

**Silicon Planar Zener Diodes**

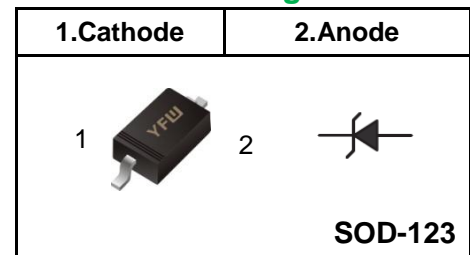
**FEATURES**

- ◆ Total power dissipation: Max. 1 W.
- ◆ Wide zener reverse voltage range 3.3V to 330V.
- ◆ Small plastic package suitable for surface mounted design.
- ◆ Lead free in comply with EU RoHS 2011/65/EU directives

**MECHANICAL DATA**

- ◆ Case: SOD-123
- ◆ Terminals: Solderable per MIL-STD-750, Method 2026
- ◆ Approx. Weight: 15mg /0.00048oz

**Pinning**

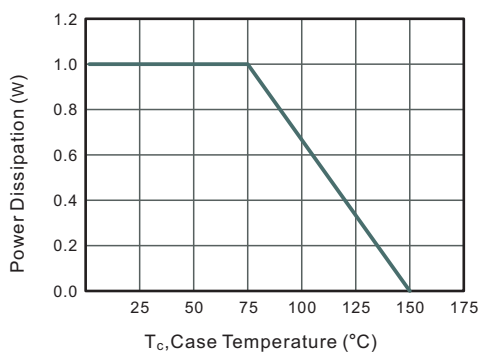


**Absolute Maximum Ratings And Characteristics (Ta = 25 °C)**

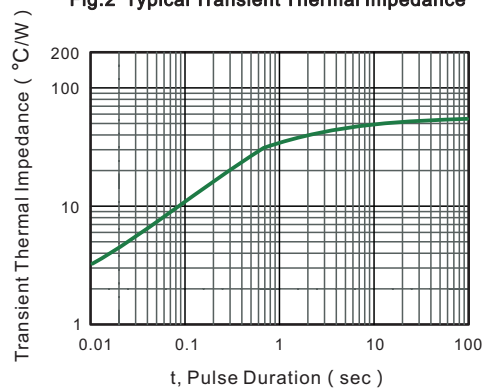
| Parameter   | Symbol                                | Value      | Unit        |
|---|---------------------------------------|------------|-------------|
| Power Dissipation at TL=75°C                                  | <b>P<sub>D</sub></b>                  | 1          | <b>W</b>    |
| Forward Voltage at IF = 200 mA                                | <b>V<sub>F</sub></b>                  | 1.2        | <b>V</b>    |
| Typical thermal resistance junction to ambient <sup>(1)</sup> | <b>R<sub>θJA</sub></b>                | 300        | <b>°C/W</b> |
| Operating and Storage Temperature Range                       | <b>T<sub>j</sub>, T<sub>stg</sub></b> | -55 ~ +150 | <b>°C</b>   |

(1) Thermal resistance from junction to ambient at P.C.B. mounted with 2.0" X 2.0" (5 X 5 cm) copper areas pads.

