

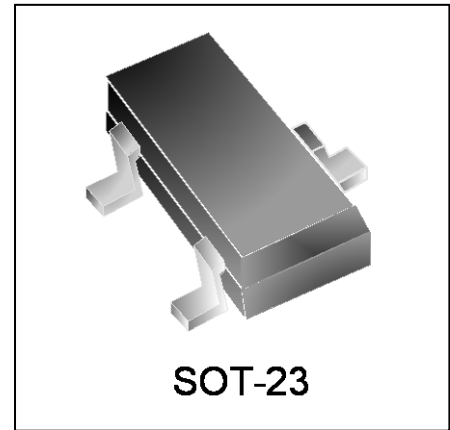


## Features

- 450 watts peak pulse power ( $t_p = 8/20\mu s$ )
- Response Time is Typically  $< 1\text{ ns}$
- Protects one bidirectional line or two unidirectional lines
- Working Voltages: 24V
- Low clamping voltages
- AEC-Q101 Qualified

## IEC Compatibility (EN61000-4)

- IEC 61000-4-2 (ESD)  $\pm 30\text{kV}$  (air),  $\pm 30\text{kV}$  (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 8A (8/20 $\mu s$ )



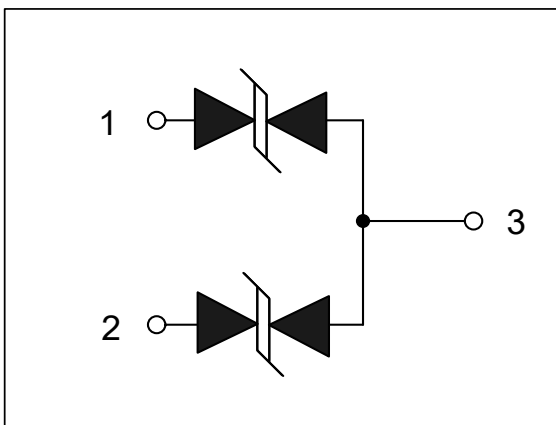
## Mechanical Characteristics

- JEDEC SOT-23 package
- Molding compound flammability rating:
- UL 94V-0
- Marking : Marking Code
- Packaging : Tape and Reel per EIA 481
- RoHS Compliant

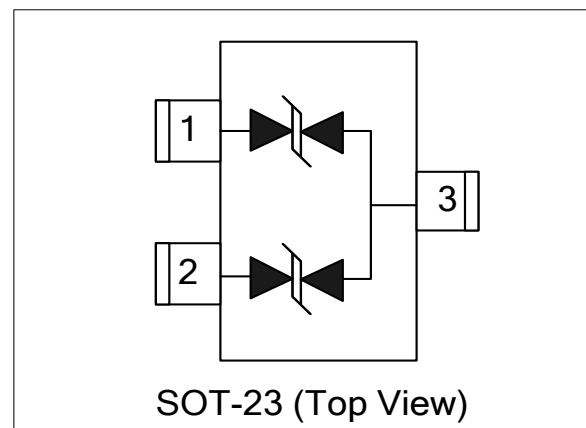
## Applications

- Automotive Networks
- Control & Monitoring Systems
- Portable Electronics
- Set-Top Box
- Servers, Notebook, and Desktop PC
- Wireless Bus Protection

