

## SURFACE MOUNT SILICON ZENER DIODE

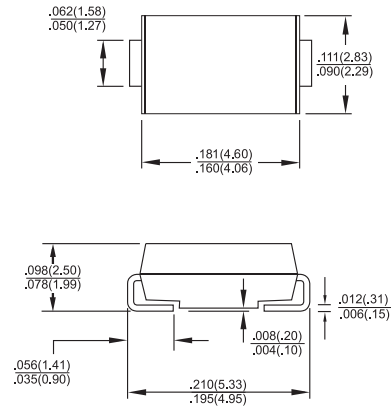
### PRODUCT SUMMARY

1.0 Watts Surface Mount

### FEATURES

For surface mounted applications in order to optimize board space  
 Low profile package  
 Built-in strain relief  
 Glass passivated junction  
 Low inductance  
 Typical IR less than 5.0uA above 11V  
 High temperature soldering guaranteed:  
 260°C / 10 seconds at terminals  
 Plastic package has Underwriters Laboratory Flammability Classification 94V-0

### SMA/DO-214AC



Dimensions in inches and (millimeters)

### MECHANICAL DATA

Case: Molded plastic over passivated junction  
 Terminals: Pure tin plated lead free, solderable per MIL-STD-750, Method 2025  
 Polarity: Color Band denotes positive end (cathode)  
 Standard packaging: 12mm tape (EIA-481)  
 Weight: 0.002 ounces, 0.064 gram



**Pb-free; RoHS-compliant**

### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

(Ratings at 25 °C ambient temperature unless otherwise specified.)

| Type Number                                                                                                   | Symbol         | Value        | Units          |
|---------------------------------------------------------------------------------------------------------------|----------------|--------------|----------------|
| Peak Power Dissipation at $T_A=50^\circ\text{C}$ , Derate above $50^\circ\text{C}$ ( Note 1 )                 | $P_D$          | 1.0<br>6.67  | Watts<br>mW/°C |
| Peak Forward Surge Current, 8.3 ms Single Half Sine-wave Superimposed on Rated Load (JEDEC method) ( Note 2 ) | $I_{FSM}$      | 10.0         | Amps           |
| Operating and Storage Temperature Range                                                                       | $T_J, T_{STG}$ | -55 to + 150 | °C             |

Notes: 1. Mounted on 5.0mm<sup>2</sup> (0.013mm thick) land areas.  
 2. Measured on 8.3ms Single Half Sine-wave or Equivalent Square Wave, Duty Cycle=4 Pulses Per Minute Maximum

## ELECTRICAL CHARACTERISTICS

(TA=25 °C unless otherwise noted) VF=1.2V max, IF=200mA for all types.

