

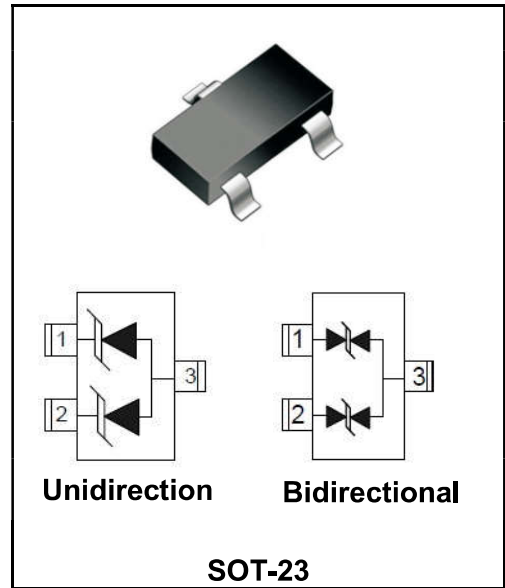
## Transient Voltage Suppressor

### Features

- ◆350 watts peak pulse power ( $t_p = 8/20\mu s$ )
- ◆Unidirectional & Bidirectional Configurations
- ◆Working Voltages: 3.3V, 5V, 8V, 12V, 15V, 24V and 36V
- ◆Low clamping voltages
- ◆Low Leakage Current
- ◆Response Time is Typically  $< 1$  ns
- ◆IEC 61000-4-2 ( ESD )  $\pm 30$ KV contact  $\pm 30$  KV Air
- ◆IEC 61000-4-4 (EFT) 40A (5/50ns)

### Application

- ◆RS-232, RS-422 & RS-485
- ◆Cellular Handsets & Accessories
- ◆Control & Monitoring Systems
- ◆Portable Electronics
- ◆Set-Top Box
- ◆Servers, Notebook, and Desktop PC
- ◆Wireless Bus Protection

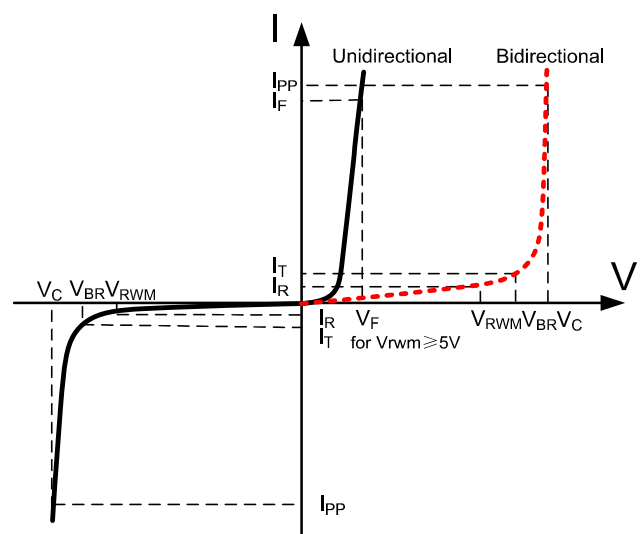


### Limiting Values(TA = 25 °C, unless otherwise specified)

| Symbol           | Parameter                              | Conditions | value       | Unit |
|------------------|--|------------|-------------|------|
| P <sub>PP</sub>  | Peak Pulse Power ( $t_p = 8/20\mu s$ ) | Contact    | 350         | W    |
| TL               | Lead Soldering Temperature             | -          | 260(10sec)  | °C   |
| T <sub>J</sub>   | Operating Temperature                  | -          | -55 to +125 | °C   |
| T <sub>stg</sub> | Storage Temperature                    | -          | -55 to +150 | °C   |

### Electrical Parameters (T=25°C)

| Symbol           | Parameter                                  |
|------------------|--|
| I <sub>PP</sub>  | Maximum Peak Pulse Current                 |
| V <sub>C</sub>   | Clamping Voltage @ I <sub>PP</sub>         |
| V <sub>RWM</sub> | Reverse Stand-Off Voltage                  |
| I <sub>R</sub>   | Reverse Leakage Current @ V <sub>RWM</sub> |
| V <sub>BR</sub>  | Breakdown Voltage @ I <sub>T</sub>         |
| I <sub>T</sub>   | Test Current                               |
| I <sub>F</sub>   | Forward Current                            |
| V <sub>F</sub>   | Forward Voltage @ I <sub>F</sub>           |

