

# ZMD3.9 ~ ZMD100

$V_Z$  : 3.9 to 100 Volts

$P_D$  : 1 Watts

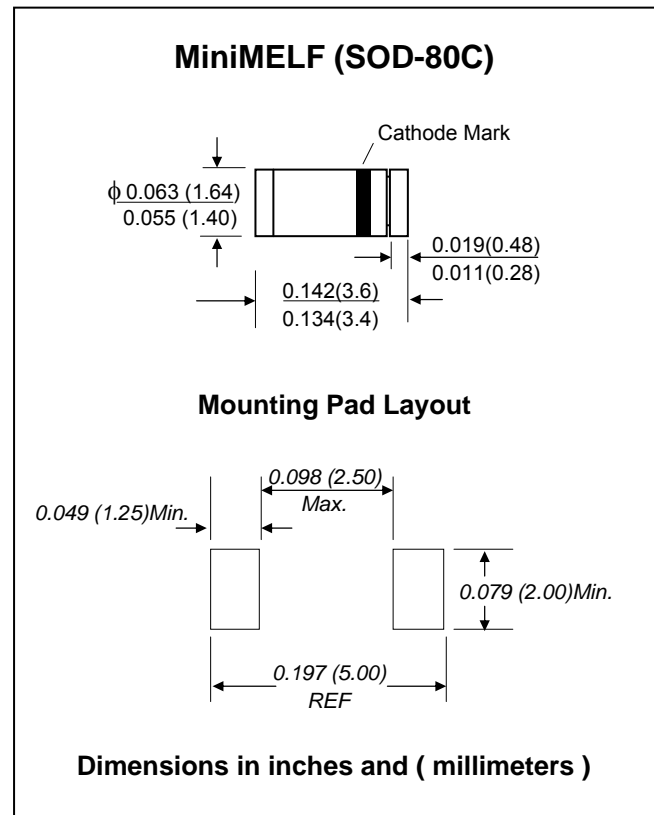
### FEATURES :

- \* Nominal zener voltage 3.9 ~ 100 Volts
- \* Maximum power dissipation 1 Watts
- \* Pb / RoHS Free

### MECHANICAL DATA :

- \* Case : MiniMELF Glass Case (SOD-80C)
- \* Weight : 0.05 gram (approximately)

## ZENER DIODES



### Maximum Ratings and Thermal Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

| Parameter   | Symbol          | Value        | Unit |
|---|-----------------|--------------|------|
| Zener Current see Table "Characteristics"                 |                 |              |      |
| Power Dissipation <sup>(1)</sup>                          | $P_D$           | 1            | W    |
| Thermal Resistance Junction to Ambient Air <sup>(1)</sup> | $R_{\theta JA}$ | 150          | K/W  |
| Thermal Resistance Junction to Terminal                   | $R_{\theta JT}$ | 60           | K/W  |
| Operating Junction Temperature Range                      | $T_J$           | -50 to + 175 | °C   |
| Storage Temperature Range                                 | $T_{STG}$       | -50 to + 175 | °C   |

#### Note:

(1) Mounted on P.C. board with 25 mm<sup>2</sup> copper pads at each terminal.

## ELECTRICAL CHARACTERISTICS

Rating at 25°C ambient temperature unless otherwise specified.