| Device<br>(Note 1) | Device<br>Marking<br>Code | Nominal Zener Voltage<br>Vz @ Izt<br>Voltage<br>(Notes 2 & 3) | Test<br>Current<br>Izt<br>mA | Maximum Zener Impedance (Note 4) |           |      | Leakage Current |       | Surge Current @<br>TA = 25°C<br>Ir - mA<br>(Note 5) |
|--------------------|---------------------------|---------------------------------------------------------------|------------------------------|----------------------------------|-----------|------|-----------------|-------|-----------------------------------------------------|
|                    |                           |                                                               |                              | ZZT @ IZT<br>Ohms                | ZZK @ IZK |      | IR @ VR         |       |                                                     |
|                    |                           |                                                               |                              |                                  | Ohms      | mA   | uA Max          | Volts |                                                     |
| 1SMA4741           | 741A                      | 11                                                            | 23                           | 8                                | 700       | 0.25 | 5.0             | 8.4   | 414                                                 |
| 1SMA4742           | 742A                      | 12                                                            | 21                           | 9                                | 700       | 0.25 | 5.0             | 9.1   | 380                                                 |
| 1SMA4743           | 743A                      | 13                                                            | 19                           | 10                               | 700       | 0.25 | 5.0             | 9.9   | 344                                                 |
| 1SMA4744           | 744A                      | 15                                                            | 17                           | 14                               | 700       | 0.25 | 5.0             | 11.4  | 304                                                 |
| 1SMA4745           | 745A                      | 16                                                            | 15.5                         | 16                               | 700       | 0.25 | 5.0             | 12.2  | 285                                                 |
| 1SMA4746           | 746A                      | 18                                                            | 14.0                         | 20                               | 750       | 0.25 | 5.0             | 13.7  | 250                                                 |
| 1SMA4747           | 747A                      | 20                                                            | 12.5                         | 22                               | 750       | 0.25 | 5.0             | 15.2  | 225                                                 |
| 1SMA4748           | 748A                      | 22                                                            | 11.5                         | 23                               | 750       | 0.25 | 5.0             | 16.7  | 205                                                 |
| 1SMA4749           | 749A                      | 24                                                            | 10.5                         | 25                               | 750       | 0.25 | 5.0             | 18.2  | 190                                                 |
| 1SMA4750           | 750A                      | 27                                                            | 9.5                          | 35                               | 750       | 0.25 | 5.0             | 20.6  | 170                                                 |
| 1SMA4751           | 751A                      | 30                                                            | 8.5                          | 40                               | 1000      | 0.25 | 5.0             | 22.8  | 150                                                 |
| 1SMA4752           | 752A                      | 33                                                            | 7.5                          | 45                               | 1000      | 0.25 | 5.0             | 25.1  | 135                                                 |
| 1SMA4753           | 753A                      | 36                                                            | 7.0                          | 50                               | 1000      | 0.25 | 5.0             | 27.4  | 125                                                 |
| 1SMA4754           | 754A                      | 39                                                            | 6.5                          | 60                               | 1000      | 0.25 | 5.0             | 29.7  | 115                                                 |
| 1SMA4755           | 755A                      | 43                                                            | 6.0                          | 70                               | 1500      | 0.25 | 5.0             | 32.7  | 110                                                 |
| 1SMA4756           | 756A                      | 47                                                            | 5.5                          | 80                               | 1500      | 0.25 | 5.0             | 35.8  | 95                                                  |
| 1SMA4757           | 757A                      | 51                                                            | 5.0                          | 95                               | 1500      | 0.25 | 5.0             | 38.8  | 90                                                  |
| 1SMA4758           | 758A                      | 56                                                            | 4.5                          | 110                              | 2000      | 0.25 | 5.0             | 42.6  | 80                                                  |
| 1SMA4759           | 759A                      | 62                                                            | 4.0                          | 125                              | 2000      | 0.25 | 5.0             | 47.1  | 70                                                  |
| 1SMA4760           | 760A                      | 68                                                            | 3.7                          | 150                              | 2000      | 0.25 | 5.0             | 51.7  | 65                                                  |
| 1SMA4761           | 761A                      | 75                                                            | 3.3                          | 175                              | 2000      | 0.25 | 5.0             | 56.0  | 60                                                  |
| 1SMA4762           | 762A                      | 82                                                            | 3.0                          | 200                              | 3000      | 0.25 | 5.0             | 62.2  | 55                                                  |
| 1SMA4763           | 763A                      | 91                                                            | 2.8                          | 250                              | 3000      | 0.25 | 5.0             | 69.2  | 50                                                  |
| 1SMA4764           | 764A                      | 100                                                           | 2.5                          | 350                              | 3000      | 0.25 | 5.0             | 76.0  | 45                                                  |
| 1SMA110Z           | 110A                      | 110                                                           | 2.3                          | 450                              | 4000      | 0.25 | 5.0             | 83.6  | -                                                   |
| 1SMA120Z           | 120A                      | 120                                                           | 2.0                          | 550                              | 4500      | 0.25 | 5.0             | 91.2  | -                                                   |
| 1SMA130Z           | 130A                      | 130                                                           | 1.9                          | 700                              | 5000      | 0.25 | 5.0             | 98.8  | -                                                   |
| 1SMA150Z           | 150A                      | 150                                                           | 1.7                          | 1000                             | 6000      | 0.25 | 5.0             | 114.0 | -                                                   |
| 1SMA160Z           | 160A                      | 160                                                           | 1.6                          | 1100                             | 6500      | 0.25 | 5.0             | 121.6 | -                                                   |
| 1SMA180Z           | 180A                      | 180                                                           | 1.4                          | 1200                             | 7000      | 0.25 | 5.0             | 136.8 | -                                                   |
| 1SMA200Z           | 200A                      | 200                                                           | 1.2                          | 1500                             | 8000      | 0.25 | 5.0             | 152.0 | -                                                   |

- 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 (VZ) Measurement. Guarantees the zener voltage when measured at 90 seconds while maintaining the lead temperature (TL) at  $30^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , from the diode body.
4. Zener Impedance (ZZ) Derivation. The zener impedance is derived from the 60 cycle ac voltage, which results when an ac current having and rms value equal to 10% of the dc zener current (IZT or IZK) is superimposed on IZT or IZK.
5. Surge Current (Ir) 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, IZT, per JEDEC registration; however, actual device capability is as described in Figure 10.

