

## MMSZ2V4 - MMSZ75

$V_Z$  : 2.4 to 75 V

$P_D$  : 500 mW

### FEATURES :

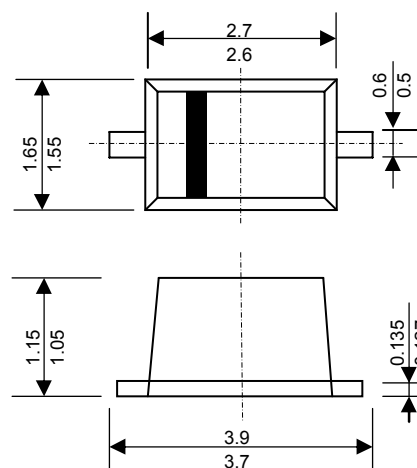
- \* Total Power Dissipation 500 mW on FR-4 or FR-5 Board
- \* Wide Zener Reverse Voltage Range 2.4 V to 75 V
- \* Package Designed for Optimal Automated Board Assembly
- \* Small Package Size for High Density Applications
- \* Pb / RoHS Free

### MECHANICAL DATA :

- \* Case : SOD-123
- \* Weight : 0.01 gram (approximately)

## ZENER DIODES

### SOD-123



Dimensions in millimeters

## Maximum Ratings and Thermal Characteristics

Rating at 25 °C ambient temperature unless otherwise specific.

| Parameter                                                                   | Symbol          | Value        | Unit  |
|-----------------------------------------------------------------------------|-----------------|--------------|-------|
| Total Power Dissipation on FR-5 Board,<br>(Note 1), at $T_L = 75\text{ °C}$ | $P_D$           | 500          | mW    |
| Derated above 75 °C                                                         |                 | 6.7          | mW/°C |
| Thermal Resistance Junction to Ambient                                      | $R_{\theta JA}$ | 340          | °C/W  |
| Thermal Resistance Junction to Lead                                         | $R_{\theta JL}$ | 150          | °C/W  |
| Junction Temperature Range                                                  | $T_J$           | -55 to + 150 | °C    |
| Storage Temperature Range                                                   | $T_{STG}$       | -55 to + 150 | °C    |

