

## Features

200 Watts peak pulse power ( $t_p = 8/20\mu s$ )  
Unidirectional and unidirectional configurations  
Solid-state silicon-avalanche technology  
Low clamping voltage  
Low leakage current  
IEC 61000-4  $\pm 20kV_{contact}$   $\pm 20kV_{air}$   
IEC 61000-4-4 (EFT) 40A (5/50ns)  
IEC 61000-4-5 (Lightning) 10A (8/20 $\mu s$ )

## Mechanical Data

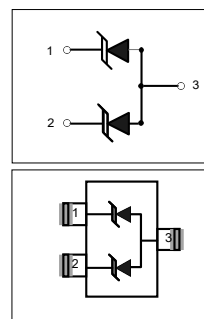
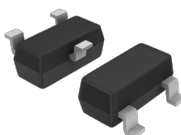
SOT-23 package  
Molding compound flammability rating: UL 94V-0  
Packaging: Tape and Reel  
RoHS/WEEE Compliant

## Applications

Dataline  
Automatic Teller Machines  
Net works  
Power line

EL61

SOT-23



Schematic & PIN Configuration

## Absolute Maximum Rating

| Rating                                                         | Symbol    | Value          | Units       |
|----------------------------------------------------------------|-----------|----------------|-------------|
| Peak Pulse Power ( $t_p = 8/20\mu s$ )                         | $P_{PP}$  | 200            | Watts       |
| Peak Pulse Current ( $t_p = 8/20\mu s$ ) (note1)               | $I_{PP}$  | 10             | A           |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | $V_{ESD}$ | 20<br>20       | kV          |
| Lead Soldering Temperature                                     | $T_L$     | 260(10seconds) | $^{\circ}C$ |
| Junction Temperature                                           | $T_J$     | -55 to + 125   | $^{\circ}C$ |
| Storage Temperature                                            | $T_{stg}$ | -55 to + 125   | $^{\circ}C$ |

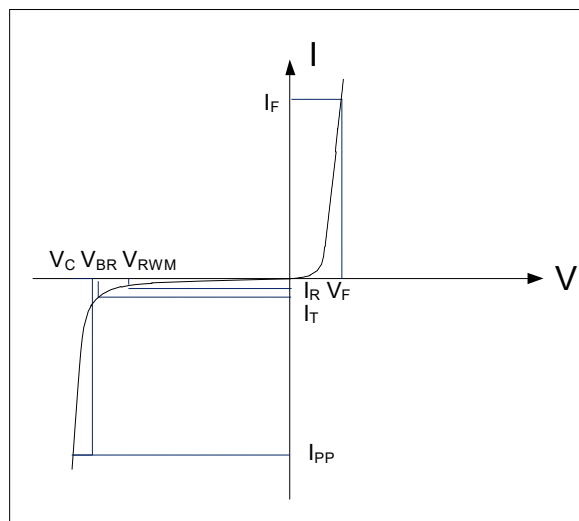
## Electrical Characteristics (TA=25°C unless otherwise specified)

| Parameter                 | Symbol    | Conditions                         | Min | Typical | Max | Units   |
|---------------------------|-----------|------------------------------------|-----|---------|-----|---------|
| Reverse Stand-Off Voltage | $V_{RWM}$ |                                    |     |         | 5.2 | V       |
| Reverse Breakdown Voltage | $V_{BR}$  | $I_T=1mA$                          | 6.1 |         |     | V       |
| Reverse Leakage Current   | $I_R$     | $V_{RWM}=5V, T=25^\circ C$         |     |         | 1   | $\mu A$ |
| Peak Pulse Current        | $I_{PP}$  | $t_p=8/20\mu s$                    |     |         | 10  | A       |
| Clamping Voltage          | $V_C$     | $I_{PP}=10A, t_p=8/20\mu s$        |     | 15      | 20  | V       |
| Junction Capacitance      | $C_j$     | $V_R=0V, f=1MHz$<br>(PIN1 to PIN3) |     |         | 120 | pF      |