## RATINGS AND CHARACTERISTIC CURVES (1SMA4741 THRU 1SMA200Z)

FIG.1- POWER TEMPERATURE DERATING CURVE

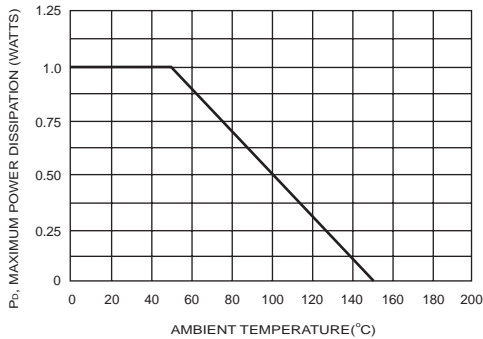


FIG.2- TYPICAL FORWARD CHARACTERISTICS

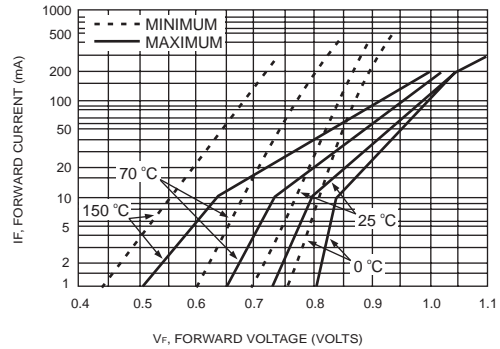


FIG.3- EFFECT OF ZENER CURRENT ON ZENER IMPEDANCE

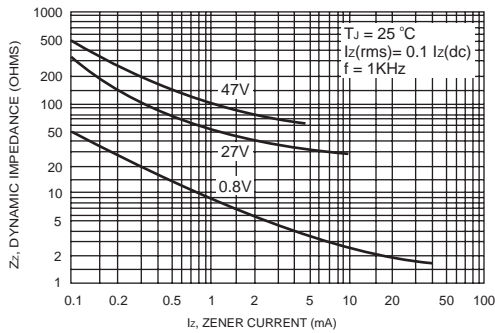


FIG.4- EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

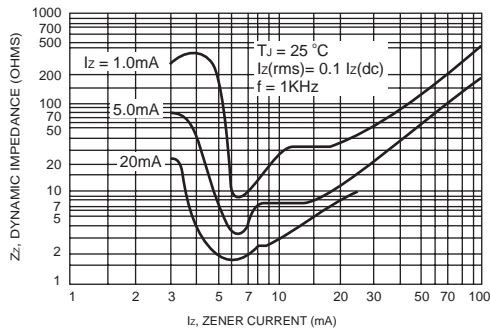
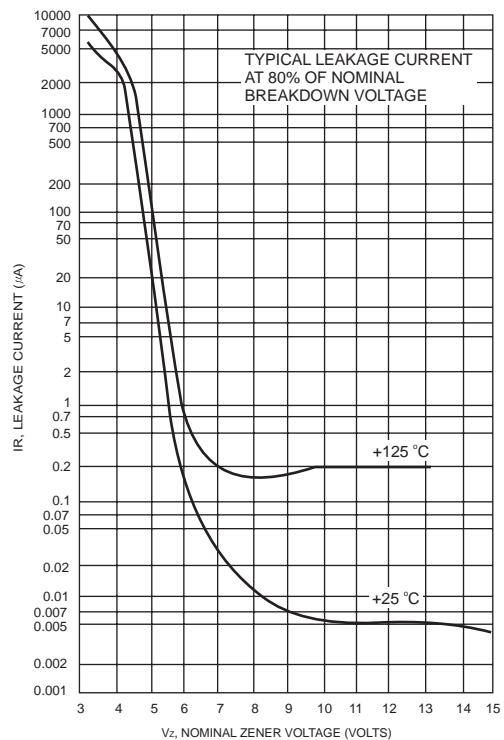


