



## Features

- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Typical  $I_R$  less than 5uA above 7.5V
- High temperature soldering guaranteed: 260°C / 10 seconds at terminals

## Mechanical Data

|                    |                                                                         |
|--------------------|-------------------------------------------------------------------------|
| Case               | : Molded plastic over passivated junction                               |
| Terminals          | : Pure tin plated lead free,<br>solderable per MIL-STD-750, Method 2025 |
| Polarity           | : Colour Band denotes positive end (cathode)                            |
| Standard Packaging | : 12mm tape (EIA-481)                                                   |
| Weight             | : 0.002oz, 0.064g                                                       |

## Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

| Type Number                                                                                                      | Symbol         | Value        | Units |
|------------------------------------------------------------------------------------------------------------------|----------------|--------------|-------|
| Power Dissipation, $R_{thJA} < 30k/W$ , $T_a = 60^\circ C$                                                       | $P_D$          | 3            | W     |
| Power Dissipation, $R_{thJA} < 100k/W$ , $T_a = 25^\circ C$                                                      | $P_D$          | 1.25         |       |
| Non Repetitive Peak Surge Power Dissipation (Note 1)                                                             | $P_{ZSM}$      | 60           |       |
| Non Repetitive Peak Forward Surge Current, 8.3ms Single Half Sine-wave Superimposed on Rated Load (JEDEC method) | $I_{FSM}$      | 10           | A     |
| Operating and Storage Temperature Range                                                                          | $T_J, T_{STG}$ | -55 to + 150 | °C    |

**Notes:** 1. Non Repetitive Peak surge  $P_D$  Test Conditions:  $t_p = 100\mu s$  sq. pulse,  $T_j = 25^\circ C$  prior to surge.

# Zener Diode



## Electrical Characteristics

( $T_A = 25^\circ\text{C}$  unless otherwise noted)  $V_F = 1.2\text{V}$  max,  $I_F = 200\text{mA}$  for all types.

| Device<br>(Note 1) | Device<br>Marking<br>Code | Nominal<br>Zener Voltage<br>V <sub>Z</sub> @ I <sub>ZT</sub><br>Voltage<br>(Notes 2 & 3) | Test<br>Current<br>I <sub>ZT</sub><br>mA | Maximum Zener Impedance (Note 4)       |                                   | Leakage Current                 |    | Surge<br>Current @<br>T <sub>A</sub> = 25°C<br>I <sub>r</sub> - mA<br>(Note 5) |        |
|--------------------|---------------------------|------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------|-----------------------------------|---------------------------------|----|--------------------------------------------------------------------------------|--------|
|                    |                           |                                                                                          |                                          | Z <sub>ZT</sub> @ I <sub>ZT</sub><br>Ω | Z <sub>ZK</sub> @ I <sub>ZK</sub> | I <sub>R</sub> @ V <sub>R</sub> |    |                                                                                |        |
|                    |                           |                                                                                          |                                          |                                        |                                   | Ω                               | mA |                                                                                | uA Max |
| 1SMA4737           | 737A                      | 7.5                                                                                      | 100                                      | 3                                      | 700                               | 0.25                            | 5  | 5                                                                              | 607    |
| 1SMA4738           | 738A                      | 8.2                                                                                      |                                          | 3.5                                    |                                   |                                 |    | 6                                                                              | 555    |
| 1SMA4739           | 739A                      | 9.1                                                                                      | 50                                       | 4                                      |                                   |                                 |    | 7                                                                              | 500    |
| 1SMA4740           | 740A                      | 10                                                                                       |                                          | 4                                      |                                   |                                 |    | 7.5                                                                            | 455    |

- Notes:**
1. Tolerance and Type Number Designation. The type numbers listed have a standard tolerance on the nominal zener voltage of  $\pm 5\%$ .
  2. Specials Available Include:
    - A. Nominal zener voltages between the voltages shown and tighter voltage tolerances.
    - B. Matched sets.
  3. Zener Voltage ( $V_Z$ ) Measurement. Guarantees the zener voltage when measured at 90 seconds while maintaining the lead temperature ( $T_L$ ) at  $30^\circ\text{C} \pm 1^\circ\text{C}$ , from the diode body.
  4. Zener Impedance ( $Z_Z$ ) Derivation. The zener impedance is derived from the 60 cycle ac voltage, which results when an ac current having an rms value equal to 10% of the dc zener current ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed on  $I_{ZT}$  or  $I_{ZK}$ .
  5. Surge Current ( $I_r$ ) Non-Repetitive. The rating listed in the electrical characteristics table is maximum peak, non-repetitive reverse surge current of 1/2 square wave or equivalent sine wave pulse of 1/120 second duration superimposed on the test current,  $I_{ZT}$ , per JEDEC registration; however, actual device capability is as described in Figure 10.