## Electrical Parameters (TA = 25°C unless otherwise noted)

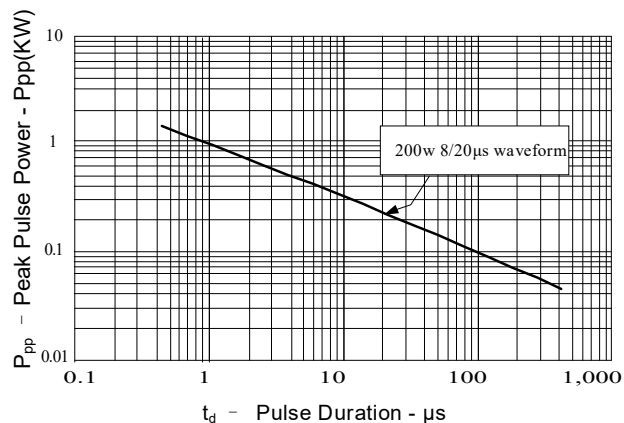
| Symbol    | Parameter                                   |
|-----------|---------------------------------------------|
| $I_{PP}$  | Maximum Reverse Peak Pulse Current          |
| $V_C$     | Clamping Voltage @ $I_{PP}$                 |
| $V_{RWM}$ | Working Peak Reverse Voltage                |
| $I_R$     | Maximum Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$  | Breakdown Voltage @ $I_T$                   |
| $I_T$     | Test Current                                |
|           |                                             |
|           |                                             |

Note: 8/20 $\mu s$  pulse waveform.

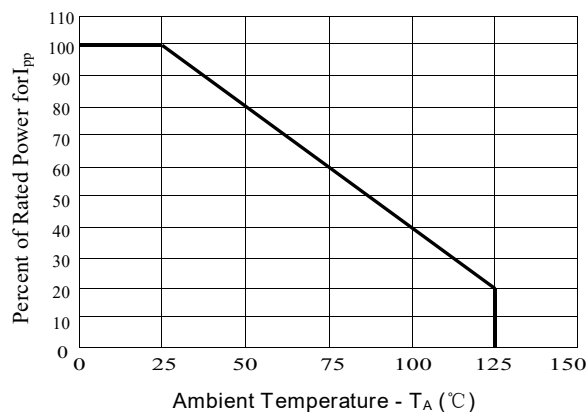


## RATING AND CHARACTERISTIC CURVES

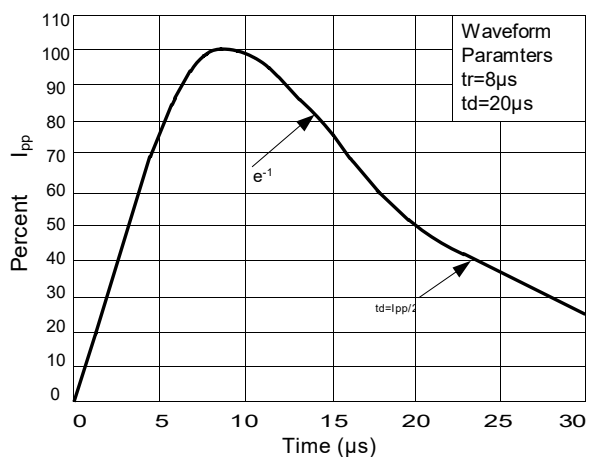
**Figure 1: Peak Pulse Power vs. Pulse Time**