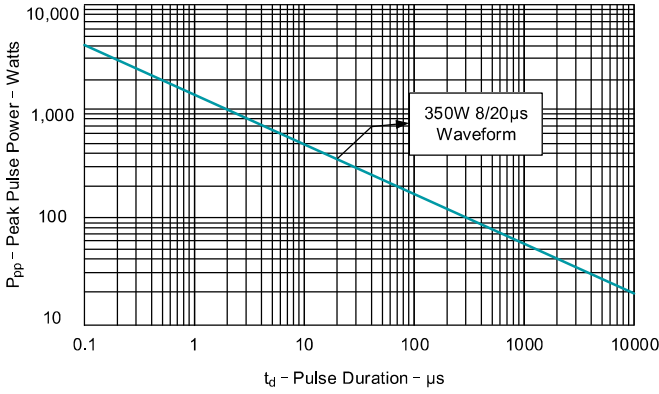


## Electrical Characteristics

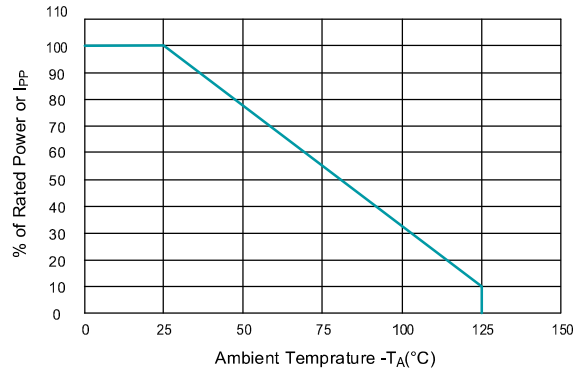
| Part Number  | Reverse Stand off Voltage $V_{RWM}$ (Volts) | Minimum Breakdown Voltage $V_{BR@1mA}$ (Volts) | Maximum Peak Pulse Current $I_{pp}$ (Amps) | Maximum Clamping Voltage $V_C@I_{PP}$ (Volts) | Maximum Reverse Leakage $I_R@V_{RWM}$ ( $\mu A$ ) | Typical Capacitance DC=0V $C_J@1\text{ MHz}$ (pF) | Maximum Capacitance DC=0V $C_J@1\text{ MHz}$ (pF) | Marking Code |
|--------------|---|--|--|---|---|---|---|--------------|
| ESD3V3FT233  | 3.3   | 4.0  | 25   | 15  | 1   | 200   | 240   | 3M2          |
| ESD3V3FBT233 | 3.3   | 4.0  | 25   | 15  | 1   | 100   | 120   | 3B2          |
| ESD5VFT233   | 5   | 6.0  | 25   | 16  | 1   | 150   | 180   | 5M2          |
| ESD5VFBT233  | 5   | 6.0  | 25   | 16  | 1   | 75  | 90  | 5B2          |
| ESD8VFT233   | 8   | 9.0  | 20   | 20  | 1   | 70  | 80  | 8M2          |
| ESD8VFBT233  | 8   | 9.0  | 20   | 20  | 1   | 40  | 45  | 8B2          |
| ESD12VFT233  | 12  | 13.3   | 15   | 24  | 1   | 75  | 90  | AM2          |
| ESD12VFBT233 | 12  | 13.3   | 15   | 24  | 1   | 40  | 90  | AB2          |
| ESD15VFT233  | 15  | 16.7   | 12   | 32  | 1   | 45  | 80  | BM2          |
| ESD15VFBT233 | 15  | 16.7   | 12   | 32  | 1   | 25  | 80  | BB2          |
| ESD18VFT233  | 18  | 19.0   | 10   | 34  | 1   | 30  | 70  | EM2          |
| ESD18VFBT233 | 18  | 19.0   | 10   | 34  | 1   | 30  | 70  | EB2          |
| ESD20VFT233  | 20  | 23.5   | 8  | 33  | 1   | 30  | 60  | FM2          |
| ESD20VFBT233 | 20  | 23.5   | 8  | 33  | 1   | 30  | 60  | FB2          |
| ESD24VFT233  | 24  | 26.7   | 7  | 42  | 1   | 25  | 50  | CM2          |
| ESD24VFBT233 | 24  | 26.7   | 7  | 42  | 1   | 25  | 50  | CB2          |
| ESD36VFT233  | 36  | 40   | 6  | 60  | 1   | 15  | 30  | DM2          |
| ESD36VFBT233 | 36  | 40   | 6  | 60  | 1   | 15  | 30  | DB2          |