### Note :

(1) FR-5 = 3.5 x 1.5 inches

## ELECTRICAL CHARACTERISTICS (Ta = 25 °C unless otherwise note, Vr = 0.9 Vmax. @ If = 10 mA)

| TYPE NO. | Marking | $V_{Z1}^{(1,2)}$<br>@ $I_{ZT1} = 5 \text{ mA}$ |     |       | $Z_{ZT1}^{(3)}$<br>@ $I_{ZT1} = 5 \text{ mA}$ | $V_{Z2}^{(1,2)}$<br>@ $I_{ZT2} = 1 \text{ mA}$ |      | $Z_{ZT2}^{(3)}$<br>@ $I_{ZT2} = 1 \text{ mA}$ | Max. Reverse<br>Leakage<br>Current |      |
|----------|---------|------------------------------------------------|-----|-------|-----------------------------------------------|------------------------------------------------|------|-----------------------------------------------|------------------------------------|------|
|          |         | (V)                                            |     |       | (Ω)                                           | (V)                                            |      | (Ω)                                           | $I_R$ @ $V_R$                      |      |
|          |         | Min                                            | Nom | Max   |                                               | Min                                            | Max  |                                               | (μA)                               | (V)  |
| MMSZ2V4  | 4C      | 2.28                                           | 2.4 | 2.52  | 100                                           | 1.7                                            | 2.1  | 600                                           | 50                                 | 1.0  |
| MMSZ2V7  | 4D      | 2.57                                           | 2.7 | 2.84  | 100                                           | 1.9                                            | 2.4  | 600                                           | 20                                 | 1.0  |
| MMSZ3V0  | 4E      | 2.85                                           | 3.0 | 3.15  | 95                                            | 2.1                                            | 2.7  | 600                                           | 10                                 | 1.0  |
| MMSZ3V3  | 4F      | 3.14                                           | 3.3 | 3.47  | 95                                            | 2.3                                            | 2.9  | 600                                           | 5.0                                | 1.0  |
| MMSZ3V6  | 4H      | 3.42                                           | 3.6 | 3.78  | 90                                            | 2.7                                            | 3.3  | 600                                           | 5.0                                | 1.0  |
| MMSZ3V9  | 4J      | 3.71                                           | 3.9 | 4.10  | 90                                            | 2.9                                            | 3.5  | 600                                           | 3.0                                | 1.0  |
| MMSZ4V3  | 4K      | 4.09                                           | 4.3 | 4.52  | 90                                            | 3.3                                            | 4.0  | 600                                           | 3.0                                | 1.0  |
| MMSZ4V7  | 4M      | 4.47                                           | 4.7 | 4.94  | 80                                            | 3.7                                            | 4.7  | 500                                           | 3.0                                | 2.0  |
| MMSZ5V1  | 4N      | 4.85                                           | 5.1 | 5.36  | 60                                            | 4.2                                            | 5.3  | 480                                           | 2.0                                | 2.0  |
| MMSZ5V6  | 4P      | 5.32                                           | 5.6 | 5.88  | 40                                            | 4.8                                            | 6.0  | 400                                           | 1.0                                | 2.0  |
| MMSZ6V2  | 4R      | 5.89                                           | 6.2 | 6.51  | 10                                            | 5.6                                            | 6.6  | 150                                           | 3.0                                | 4.0  |
| MMSZ6V8  | 4X      | 6.46                                           | 6.8 | 7.14  | 15                                            | 6.3                                            | 7.2  | 80                                            | 2.0                                | 4.0  |
| MMSZ7V5  | 4Y      | 7.13                                           | 7.5 | 7.88  | 15                                            | 6.9                                            | 7.9  | 80                                            | 1.0                                | 5.0  |
| MMSZ8V2  | 4Z      | 7.79                                           | 8.2 | 8.61  | 15                                            | 7.6                                            | 8.7  | 80                                            | 0.7                                | 5.0  |
| MMSZ9V1  | 5A      | 8.65                                           | 9.1 | 9.56  | 15                                            | 8.4                                            | 9.6  | 100                                           | 0.5                                | 6.0  |
| MMSZ10   | 5B      | 9.50                                           | 10  | 10.50 | 20                                            | 9.3                                            | 10.6 | 150                                           | 0.2                                | 7.0  |
| MMSZ11   | 5C      | 10.45                                          | 11  | 11.55 | 20                                            | 10.2                                           | 11.6 | 150                                           | 0.1                                | 8.0  |
| MMSZ12   | 5D      | 11.40                                          | 12  | 12.60 | 25                                            | 11.2                                           | 12.7 | 150                                           | 0.1                                | 8.0  |
| MMSZ13   | 5E      | 12.35                                          | 13  | 13.65 | 30                                            | 12.3                                           | 14.0 | 170                                           | 0.1                                | 8.0  |
| MMSZ15   | 5F      | 14.25                                          | 15  | 15.75 | 30                                            | 13.7                                           | 15.5 | 200                                           | 0.05                               | 10.5 |
| MMSZ16   | 5H      | 15.20                                          | 16  | 16.80 | 40                                            | 15.2                                           | 17.0 | 200                                           | 0.05                               | 11.2 |
| MMSZ18   | 5J      | 17.10                                          | 18  | 18.90 | 45                                            | 16.7                                           | 19.0 | 225                                           | 0.05                               | 12.6 |
| MMSZ20   | 5K      | 19.00                                          | 20  | 21.00 | 55                                            | 18.7                                           | 21.1 | 225                                           | 0.05                               | 14.0 |
| MMSZ22   | 5M      | 20.90                                          | 22  | 23.10 | 55                                            | 20.7                                           | 23.2 | 250                                           | 0.05                               | 15.4 |
| MMSZ24   | 5N      | 22.80                                          | 24  | 25.20 | 70                                            | 22.7                                           | 25.5 | 250                                           | 0.05                               | 16.8 |