## Ratings And Characteristic Curves (1SMA4737 THRU 1SMA4740):

FIG.1- POWER TEMPERATURE DERATING CURVE

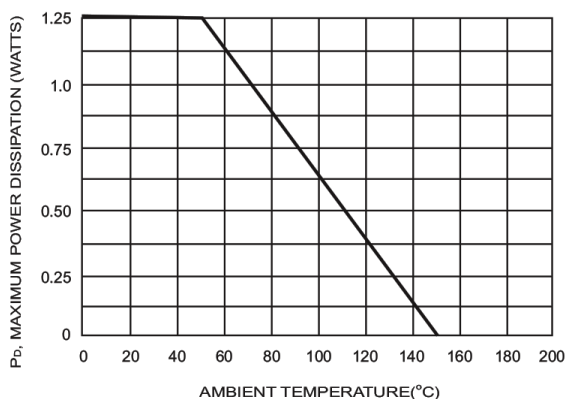


FIG.2- TYPICAL FORWARD CHARACTERISTICS

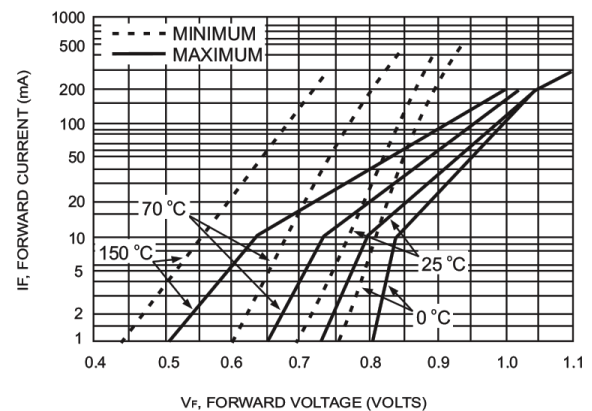


FIG.3- EFFECT OF ZENER CURRENT ON ZENER IMPEDANCE

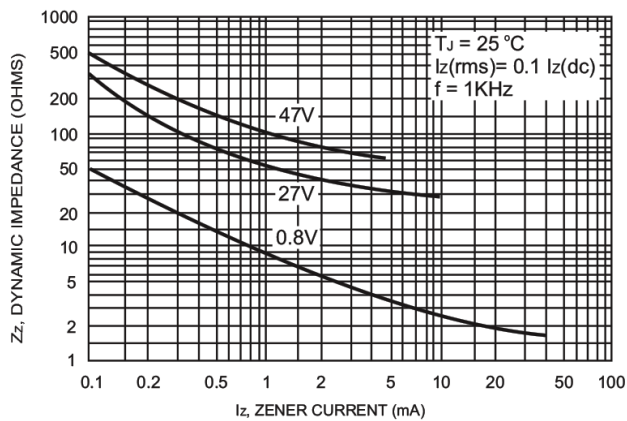


FIG.4- EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

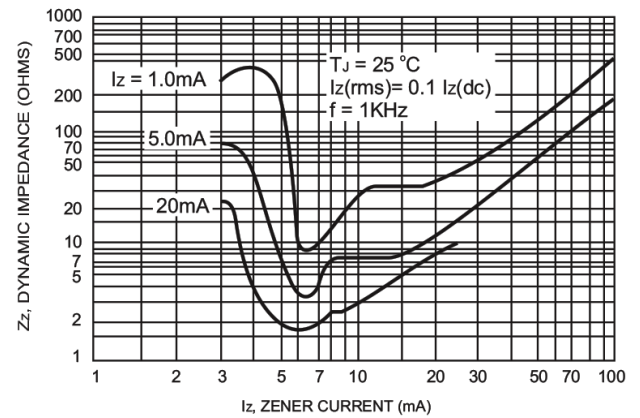


