

### SOT-23 Plastic-Encapsulate ESD Protection Diodes

## DESCRIPTION

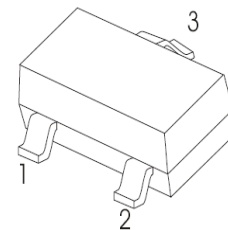
The SMxx Series is designed for applications requiring transient overvoltage protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment and other applications. These devices are ideal for situations where board space is at a premium.

This series has been specifically designed to protect sensitive components which are connected to power, data and transmission lines from overvoltage caused by ESD(electrostatic discharge), CDE (Cable Discharge Events),and EFT (electrical fast transients).

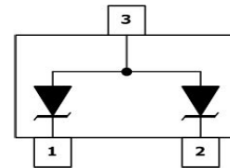
## Features

- ◆ 350 Watts Peak Pulse Power per (8/20μs)
- ◆ IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact)
- ◆ IEC61000-4-4 (EFT) 40A (5/50ns)
- ◆ Protects one bidirectional line or two unidirectional lines
- ◆ Low clamping voltage
- ◆ Low leakage current
- ◆ Working voltages : 3V, 5V, 8V, 12V, 15V, 18V, 20V, 24V, 36V
- ◆ Meets MSL 1 Requirements

## Pin Configuration



## Circuit Diagram



## Mechanical Characteristics

- ◆ Package: SOT-23
- ◆ Flammability Rating: UL 94V-0
- ◆ Terminal: Matte tin plated.
- ◆ High temperature soldering guaranteed: 260°C/10s
- ◆ Packaging: Tape and Reel

## Applications

- ◆ Cell Phone Handsets and Accessories
- ◆ Microprocessor based equipment
- ◆ Personal Digital Assistants (PDA's)
- ◆ Notebooks, Desktops, and Servers
- ◆ Portable Instrumentation
- ◆ Networking and Telecom
- ◆ Serial and Parallel Ports
- ◆ Peripherals

## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)

| Parameter                                              | Symbol           | Value        | Unit |
|--------------------------------------------------------|------------------|--------------|------|
| ESD per IEC 61000-4-2 (Air)                            | VESD             | ± 30         | KV   |
| ESD per IEC 61000-4-2 (Contact)                        |                  | ± 30         |      |
| Peak Pulse Power(tp=8/20us waveform)                   | PPP              | 350          | W    |
| Operating Temperature                                  | T <sub>OPT</sub> | -55 to +150  | °C   |
| Storage Temperature                                    | T <sub>STG</sub> | -55 to +150  | °C   |
| Lead Solder Temperature – Maximum (10 Second Duration) | T <sub>L</sub>   | 260(10 sec.) | °C   |

The above data are for reference only.



## SMxx Series

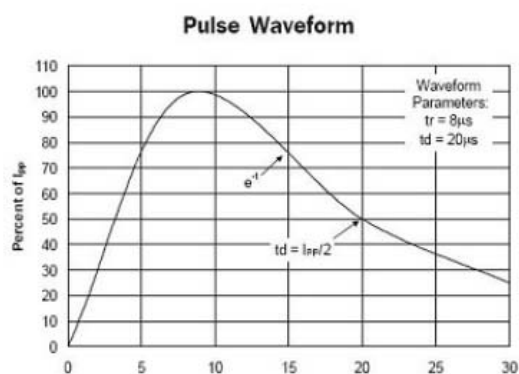
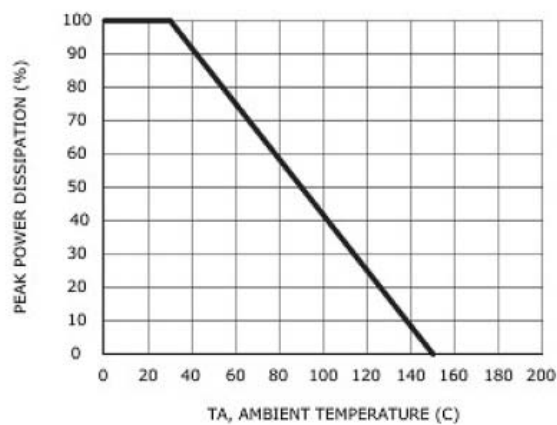
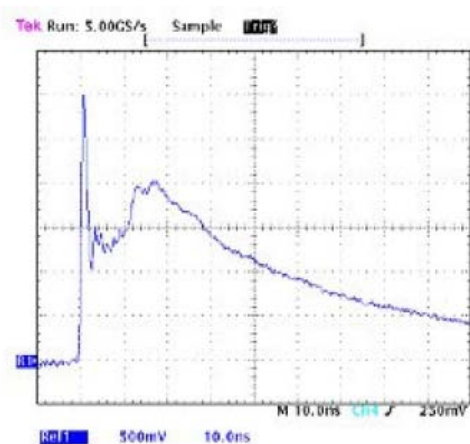
### UNI-directional TVS Diodes Array

#### Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

| PART<br>NUMBER | DEVICE<br>MARKING | V <sub>RWM</sub><br>(V)<br>(max.) | V <sub>B</sub><br>(V)<br>(min.) | I <sub>T</sub><br>(mA) | V <sub>C</sub> @1A<br>(V)<br>(max.) | V <sub>C</sub><br>(V)<br>(max.) (@A) |    | I <sub>R</sub><br>(μA)<br>(max.) | C <sub>T</sub><br>(pF)<br>(max.) |
|----------------|-------------------|-----------------------------------|---------------------------------|------------------------|-------------------------------------|--------------------------------------|----|----------------------------------|----------------------------------|
| SM03           | M03               | 3.3                               | 4                               | 1                      | 7.0                                 | 14                                   | 20 | 40                               | 450                              |
| SM05           | M05               | 5                                 | 6                               | 1                      | 9.8                                 | 18                                   | 17 | 10                               | 300                              |
| SM08           | M08               | 8                                 | 8.5                             | 1                      | 13.4                                | 24                                   | 15 | 2                                | 240                              |
| SM12           | M12               | 12                                | 13.3                            | 1                      | 19                                  | 32                                   | 11 | 1                                | 130                              |
| SM15           | M15               | 15                                | 16.7                            | 1                      | 24                                  | 38                                   | 10 | 1                                | 120                              |
| SM18           | M18               | 18                                | 20.0                            | 1                      | 29                                  | 45                                   | 9  | 1                                | 100                              |
| SM20           | M20               | 20                                | 22.3                            | 1                      | 35                                  | 50                                   | 8  | 1                                | 90                               |
| SM24           | M24               | 24                                | 26.7                            | 1                      | 43                                  | 52                                   | 7  | 1                                | 80                               |
| SM36           | M36               | 36                                | 40                              | 1                      | 60                                  | 75                                   | 5  | 1                                | 60                               |

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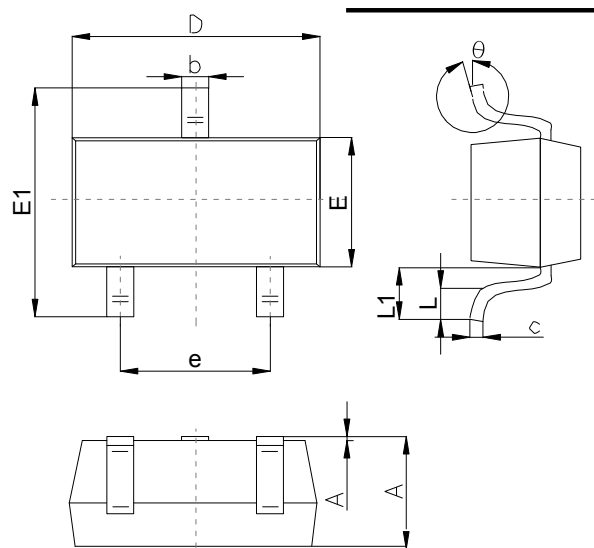
### ELECTRICAL CHARACTERISTICS CURVE



The curve above is for reference only .

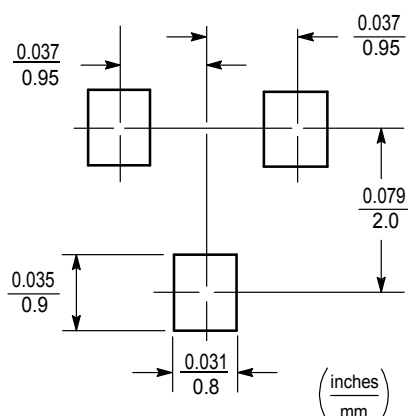
### Outlitne Drawing

#### SOT-23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |     |      |
|--------|---------------------------|-----|------|
|        | Min                       | Typ | Max  |
| A      | 0.65                      |     | 1.40 |
| A1     | 0.00                      |     | 0.20 |
| b      | 0.30                      |     | 0.55 |
| c      | 0.08                      |     | 0.20 |
| D      | 2.70                      |     | 3.10 |
| E      | 1.15                      |     | 1.65 |
| E1     | 2.10                      |     | 2.80 |
| e      | 1.70                      |     | 2.10 |
| L      | 0.15                      |     | 0.50 |
| L1     | 0.35                      |     | 0.70 |
| θ      | 0°                        |     | 12°  |

