

## Features

- 420W peak pulse power (8/20 $\mu$ s)
- Protects two bi-directional lines
- Ultra low leakage: nA level
- Operating voltage: 24V
- Low clamping voltage
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30$ kV
    - Contact discharge:  $\pm 30$ kV
  - IEC61000-4-4 (EFT) 40A (5/50ns)
  - IEC61000-4-5 (Lightning) 9A (8/20 $\mu$ s)
- RoHS Compliant

## Mechanical Data

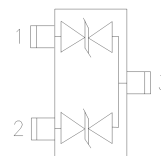
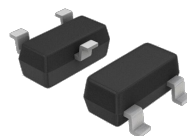
- SOT-23 package
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

## Applications

- Cellular Handsets and Accessories
- Notebooks and Handhelds
- Portable Instrumentation
- Set Top Box
- Industrial Controls
- Server and Desktop PC
- CAN BUS PROTECTION

V7T

SOT-23



Schematic

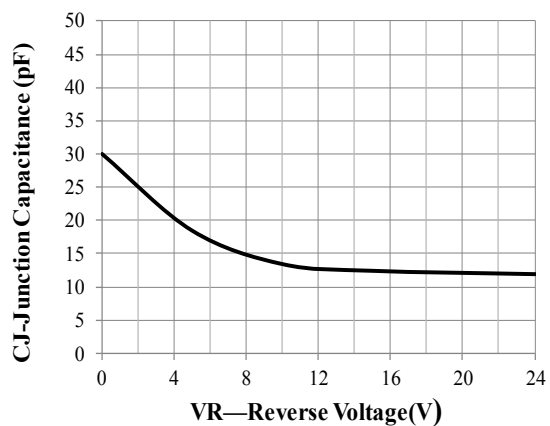
## Absolute Maximum Rating

| Parameter                         | Symbol | Value       | Unit         |
|-----------------------------------|--------|-------------|--------------|
| Peak Pulse Power (8/20 $\mu$ s)   | Ppk    | 420         | W            |
| Peak Pulse Current (8/20 $\mu$ s) | IPP    | 9           | A            |
| ESD per IEC 61000-4-2 (Air)       | VESD   | $\pm 30$    | kV           |
| ESD per IEC 61000-4-2 (Contact)   |        | $\pm 30$    |              |
| Operating Temperature Range       | TJ     | -55 to +125 | $^{\circ}$ C |
| Storage Temperature Range         | Tstg   | -55 to +150 | $^{\circ}$ C |

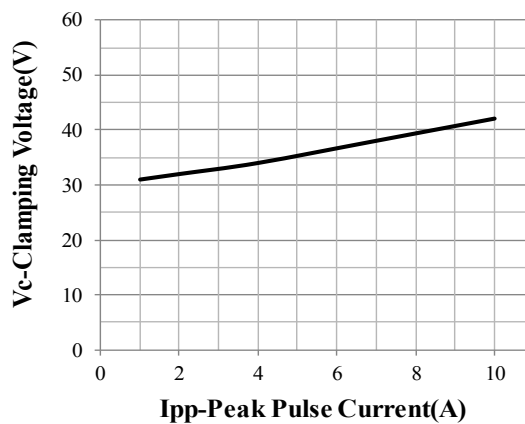
**Electrical Characteristics** (TA=25°C unless otherwise specified)

| Parameter               | Symbol    | Test Condition                                    | Min | Typ  | Max  | Unit          |
|-------------------------|-----------|---------------------------------------------------|-----|------|------|---------------|
| Reverse Working Voltage | $V_{RWM}$ |                                                   |     |      | 24   | V             |
| Breakdown Voltage       | $V_{BR}$  | $I_T = 1\text{mA}$                                | 26  | 28.5 | 30.5 | V             |
| Reverse Leakage Current | $I_R$     | $V_{RWM} = 24\text{V}$                            |     |      | 0.5  | $\mu\text{A}$ |
| Clamping Voltage        | $V_C$     | $I_{PP} = 1\text{A}$ (8 x 20 $\mu\text{s}$ pulse) |     | 35   | 40   | V             |
| Clamping Voltage        | $V_C$     | $I_{PP} = 9\text{A}$ (8 x 20 $\mu\text{s}$ pulse) |     | 45   | 58   | V             |
| Junction Capacitance    | $C_J$     | $V_R = 0\text{V}$ , $f = 1\text{MHz}$             |     | 30   | 50   | pF            |