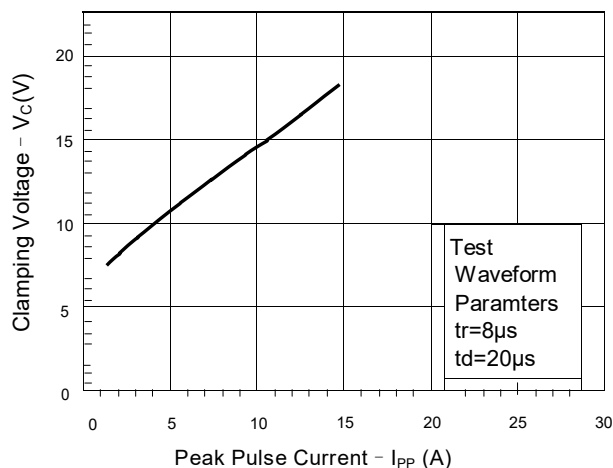
**Figure 2: Power Derating Curve**



**Figure3: Pulse Waveform**

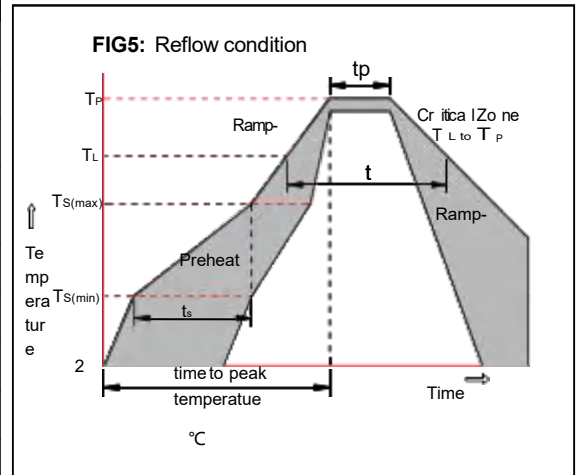


**Figure 4: Clamping Voltage vs. Ipp**



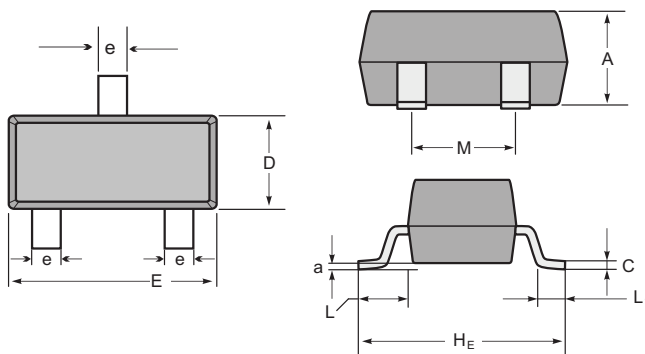
## Soldering parameters

| 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                             |



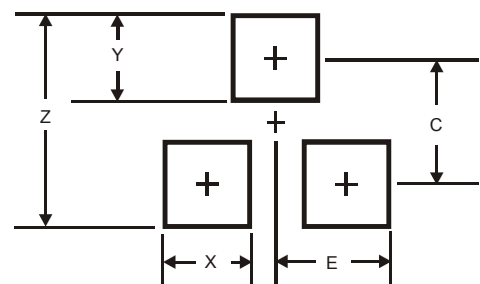
## Package Dimensions & Suggested Pad Layout

### SOT23



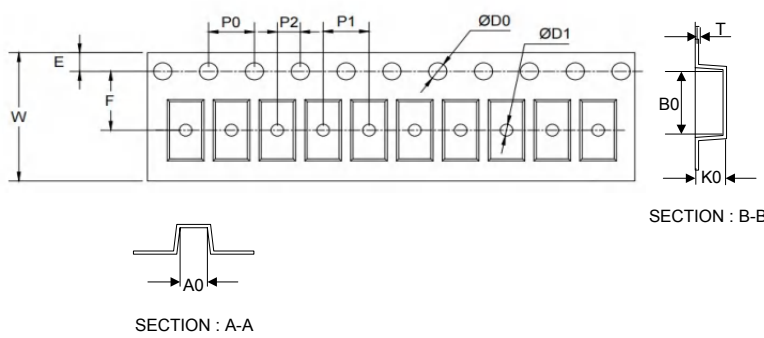
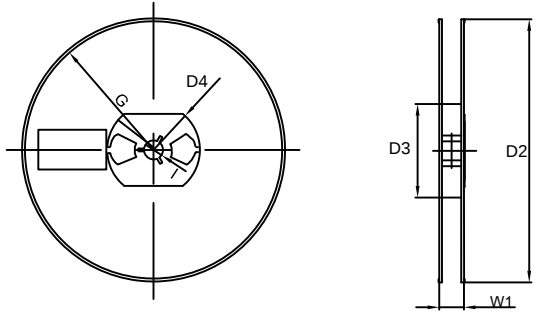
SOT-23 mechanical data

| 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) |
|-----------------------------------------------------------------------------------------------------------------------------|--|-------------------|----------------|
|  <p>SECTION : A-A</p> <p>SECTION : B-B</p> |  | 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      |
| 7" Reel                                                                                                                     |  | D2                | 178.0±3.0      |
|                                          |  | D3                | 55Min.         |
|                                                                                                                             |  | D4                | R24.0±3.0      |
|                                                                                                                             |  | G                 | R82.0±3.0      |
|                                                                                                                             |  | I                 | 13.0±2.0       |
|                                                                                                                             |  | W1                | 11.0±3.0       |
|                                                                                                                             |  | Quantity: 3000PCS |                |