Typical Characteristics

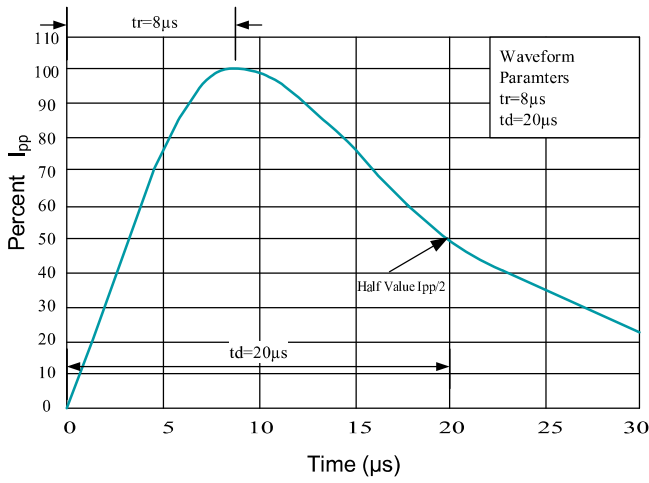
Peak Pulse Power vs. Pulse Time



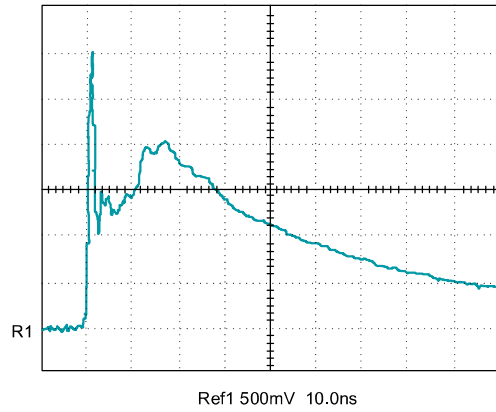
Power Derating Curve

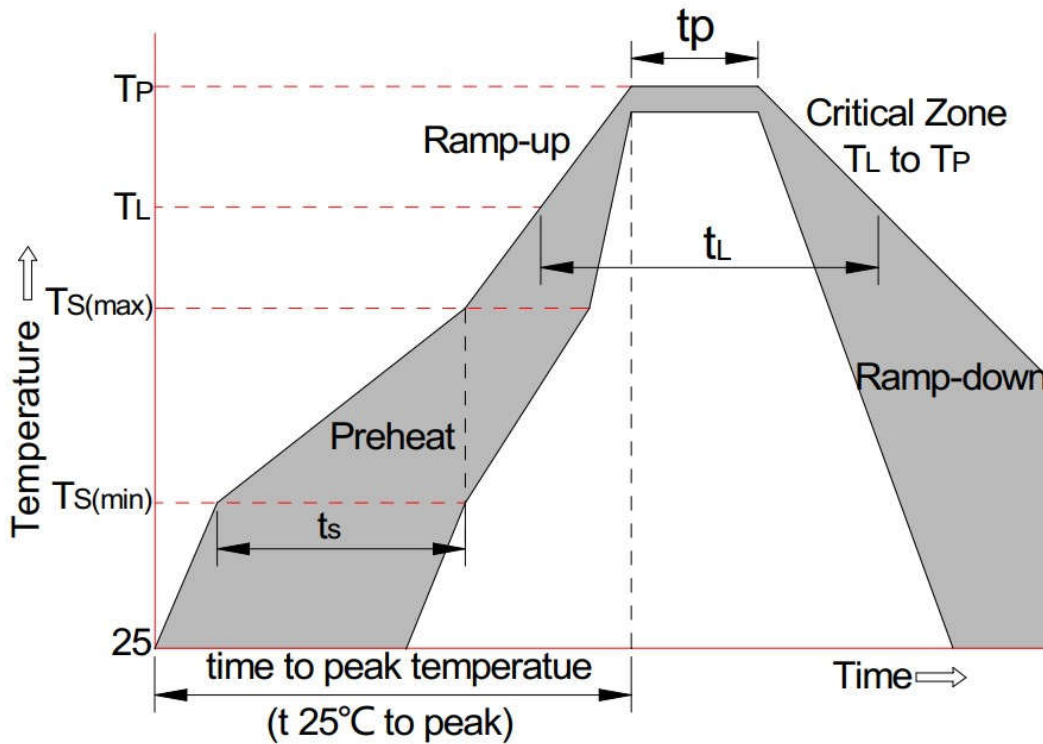


Pulse Waveform



ESD Pulse Waveform (Per IEC 61000-4-2)





| Reflow Condition                                   |                             | Pb-Free Assembly |
|--|-----------------------------|------------------|
| Pre-heat   | -Temperature Min (Ts(min))  | +150°C           |
|  | -Temperature Max(Ts(max))   | +200°C           |
|  | -Time (Min to Max) (ts)     | 60-190 secs.     |
| Average ramp up rate (Liquid us Temp (TL) to peak) |                             | 5°C/sec. Max     |
| Ts(max) to TL - Ramp-up Rate                       |                             | 5°C/sec. Max     |
| Reflow   | -Temperature(TL)(Liquid us) | +217°C           |
|  | -Temperature(tL)            | 60-150 secs.     |
| Peak Temp (Tp)                                     |                             | +260(+0/-5)°C    |
| Time within 5°C of actual Peak Temp (tp)           |                             | 20-40 secs. Max  |
| Ramp-down Rate                                     |                             | 5°C/sec. Max     |
| Time 25°C to Peak Temp (TP)                        |                             | 8 min. Max       |