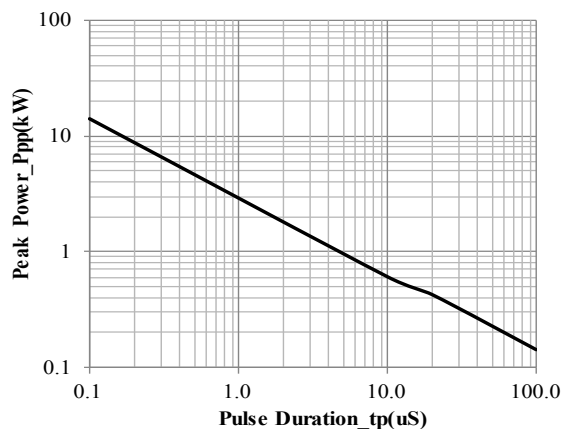
## RATING AND CHARACTERISTIC CURVES



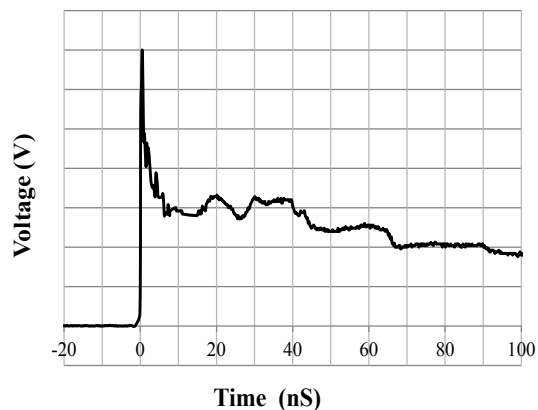
Junction Capacitance vs. Reverse Voltage