FIG.5- TYPICAL LEAKAGE CURRENT



## RATINGS AND CHARACTERISTIC CURVES (1SMA4741 THRU 1SMA200Z)

FIG.6- TYPICAL CAPACITANCE versus  $V_z$

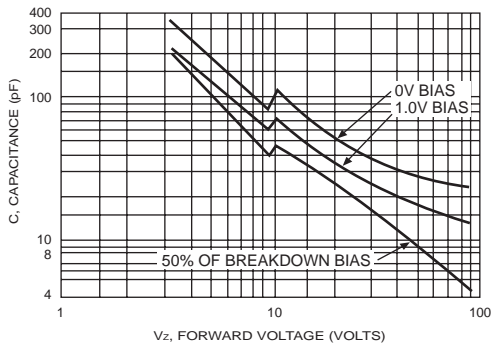


FIG.7- TEMPERATURE COEFFICIENTS

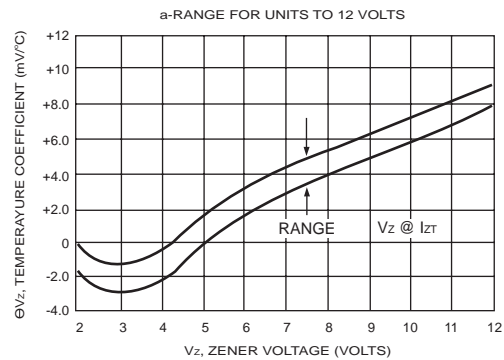


FIG.8- TEMPERATURE COEFFICIENTS

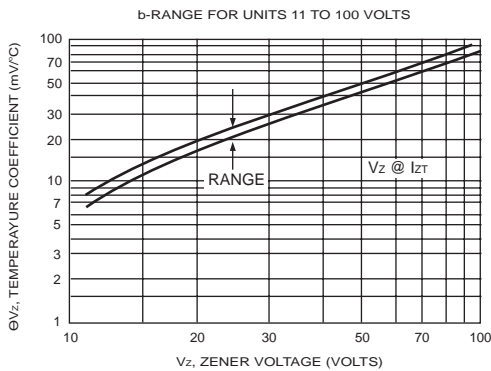


FIG.9- EFFECT OF ZENER CURRENT

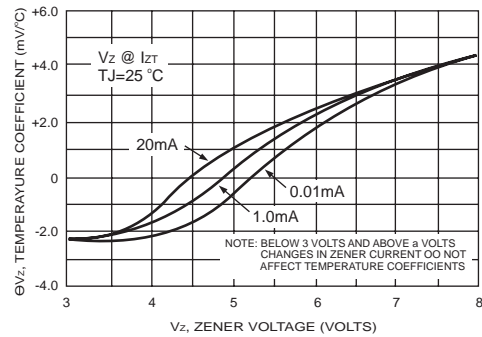
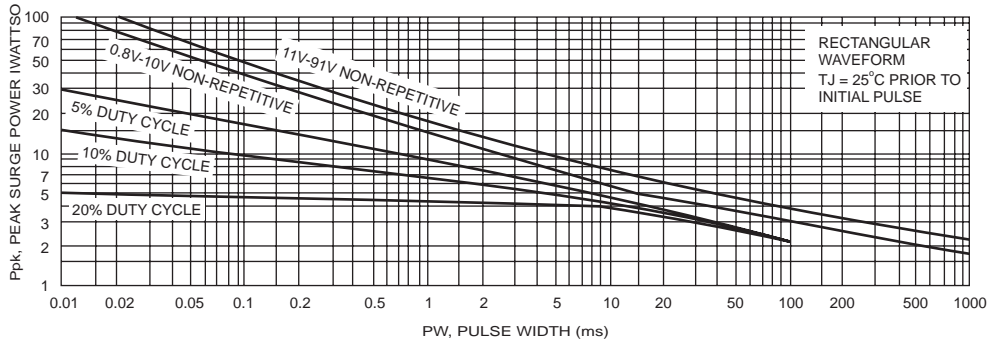


FIG.10- MAXIMUM SURGE POWER



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