## Circuit Diagram



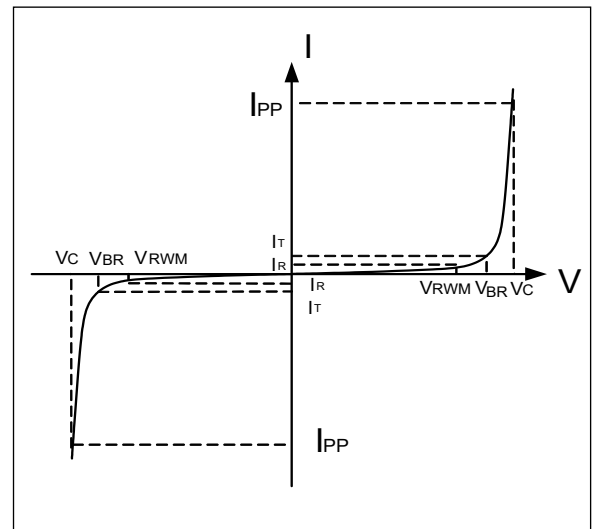
## Schematic & PIN Configuration



| Absolute Maximum Rating                |           |             |             |
|--|-----------|-------------|-------------|
| Rating                                 | Symbol    | Value       | Units       |
| Peak Pulse Power ( $t_p=8/20\mu s$ )   | $P_{PP}$  | 450         | Watts       |
| Peak Pulse Current ( $t_p=8/20\mu s$ ) | $I_{PP}$  | 8           | A           |
| Operating Temperature                  | $T_J$     | -55 to +125 | $^{\circ}C$ |
| Storage Temperature                    | $T_{STG}$ | -55 to +150 | $^{\circ}C$ |

### Electrical Parameters ( $T=25^{\circ}C$ )

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



### Electrical Characteristics

| DW24M2T-B-AT-S                    |           |  |         |         |         |          |
|-----------------------------------|-----------|--|---------|---------|---------|----------|
| Parameter                         | Symbol    | Conditions                                       | Minimum | Typical | Maximum | Units    |
| Reverse Stand-Off Voltage         | $V_{RWM}$ |  |         |         | 24      | V        |
| Reverse Breakdown Voltage         | $V_{BR}$  | $I_T=1mA$  | 26..7   |         |         | V        |
| Reverse Leakage Current           | $I_R$     | $V_{RWM}=24V, T=25^{\circ}C$                     |         |         | 200     | nA       |
| Clamping Voltage                  | $V_C$     | $I_{PP}=8A, t_p=8/20\mu s$                       |         | 50      | 54      | V        |
| Dynamic Resistance <sup>1,2</sup> | $R_{DYN}$ | TLP=0.2/100ns                                    |         | 0.4     |         | $\Omega$ |
| ESD Clamping Voltage <sup>1</sup> | $V_C$     | $I_{PP} = 4A,$<br>$t_p = 0.2/100ns$ (TLP)        |         | 38.0    |         | V        |
| ESD Clamping Voltage <sup>1</sup> | $V_C$     | $I_{PP} = 16A,$<br>$t_p = 0.2/100ns$ (TLP)       |         | 43.0    |         | V        |
| Junction Capacitance              | $C_j$     | Pin 1 to 3 or Pin 2 to 3<br>$V_R = 0V, f = 1MHz$ |         | 25      | 35      | pF       |

Notes : 1、TLP Setting :  $t_p=100ns, t_r=0.2ns, I_{TLP}$  and  $V_{TLP}$  sample window:  $t_1=70ns$  to  $t_2=90ns$ .

2、Dynamic resistance calculated from  $I_{PP}=4A$  to  $I_{PP}=16A$  using "Best Fit"

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## Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