**Fig.1 Maximum Continuous Power Derating**



**Fig.2 Typical Transient Thermal Impedance**

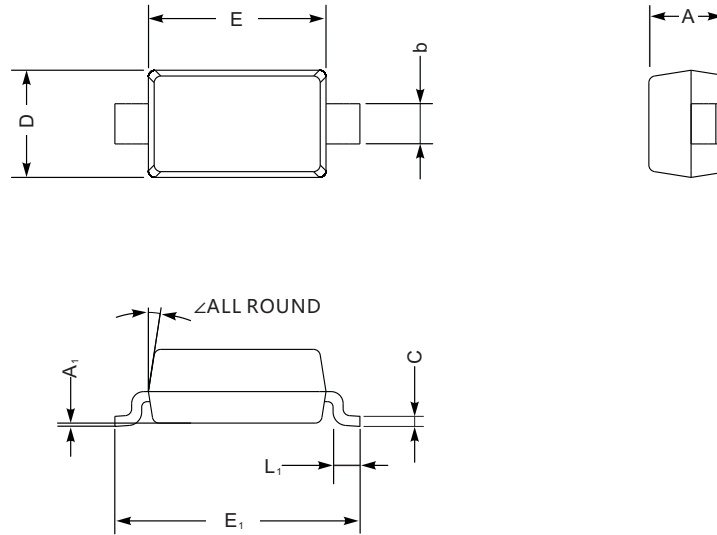


| Type    | Marking | Zener Voltage Range <sup>(1)</sup>     |           |           | I <sub>ZT</sub> | Dynamic Impedance | Reverse Current                        |                | Admissible Zener Current |
|---------|---------|--|-----------|-----------|-----------------|-------------------|--|----------------|--------------------------|
|         |         | V <sub>ZT</sub> ( at I <sub>ZT</sub> ) |           |           |                 |                   | Z <sub>ZT</sub> ( at I <sub>ZT</sub> ) | I <sub>R</sub> |                          |
|         |         | Min ( V )                              | Nom ( V ) | Max ( V ) | (mA)            | Max (Ω)           | Max ( μA )                             | ( V )          | I <sub>ZM</sub> (mA)     |
| MM1W3V3 | FHD     | 3.10                                   | 3.3       | 3.50      | 75              | 10                | 100                                    | 1              | 285                      |
| MM1W3V6 | FHE     | 3.40                                   | 3.6       | 3.80      | 69              | 10                | 100                                    | 1              | 263                      |
| MM1W3V9 | FHF     | 3.70                                   | 3.9       | 4.10      | 64              | 9.0               | 50                                     | 1              | 243                      |
| MM1W4V3 | FHG     | 4.06                                   | 4.3       | 4.56      | 58              | 9.0               | 25                                     | 1              | 219                      |
| MM1W4V7 | FHJ     | 4.50                                   | 4.7       | 4.93      | 53              | 8.0               | 10                                     | 1              | 203                      |
| MM1W5V1 | FHK     | 4.84                                   | 5.1       | 5.36      | 49              | 7.0               | 10                                     | 1              | 186                      |
| MM1W5V6 | FHL     | 5.32                                   | 5.6       | 5.92      | 45              | 5.0               | 10                                     | 2              | 170                      |
| MM1W6V2 | FHN     | 5.86                                   | 6.2       | 6.51      | 41              | 2.0               | 10                                     | 3              | 154                      |
| MM1W6V8 | FHO     | 6.46                                   | 6.8       | 7.18      | 37              | 3.5               | 10                                     | 4              | 140                      |
| MM1W7V5 | FHQ     | 7.12                                   | 7.5       | 7.88      | 34              | 4.0               | 10                                     | 5              | 127                      |
| MM1W8V2 | FHR     | 7.79                                   | 8.2       | 8.67      | 31              | 4.5               | 10                                     | 6              | 116                      |
| MM1W9V1 | FHT     | 8.60                                   | 9.1       | 9.59      | 28              | 5.0               | 10                                     | 7              | 104                      |
| MM1W10  | FHU     | 9.50                                   | 10        | 10.5      | 25              | 7.0               | 10                                     | 7              | 95                       |
| MM1W11  | FHV     | 10.4                                   | 11        | 11.6      | 23              | 8.0               | 5                                      | 8              | 86                       |
| MM1W12  | FHW     | 11.4                                   | 12        | 12.6      | 21              | 9.0               | 5                                      | 9              | 79                       |
| MM1W13  | FHX     | 12.4                                   | 13        | 14.1      | 19              | 10                | 5                                      | 10             | 71                       |
| MM1W15  | FHZ     | 13.8                                   | 15        | 15.8      | 17              | 14                | 5                                      | 11             | 63                       |
| MM1W16  | FJA     | 15.2                                   | 16        | 17.1      | 16              | 16                | 5                                      | 12             | 58                       |
| MM1W18  | FJF     | 16.8                                   | 18        | 19.2      | 14              | 20                | 5                                      | 13             | 52                       |
| MM1W20  | FJG     | 19.0                                   | 20        | 21.2      | 13              | 22                | 5                                      | 15             | 47                       |
| MM1W22  | FJK     | 20.8                                   | 22        | 23.3      | 12              | 23                | 5                                      | 17             | 43                       |
| MM1W24  | FJL     | 22.8                                   | 24        | 26.0      | 11              | 25                | 5                                      | 18             | 38                       |
| MM1W27  | FJN     | 25.3                                   | 27        | 28.9      | 9.5             | 35                | 5                                      | 21             | 35                       |
| MM1W30  | FJQ     | 28.2                                   | 30        | 32.0      | 8.5             | 40                | 5                                      | 23             | 31                       |
| MM1W33  | FJR     | 31.3                                   | 33        | 34.9      | 7.5             | 45                | 5                                      | 25             | 28                       |
| MM1W36  | FJS     | 34.2                                   | 36        | 37.9      | 7.0             | 50                | 5                                      | 27             | 26                       |
| MM1W39  | FJT     | 37.2                                   | 39        | 41.5      | 6.5             | 60                | 5                                      | 30             | 24                       |
| MM1W43  | FLG     | 40.9                                   | 43        | 45.6      | 6.0             | 70                | 1                                      | 32             | 22                       |
| MM1W47  | FLJ     | 44.9                                   | 47        | 49.8      | 5.5             | 80                | 1                                      | 35             | 20                       |
| MM1W51  | FLK     | 48.6                                   | 51        | 54.0      | 5.0             | 95                | 1                                      | 38             | 18                       |
| MM1W56  | FLL     | 53.6                                   | 56        | 58.8      | 4.5             | 110               | 1                                      | 42             | 17                       |
| MM1W62  | FLN     | 58.9                                   | 62        | 65.6      | 4.0             | 125               | 1                                      | 47             | 15                       |
| MM1W68  | FLO     | 64.6                                   | 68        | 71.7      | 3.7             | 150               | 1                                      | 52             | 14                       |
| MM1W75  | FLQ     | 71.2                                   | 75        | 78.8      | 3.3             | 175               | 1                                      | 56             | 12                       |
| MM1W82  | FLR     | 77.9                                   | 82        | 87.0      | 3.0             | 200               | 1                                      | 62             | 11                       |
| MM1W91  | FLT     | 86.0                                   | 91        | 96.0      | 2.8             | 250               | 1                                      | 69             | 10                       |
| MM1W100 | FLU     | 95.0                                   | 100       | 105       | 2.5             | 350               | 1                                      | 76             | 9.5                      |
| MM1W110 | FLV     | 104                                    | 110       | 116       | 2.3             | 450               | 1                                      | 84             | 8.6                      |
| MM1W120 | FLW     | 114                                    | 120       | 127       | 2.0             | 550               | 1                                      | 91             | 7.8                      |
| MM1W135 | FLX     | 125                                    | 135       | 142       | 1.9             | 700               | 1                                      | 100            | 7.0                      |
| MM1W150 | FLZ     | 140                                    | 150       | 157       | 1.7             | 900               | 1                                      | 110            | 6.3                      |
| MM1W165 | FPA     | 155                                    | 165       | 172       | 1.6             | 1100              | 1                                      | 120            | 5.8                      |
| MM1W180 | FPF     | 170                                    | 180       | 191       | 1.4             | 1200              | 1                                      | 135            | 5.2                      |
| MM1W200 | FPG     | 189                                    | 200       | 211       | 1.2             | 1400              | 1                                      | 150            | 4.7                      |
| MM1W220 | FPK     | 209                                    | 220       | 231       | 1.0             | 1600              | 1                                      | 165            | 4.3                      |
| MM1W240 | FPL     | 229                                    | 240       | 251       | 1.0             | 1800              | 1                                      | 180            | 3.9                      |
| MM1W260 | FPM     | 249                                    | 260       | 271       | 1.0             | 2000              | 1                                      | 190            | 3.7                      |
| MM1W280 | FPN     | 269                                    | 280       | 291       | 1.0             | 2100              | 1                                      | 205            | 3.4                      |
| MM1W300 | FPQ     | 289                                    | 300       | 315       | 1.0             | 2300              | 1                                      | 230            | 3.1                      |
| MM1W330 | FLR     | 313                                    | 330       | 346       | 1.0             | 2500              | 1                                      | 250            | 2.8                      |