FIG.5- TYPICAL LEAKAGE CURRENT

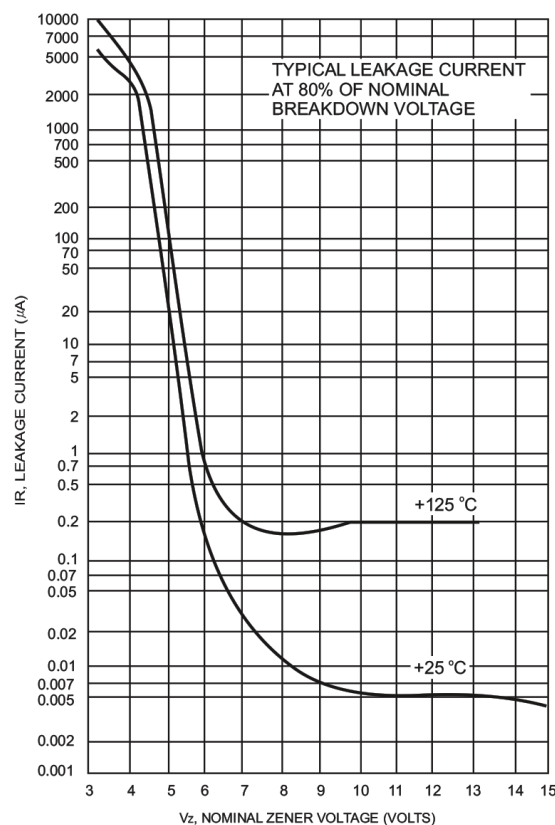


FIG.6- TYPICAL CAPACITANCE versus  $V_z$

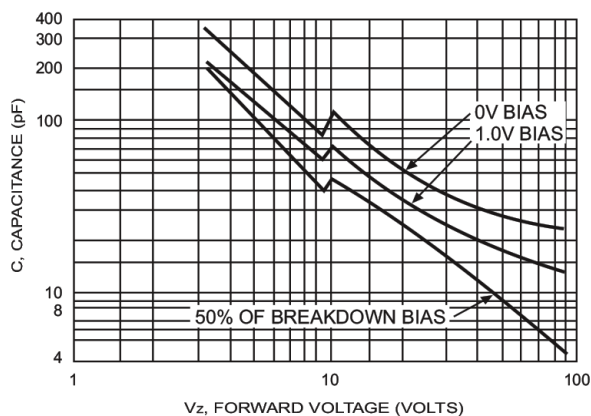


FIG.7- TEMPERATURE COEFFICIENTS

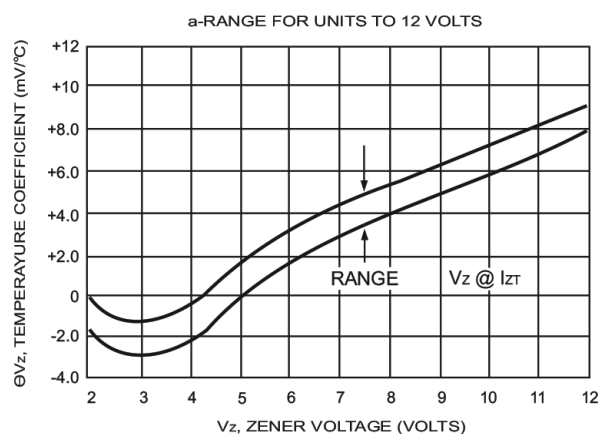


FIG.8- TEMPERATURE COEFFICIENTS

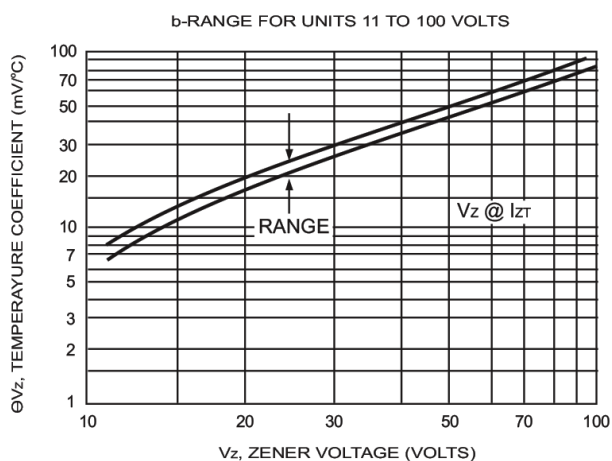


FIG.9- EFFECT OF ZENER CURRENT

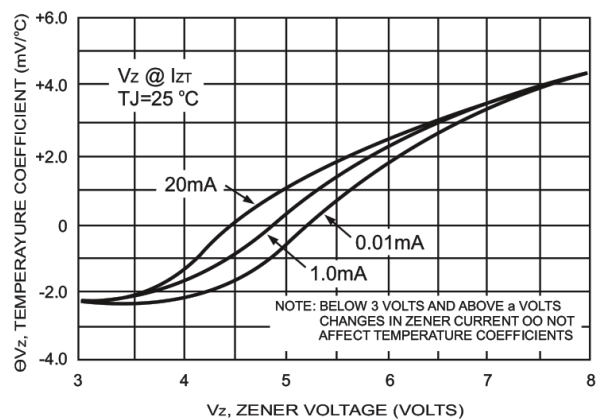
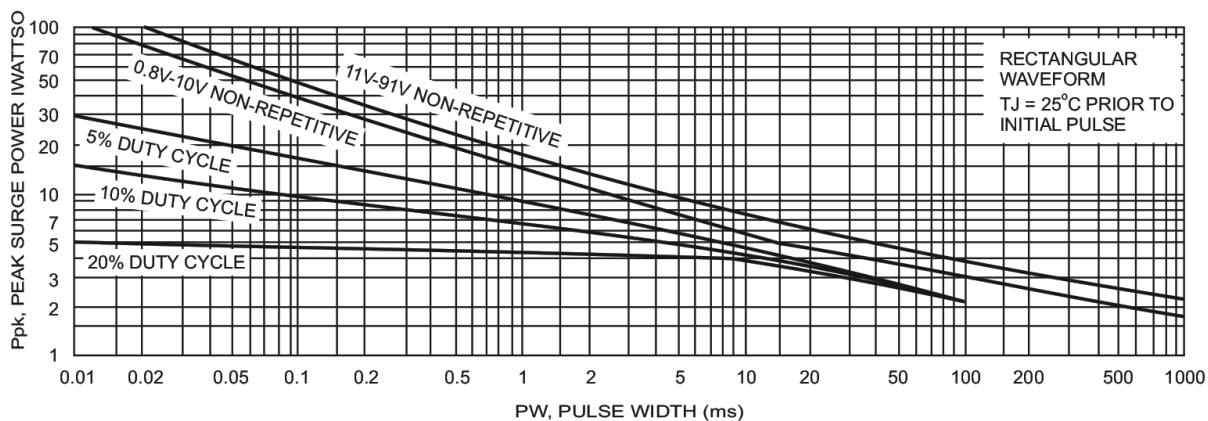