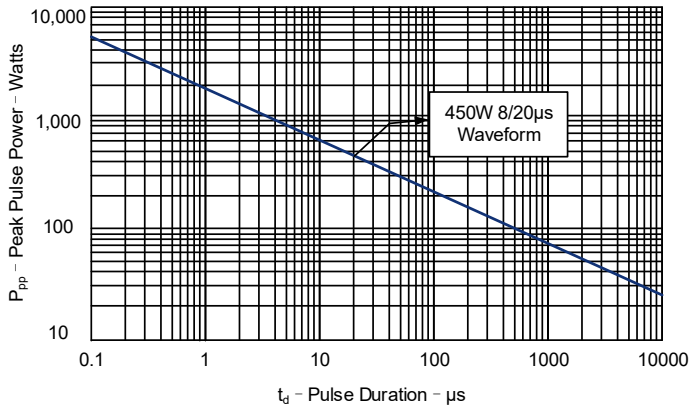


Figure 2: Power Derating Curve

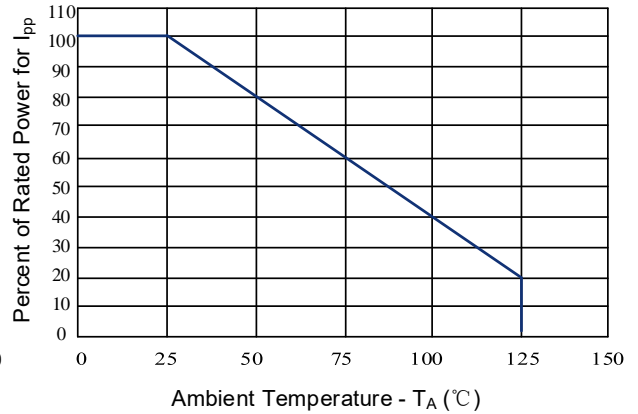


Figure 3: Clamping Voltage vs. Peak Pulse Current

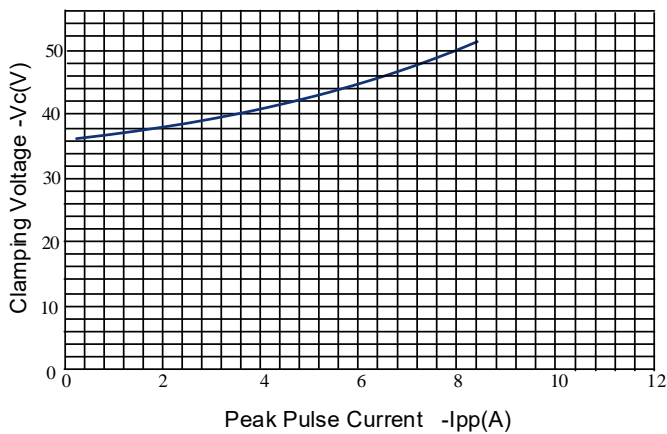


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

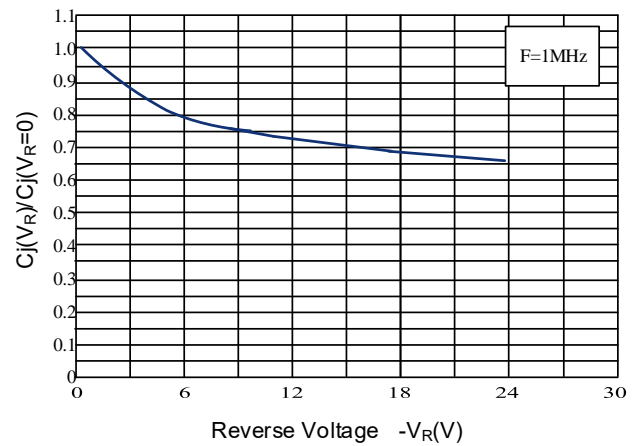


Figure 5: 8/20µs Pulse Waveform

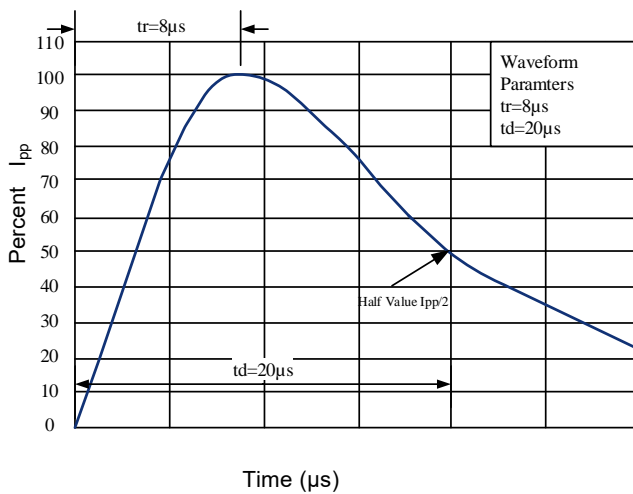
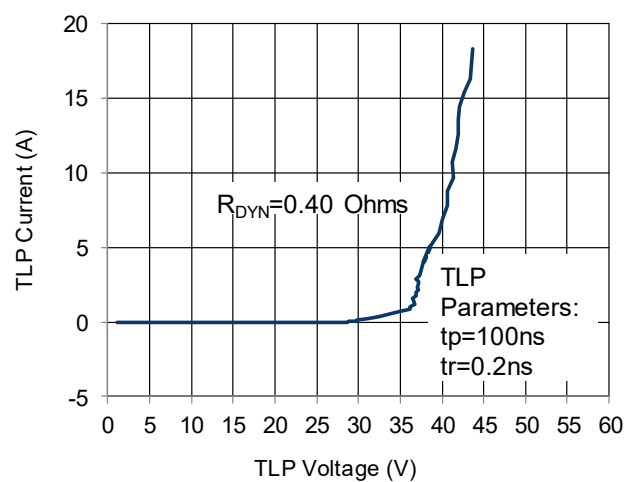