( 1 ) V<sub>ZT</sub> is tested with pulses (20 ms)

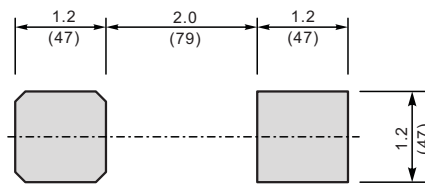
**Package Outline SOD-123**

Plastic surface mounted package; 2 leads



| UNIT |     | A   | C    | D   | E   | E <sub>1</sub> | L <sub>1</sub> | b   | A <sub>1</sub> | ∠  |
|------|-----|-----|------|-----|-----|----------------|----------------|-----|----------------|----|
| mm   | max | 1.3 | 0.22 | 1.8 | 2.8 | 3.9            | 0.45           | 0.7 | 0.2            | 9° |
|      | min | 0.9 | 0.09 | 1.5 | 2.5 | 3.6            | 0.25           | 0.5 | —              |    |
| mil  | max | 51  | 8.7  | 71  | 110 | 154            | 18             | 28  | 8              |    |
|      | min | 35  | 3.5  | 59  | 98  | 142            | 10             | 20  | —              |    |

**The recommended mounting pad size**



Unit:  $\frac{\text{mm}}{\text{mil}}$

**Summary of Packing Options**

| Package | Packing Description | Packing Quantity | Industry Standard |
|---------|---------------------|------------------|-------------------|
| SOD-123 | Tape/Reel, 7" reel  | 3000             | EIA-481-1         |