### Notes :

- (1) The type number shown have a standard tolerance of  $\pm 5\%$  on the nominal Zener Voltage.
- (2) Tolerance and Voltage Designation: Zener Voltage ( $V_Z$ ) is measured with the Zener Current applied for  $PW = 1 \text{ ms}$ .
- (3)  $Z_{ZT}$  and  $Z_{ZK}$  are measured by dividing the AC voltage drop across the device by the AC current applied.  
The specified limits are for  $I_{Z(AC)} = 0.1 I_{Z(DC)}$ , with the AC frequency = 1 kHz.

## ELECTRICAL CHARACTERISTICS (Ta = 25 °C unless otherwise note, Vr = 0.9 Vmax. @ If = 10 mA)

| TYPE NO. | Marking | $V_{Z1}^{(1,2)}$<br>@ $I_{ZT1} = 2 \text{ mA}$ |     |       | $Z_{ZT1}^{(3)}$<br>@ $I_{ZT1} = 2 \text{ mA}$ | $V_{Z2}^{(1,2)}$<br>@ $I_{ZT2} = 0.1 \text{ mA}$ |      | $Z_{ZT2}^{(3)}$<br>@ $I_{ZT2} = 0.5 \text{ mA}$ | Max. Reverse<br>Leakage<br>Current |         |
|----------|---------|------------------------------------------------|-----|-------|-----------------------------------------------|--------------------------------------------------|------|-------------------------------------------------|------------------------------------|---------|
|          |         | (V)                                            |     |       | (Ω)                                           | (V)                                              |      | (Ω)                                             | $I_R$                              | @ $V_R$ |
|          |         | Min                                            | Nom | Max   |                                               | Min                                              | Max  |                                                 | (μA)                               | (V)     |
| MMSZ27   | 5P      | 25.65                                          | 27  | 28.35 | 80                                            | 25.0                                             | 28.9 | 300                                             | 0.05                               | 18.9    |
| MMSZ30   | 5R      | 28.50                                          | 30  | 31.50 | 80                                            | 27.8                                             | 32.0 | 300                                             | 0.05                               | 21.0    |
| MMSZ33   | 5X      | 31.35                                          | 33  | 34.65 | 80                                            | 30.8                                             | 35.0 | 325                                             | 0.05                               | 23.1    |
| MMSZ36   | 5Y      | 34.20                                          | 36  | 37.80 | 90                                            | 33.8                                             | 38.0 | 350                                             | 0.05                               | 25.2    |
| MMSZ39   | 5Z      | 37.05                                          | 39  | 40.95 | 130                                           | 36.7                                             | 41.0 | 350                                             | 0.05                               | 27.3    |
| MMSZ43   | 6A      | 40.85                                          | 43  | 45.15 | 150                                           | 39.7                                             | 46.0 | 375                                             | 0.05                               | 30.1    |
| MMSZ47   | 6B      | 44.65                                          | 47  | 49.35 | 170                                           | 43.7                                             | 50.0 | 375                                             | 0.05                               | 32.9    |
| MMSZ51   | 6C      | 48.45                                          | 51  | 53.55 | 180                                           | 47.6                                             | 54.0 | 400                                             | 0.05                               | 35.7    |
| MMSZ56   | 6D      | 53.20                                          | 56  | 58.80 | 200                                           | 51.5                                             | 60.0 | 425                                             | 0.05                               | 39.2    |
| MMSZ62   | 6E      | 58.00                                          | 62  | 66.00 | 200                                           | -                                                | -    | -                                               | 0.2                                | 47      |
| MMSZ68   | 6F      | 64.00                                          | 68  | 72.00 | 250                                           | -                                                | -    | -                                               | 0.2                                | 52      |
| MMSZ75   | 6H      | 70.00                                          | 75  | 79.00 | 300                                           | -                                                | -    | -                                               | 0.2                                | 57      |

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