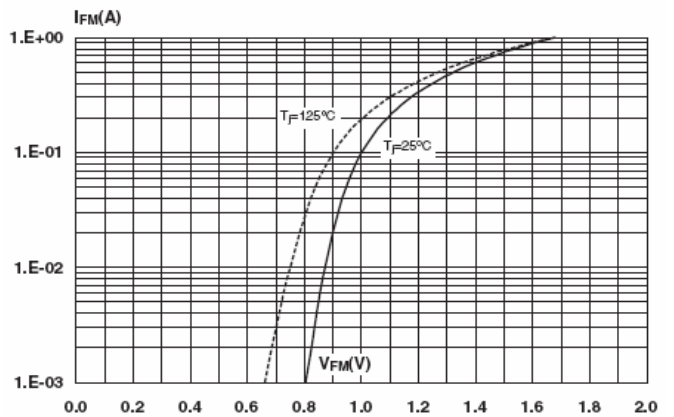


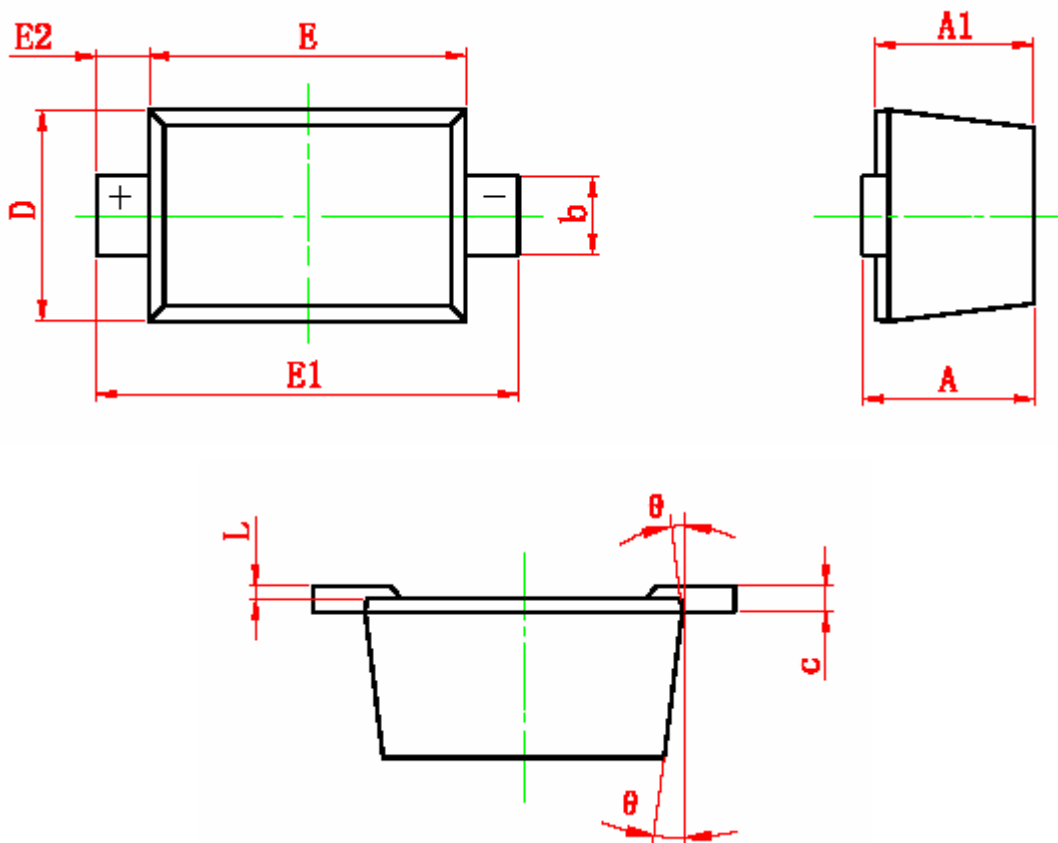
Fig 4 : Forward Voltage Drop V.S Peak Forward Current



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SOD-523 PACKAGE OUTLINE



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.510 | 0.770 | 0.020 | 0.031 |
| A1 | 0.500 | 0.700 | 0.020 | 0.028 |
| b | 0.250 | 0.350 | 0.010 | 0.014 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 0.750 | 0.850 | 0.030 | 0.033 |
| E | 1.100 | 1.300 | 0.043 | 0.051 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| E2 | 0.200 REF | | 0.008 REF | |
| L | 0.010 | 0.070 | 0.001 | 0.003 |
| θ | 7° REF | | 7° REF | |



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