| Type   | Zener Voltage <sup>(2)</sup><br>at $I_{ZT}$ |      | Test<br>Current  | Dynamic<br>Resistance                      |                    | Temp. Coefficient<br>of Zener Voltage         | Reverse Voltage<br>at $I_R = 0.5\mu A$ | Zener<br>Current <sup>(1)</sup> |
|--------|---|------|------------------|--|--------------------|---|--|---------------------------------|
|        | $V_Z$ (V)                                   |      |                  | $r_{zj}$ ( $\Omega$ ) at $f = 1\text{kHz}$ |                    |   |  |                                 |
|        | min.  | max. | $I_{ZT}$<br>(mA) | $I_Z = 5\text{mA}$                         | $I_Z = 1\text{mA}$ | $\alpha_{VZ}$<br>( $10^{-4}/^\circ\text{C}$ ) | $V_{Rmin}$<br>(V)                      | $I_{Zmax}$<br>(mA)              |
| ZMD3.9 | 3.7   | 4.1  | 5                | 80(<95)                                    | -                  | -9...-4                                       | -                                      | 244                             |
| ZMD4.3 | 4.0   | 4.6  | 5                | 80(<95)                                    | -                  | -9...-3                                       | -                                      | 217                             |
| ZMD4.7 | 4.4   | 5.0  | 5                | 70(<78)                                    | <1400              | -8...-3                                       | -                                      | 200                             |
| ZMD5.1 | 4.8   | 5.4  | 5                | 30(<60)                                    | <700               | -8...-3                                       | 0.5(1 $\mu$ A)                         | 185                             |
| ZMD5.6 | 5.2   | 6.0  | 5                | 10(<40)                                    | <500               | -7...-3                                       | 1.0(1 $\mu$ A)                         | 167                             |
| ZMD6.2 | 5.8   | 6.6  | 5                | 4.8(<11)                                   | <300               | -6...-1                                       | 1.5(1 $\mu$ A)                         | 152                             |
| ZMD6.8 | 6.4   | 7.2  | 5                | 4.5(<10)                                   | <300               | -5...+2                                       | 2.0(1 $\mu$ A)                         | 139                             |
| ZMD7.5 | 7.0   | 7.9  | 5                | 4.0(<8)                                    | <100               | -3...+4                                       | 3.5                                    | 127                             |
| ZMD8.2 | 7.7   | 8.7  | 5                | 4.5(<10)                                   | <50                | -2...+6                                       | 5.0                                    | 115                             |
| ZMD9.1 | 8.5   | 9.6  | 5                | 4.8(<11)                                   | <50                | -1...+7                                       | 6.0                                    | 104                             |
| ZMD10  | 9.4   | 10.6 | 5                | 5.2(<15)                                   | <70                | +2...+7                                       | 7.0                                    | 94                              |
| ZMD11  | 10.4  | 11.6 | 5                | 6.0(<20)                                   | <70                | +3...+7                                       | 7.0                                    | 86                              |
| ZMD12  | 11.4  | 12.7 | 5                | 7.0(<20)                                   | <90                | +4...+7                                       | 8.0                                    | 79                              |
| ZMD13  | 12.4  | 14.1 | 5                | 9.0(<25)                                   | <110               | +5...+8                                       | 9.0                                    | 71                              |
| ZMD15  | 13.8  | 15.6 | 5                | 11(<30)                                    | <110               | +5...+8                                       | 10                                     | 64                              |
| ZMD16  | 15.3  | 17.1 | 5                | 13(<40)                                    | <170               | +5...+9                                       | 11                                     | 58                              |
| ZMD18  | 16.8  | 19.1 | 5                | 18(<50)                                    | <170               | +6...+9                                       | 12                                     | 52                              |
| ZMD20  | 18.8  | 21.2 | 5                | 20(<50)                                    | <220               | +7...+9                                       | 13                                     | 47                              |
| ZMD22  | 20.8  | 23.3 | 5                | 25(<55)                                    | <220               | +7...+9                                       | 15                                     | 43                              |
| ZMD24  | 22.8  | 25.6 | 5                | 28(<80)                                    | <220               | +7...+9.5                                     | 16                                     | 39                              |
| ZMD27  | 25.1  | 28.9 | 5                | 30(<80)                                    | <250               | +8...+9.5                                     | 18                                     | 35                              |
| ZMD30  | 28  | 32   | 5                | 35(<80)                                    | <250               | +8...+9.5                                     | 20                                     | 31                              |
| ZMD33  | 31  | 35   | 5                | 40(<80)                                    | <250               | +8...+10                                      | 22                                     | 29                              |
| ZMD36  | 34  | 38   | 5                | 40(<90)                                    | <300               | +8...+10                                      | 24                                     | 26                              |
| ZMD39  | 37  | 41   | 5                | 50(<90)                                    | <500               | +8...+10                                      | 26                                     | 24                              |
| ZMD43  | 40  | 46   | 5                | 60(<100)                                   | <700               | +8...+10                                      | 28                                     | 22                              |
| ZMD47  | 44  | 50   | 5                | 70(<100)                                   | <750               | +8...+10                                      | 31                                     | 20                              |
| ZMD51  | 48  | 54   | 5                | 70(<100)                                   | <750               | +8...+10                                      | 34                                     | 19                              |
| ZMD56  | 52  | 60   | 5                | 70(<100)                                   | <750               | +9...+11                                      | 36                                     | 17                              |
| ZMD62  | 58  | 66   | 5                | 80(<110)                                   | <750               | +9...+11                                      | 41                                     | 15                              |
| ZMD68  | 64  | 72   | 5                | 90(<140)                                   | <750               | +9...+12                                      | 45                                     | 14                              |
| ZMD75  | 70  | 79   | 5                | 95(<150)                                   | <750               | +9...+12                                      | 49                                     | 13                              |
| ZMD82  | 77  | 88   | 5                | 100(<170)                                  | <750               | +9...+12                                      | 54                                     | 11                              |
| ZMD91  | 85  | 96   | 5                | 130(<200)                                  | <800               | +10...+12                                     | 59                                     | 10                              |
| ZMD100 | 94  | 106  | 5                | 200(<300)                                  | <800               | +10...+12                                     | 66                                     | 9                               |

### Notes:

- (1) Mounted on P.C. board with 25 mm<sup>2</sup> copper pads at each terminal.
- (2) Tested with pulses.