### Suggested Pad Layout

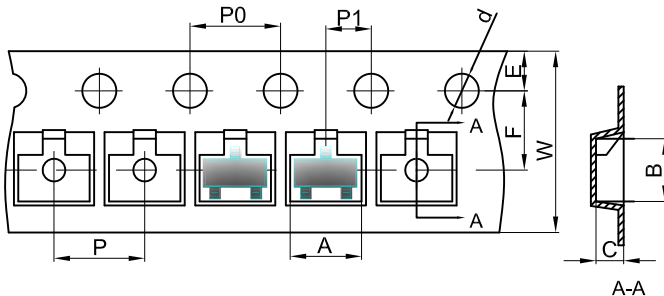


#### Note:

1. Controlling dimension:in/millimeters.
2. General tolerance: ±0.05mm.
3. The pad layout is for reference purposes only.

### SOT-23 Tape and Reel

#### SOT-23 Embossed Carrier Tape

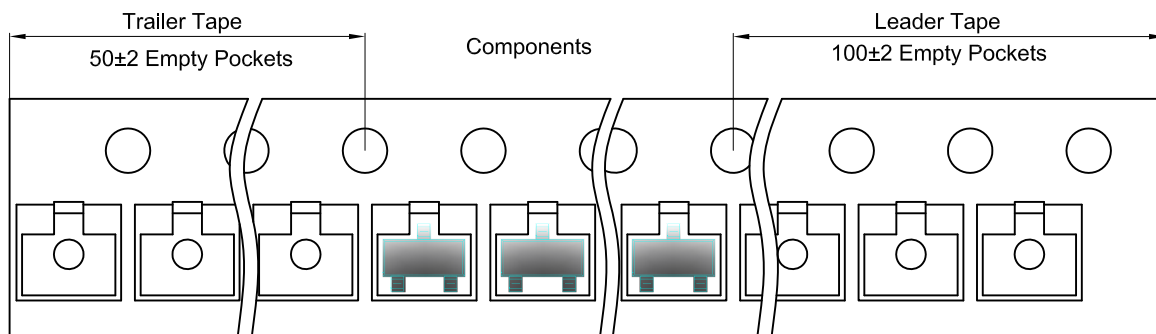


#### Packaging Description:

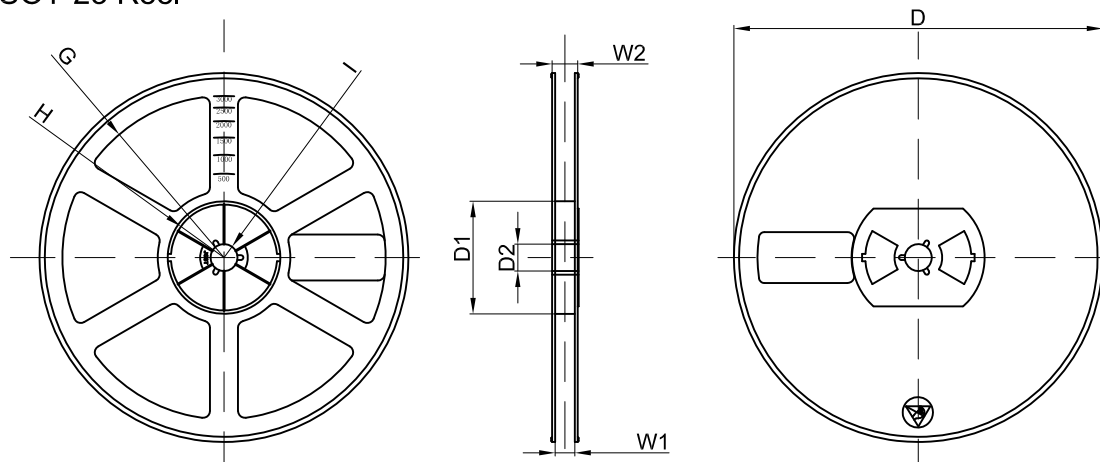
SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and are made of polystyrene plastic (anti-static coated).

| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |      |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| Pkg type                     | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W    |
| SOT-23                       | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

#### SOT-23 Tape Leader and Trailer



#### SOT-23 Reel



| Dimensions are in millimeter |         |       |       |        |        |       |      |       |
|------------------------------|---------|-------|-------|--------|--------|-------|------|-------|
| Reel Option                  | D       | D1    | D2    | G      | H      | I     | W1   | W2    |
| 7"Dia                        | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |

| REEL     | Reel Size | Box        | Box Size(mm) | Carton      | Carton Size(mm) | G.W.(kg) |
|----------|-----------|------------|--------------|-------------|-----------------|----------|
| 3000 pcs | 7 Inch    | 45,000 pcs | 203×203×195  | 180,000 pcs | 438×438×220     |          |

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