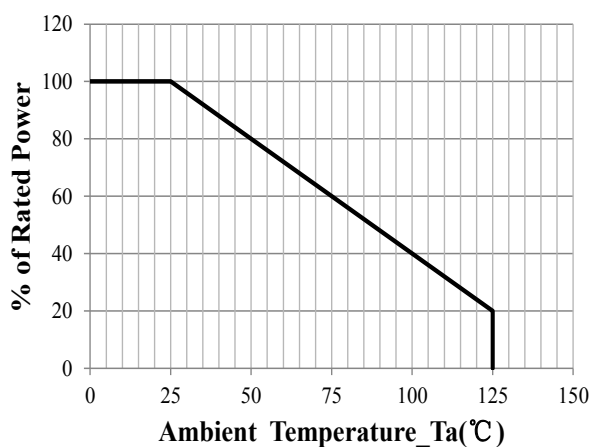
Clamping Voltage vs. Peak Pulse Current



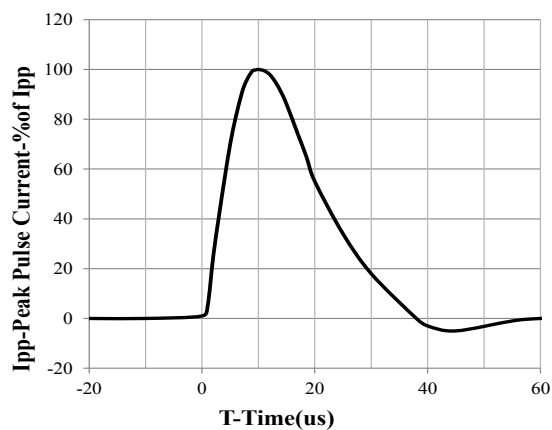
Peak Pulse Power vs. Pulse Time



IEC61000-4-2 Pulse Waveform



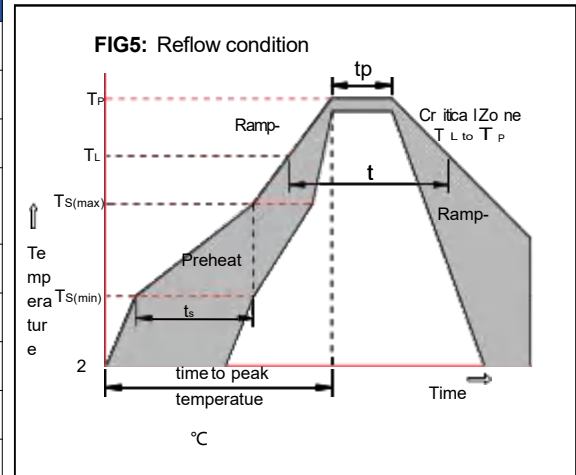
Power Derating Curve



8 X 20us Pulse Waveform

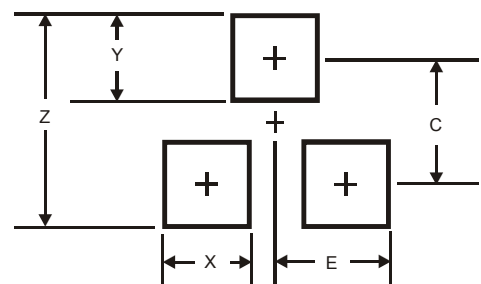
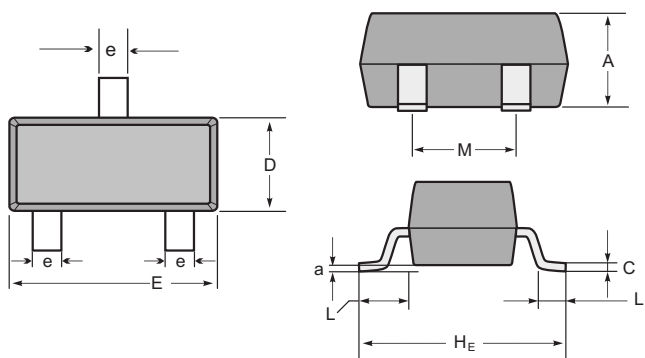
## Soldering parameters

| Reflow Condition                                        |                                   | Pb-Free assembly<br>(see as below) |
|---------------------------------------------------------|-----------------------------------|------------------------------------|
| Pre Heat                                                | -Temperature Min ( $T_{s(min)}$ ) | +150 °C                            |
|                                                         | -Temperature Max( $T_{s(max)}$ )  | +200 °C                            |
|                                                         | -Time (Min to Max) (ts)           | 60-180 secs.                       |
| Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak) |                                   | 3 °C/sec. Max                      |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                    |                                   | 3 °C/sec. Max                      |
| Reflow                                                  | -Temperature( $T_L$ )(Liquid us)  | +217 °C                            |
|                                                         | -Temperature( $t_L$ )             | 60-150 secs.                       |
| Peak Temp ( $T_P$ )                                     |                                   | +260(+0/-5) °C                     |
| Time within 5 °C of actual Peak Temp ( $t_P$ )          |                                   | 30 secs. Max                       |
| Ramp-down Rate                                          |                                   | 6 °C/sec. Max                      |
| Time 25 °C to Peak Temp ( $T_P$ )                       |                                   | 8 min. Max                         |
| Do not exceed                                           |                                   | +260 °C                            |