| Do not exceed                                      |                             | +280°C           |

Ordering information

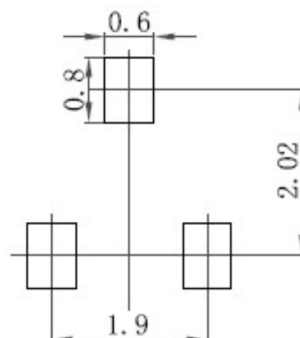
| Package | Packing Description | Base Quantity | Packing Quantity              |
|---------|---------------------|---------------|-------------------------------|
| SOT-23  | Tape/Reel,7"reel    | 3000pcs/Reel  | 24000PCS/Box 120000PCS/Carton |

Package Dimensions

SOT-23

| Dim. | Millimeter (mm) |      | mil  |      |
|------|-----------------|------|------|------|
|      | Min.            | Max. | Min. | Max. |
| A    | 0.9             | 1.15 | 35   | 45   |
| A1   | 0.1             |      | 3.9  |      |
| bp   | 0.38            | 0.48 | 15   | 19   |
| C    | 0.09            | 0.15 | 3.54 | 5.9  |
| D    | 2.8             | 3.0  | 110  | 118  |
| E    | 1.2             | 1.4  | 47   | 55   |
| E    | 1.9             |      | 75   |      |
| E1   | 0.95            |      | 37   |      |
| HE   | 2.1             | 2.55 | 83   | 100  |
| Lp   | 0.15            | 0.45 | 5.9  | 18   |
| Q    | 0.45            | 0.55 | 18   | 22   |
| v    | 0.2             |      | 7.9  |      |
| W    | 0.1             |      | 4    |      |

The recommended mounting pad size



## Disclaimer

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