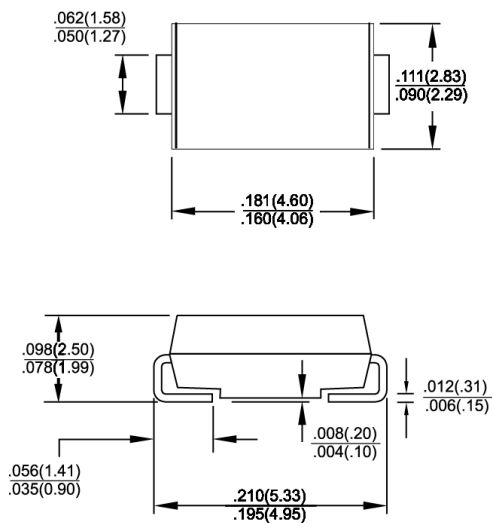


FIG.10- MAXIMUM SURGE POWER



## Dimensions:



Dimensions: Inches (Millimeters)

## Part Number Table

| Description            | Part Number |
|------------------------|-------------|
| Diode, Zener, 7.5V, 1W | 1SMA4737    |
| Diode, Zener, 8.2V, 1W | 1SMA4738    |
| Diode, Zener, 9.1V, 1W | 1SMA4739    |
| Diode, Zener, 10V, 1W  | 1SMA4740    |

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