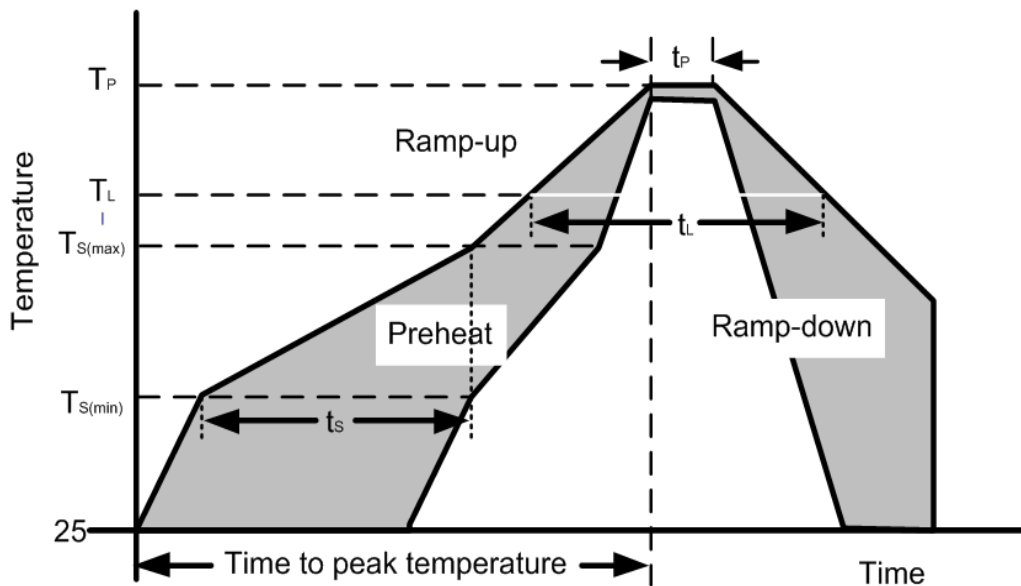
Figure 6: TLP I-V Curve



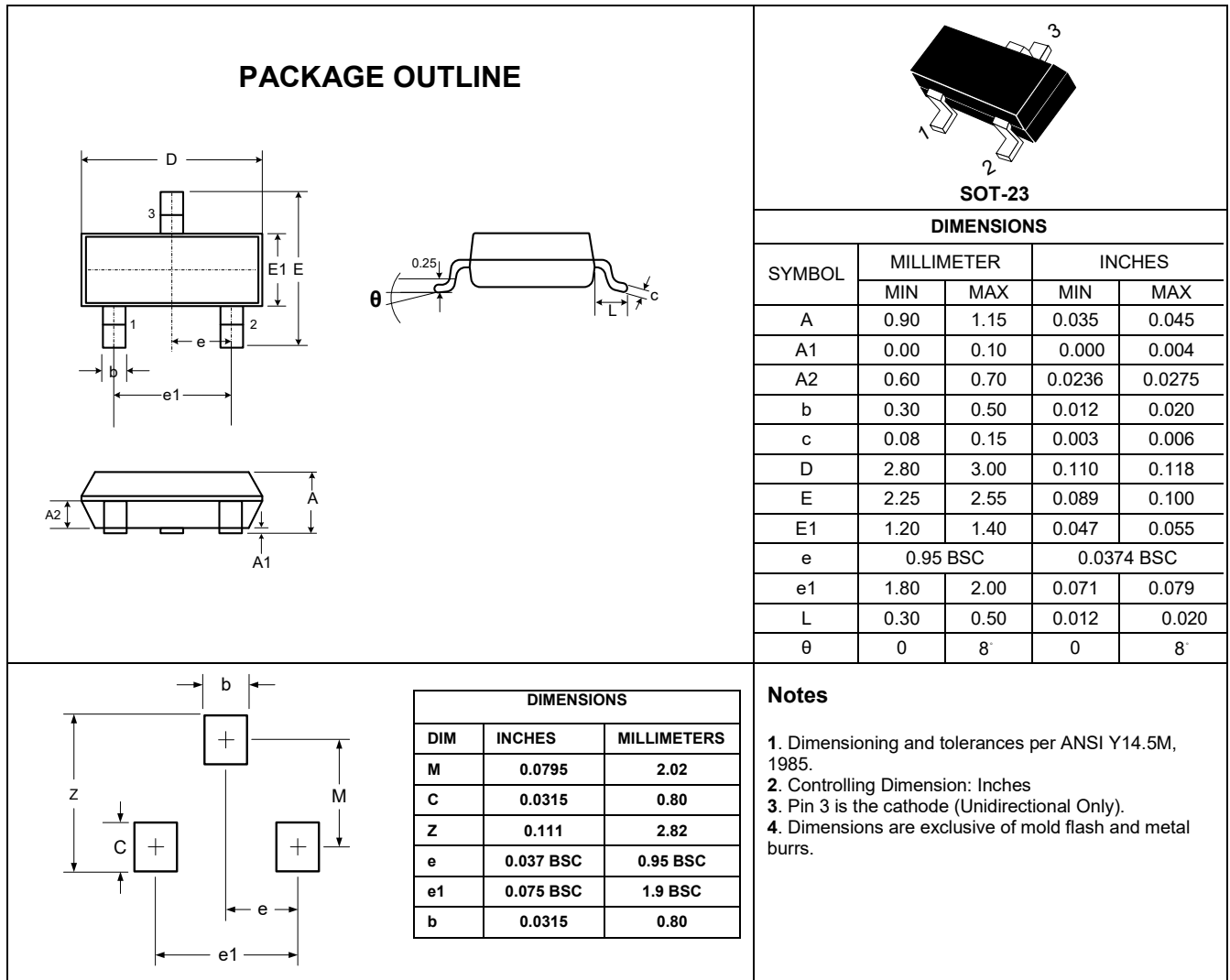


### Soldering Parameters

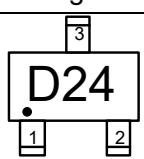
| Reflow Condition                                       |                                  | Pb – Free assembly |
|--|----------------------------------|--------------------|
| Pre Heat   | Temperature Min ( $T_{s(min)}$ ) | 150°C              |
|  | Temperature Max ( $T_{s(max)}$ ) | 200°C              |
|  | Time (min to max) ( $t_s$ )      | 60 – 190 secs      |
| Average ramp up rate (Liquidus Temp) ( $T_L$ ) to peak |                                  | 5°C/second max     |
| $T_{s(max)}$ to $T_L$ —Ramp-up Rate                    |                                  | 5°C/second max     |
| Reflow   | Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|  | Temperature ( $t_L$ )            | 60 – 150 seconds   |
| Peak Temperature ( $T_P$ )                             |                                  | 260+0/-5 °C        |
| Time within actual peak Temperature ( $t_p$ )          |                                  | 20 – 40 seconds    |
| Ramp-down Rate   |                                  | 5°C/second max     |
| Time 25°C to peak Temperature ( $T_P$ )                |                                  | 8 minutes Max.     |
| Do not exceed  |                                  | 280°C              |



## Outline Drawing – SOT-23



## Marking Codes

| Part Number    | Marking Code  |
|----------------|---|
| DW24M2T-B-AT-S |  <p>The diagram shows a rectangular marking area with 'D24' inside, a small square above it with '3', and small squares below it with '1' and '2'.</p> |

## Package Information

Qty: 3k/Reel