## Package Dimensions & Suggested Pad Layout

### SOT23

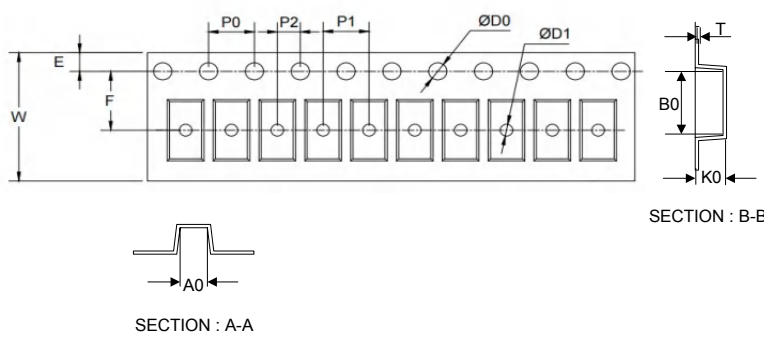
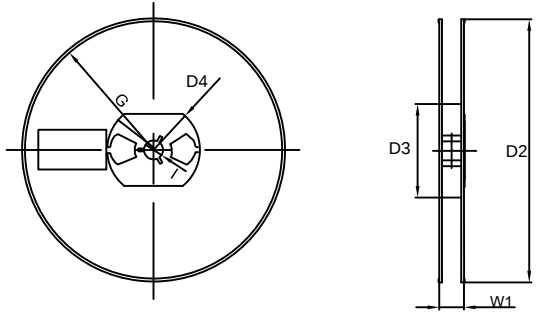


### SOT-23 mechanical data

| UNIT |     | A   | C    | D   | E   | H <sub>E</sub> | e   | M    | L          | L <sub>1</sub> | a    |
|------|-----|-----|------|-----|-----|----------------|-----|------|------------|----------------|------|
| mm   | max | 1.1 | 0.15 | 1.4 | 3.0 | 2.6            | 0.5 | 1.95 | 0.55 (ref) | 0.36 (ref)     | 0.15 |
|      | min | 0.9 | 0.08 | 1.2 | 2.8 | 2.2            | 0.3 | 1.7  |            |                | 0.0  |
| mil  | max | 43  | 6    | 55  | 118 | 102            | 20  | 77   | 22 (ref)   | 14 (ref)       | 6    |
|      | min | 35  | 3    | 47  | 110 | 87             | 12  | 67   |            |                | 0.0  |

| Dimensions | SOT23 |
|------------|-------|
| Z          | 2.9   |
| X          | 0.8   |
| Y          | 0.9   |
| C          | 2.0   |
| E          | 1.35  |

## Tape & reel specification

| Tape                                                                                |  | Symbol            | Dimension (mm) |
|-------------------------------------------------------------------------------------|--|-------------------|----------------|
|    |  | P0                | 4.00±0.10      |
|                                                                                     |  | P1                | 4.00±0.10      |
|                                                                                     |  | P2                | 2.00±0.10      |
|                                                                                     |  | D0                | 1.55±0.10      |
|                                                                                     |  | D1                | 1.05±0.10      |
|                                                                                     |  | E                 | 1.55±0.10      |
|                                                                                     |  | F                 | 3.60±0.10      |
|                                                                                     |  | W                 | 8.00±0.10      |
|                                                                                     |  | A0                | 3.80±0.20      |
|                                                                                     |  | B0                | 3.25±0.20      |
|                                                                                     |  | K0                | 1.45±0.10      |
|                                                                                     |  | T                 | 0.25±0.05      |
|                                                                                     |  | D2                | 178.0±3.0      |
|                                                                                     |  | D3                | 55Min.         |
|                                                                                     |  | D4                | R24.0±3.0      |
| 7" Reel                                                                             |  | G                 | R82.0±3.0      |
|  |  | I                 | 13.0±2.0       |
|                                                                                     |  | W1                | 11.0±3.0       |
|                                                                                     |  | Quantity: 3000PCS |                |