

## SMAG Plastic-Encapsulate Diodes

### Zener Diodes

#### Features

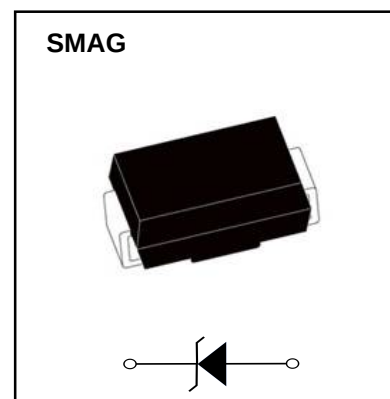
- $P_d$  3W
- $V_z$  3.3V-200V
- Range 5%

#### Applications

- Stabilizing Voltage

#### Mechical Data

- Case: JEDEC DO-214AC molded plastic
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Solder plated, solderable per MIL-STD-202, Method 208
- Polarity: Color band denotes cathode end



#### Limiting Values (Absolute Maximum Rating)

| Item                         | Symbol    | Unit               | Conditions               | Max         |
|------------------------------|-----------|--------------------|--------------------------|-------------|
| Power dissipation            | $P_d$     | W                  | $T_L=75^{\circ}\text{C}$ | 3.0         |
| Zener current                | $I_z$     | mA                 |                          | $P_v / V_z$ |
| Maximum junction temperature | $T_j$     | $^{\circ}\text{C}$ |                          | -65 to +150 |
| Storage temperature range    | $T_{stg}$ | $^{\circ}\text{C}$ |                          | -65 to +150 |
| Forward voltage              | $V_F$     | V                  | $I_F=200\text{mA}$       | 1.2         |

#### Electrical Characteristics ( $T_a=25^{\circ}\text{C}$ Unless otherwise specified)

| Item               | Symbol          | Unit                 | Conditions                  | Max |
|--------------------|-----------------|----------------------|-----------------------------|-----|
| Thermal resistance | $R_{\theta JA}$ | $^{\circ}\text{C/W}$ | Between junction to ambient | 75  |
|                    | $R_{\theta JL}$ | $^{\circ}\text{C/W}$ | Between junction to lead    | 25  |

#### Notes:

Thermal resistance from junction to ambient and from junction to lead mounted on FR4 PCB double sided copper mini pad

**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

| Part Number | Nominal Zener Voltage            |                 | Maximum Zener Impedance           |                                   |                 | Maximum Reverse Leakage Current |       | Maximum DC Zener Current |
|-------------|----------------------------------|-----------------|-----------------------------------|-----------------------------------|-----------------|---------------------------------|-------|--------------------------|
|             | V <sub>Z</sub> @ I <sub>ZT</sub> | I <sub>ZT</sub> | Z <sub>ZT</sub> @ I <sub>ZT</sub> | Z <sub>ZK</sub> @ I <sub>ZK</sub> | I <sub>ZK</sub> | I <sub>R</sub> @ V <sub>R</sub> |       | I <sub>ZM</sub>          |
|             | (V)                              | (mA)            | (Ω)                               | (Ω)                               | (mA)            | (μA)                            | (V)   | (mA)                     |
| SMA5913B    | 3.3                              | 227.3           | 10.0                              | 500                               | 1.00            | 100.0                           | 1.0   | 817                      |
| SMA5914B    | 3.6                              | 208.3           | 9.0                               | 500                               | 1.00            | 75.0                            | 1.0   | 749                      |
| SMA5915B    | 3.9                              | 192.0           | 4.5                               | 400                               | 1.00            | 50.0                            | 1.0   | 691                      |
| SMA5916B    | 4.3                              | 174.0           | 4.5                               | 400                               | 1.00            | 30.0                            | 1.0   | 627                      |
| SMA5917B    | 4.7                              | 160.0           | 4.0                               | 500                               | 1.00            | 20.0                            | 1.0   | 573                      |
| SMA5918B    | 5.1                              | 147.0           | 3.5                               | 550                               | 1.00            | 5.0                             | 1.0   | 528                      |
| SMA5919B    | 5.6                              | 134.0           | 2.5                               | 600                               | 1.00            | 5.0                             | 2.0   | 481                      |
| SMA5920B    | 6.2                              | 121.0           | 1.5                               | 700                               | 1.00            | 5.0                             | 3.0   | 435                      |
| SMA5921B    | 6.8                              | 110.0           | 2.0                               | 700                               | 1.00            | 5.0                             | 4.0   | 393                      |
| SMA5922B    | 7.5                              | 100.0           | 2.0                               | 700                               | 0.50            | 5.0                             | 5.0   | 360                      |
| SMA5923B    | 8.2                              | 91.0            | 2.3                               | 700                               | 0.50            | 5.0                             | 6.0   | 330                      |
| SMA5924B    | 9.1                              | 82.0            | 2.5                               | 700                               | 0.50            | 3.0                             | 7.0   | 297                      |
| SMA5925B    | 10.0                             | 75.0            | 3.5                               | 700                               | 0.25            | 3.0                             | 7.6   | 270                      |
| SMA5926B    | 11.0                             | 68.0            | 4.0                               | 700                               | 0.25            | 1.0                             | 8.4   | 225                      |
| SMA5927B    | 12.0                             | 63.0            | 4.5                               | 700                               | 0.25            | 1.0                             | 9.1   | 246                      |
| SMA5928B    | 13.0                             | 58.0            | 4.5                               | 700                               | 0.25            | 0.5                             | 9.9   | 208                      |
| SMA5929B    | 15.0                             | 50.0            | 5.5                               | 700                               | 0.25            | 0.5                             | 11.4  | 180                      |
| SMA5930B    | 16.0                             | 47.0            | 5.5                               | 700                               | 0.25            | 0.5                             | 12.2  | 169                      |
| SMA5931B    | 18.0                             | 42.0            | 6.0                               | 750                               | 0.25            | 0.5                             | 13.7  | 150                      |
| SMA5932B    | 20.0                             | 37.0            | 7.0                               | 750                               | 0.25            | 0.5                             | 15.2  | 135                      |
| SMA5933B    | 22.0                             | 34.0            | 8.0                               | 750                               | 0.25            | 0.5                             | 16.7  | 123                      |
| SMA5934B    | 24.0                             | 31.0            | 9.0                               | 750                               | 0.25            | 0.5                             | 18.2  | 112                      |
| SMA5935B    | 27.0                             | 28.0            | 10.0                              | 750                               | 0.25            | 0.5                             | 20.6  | 100                      |
| SMA5936B    | 30.0                             | 25.0            | 16.0                              | 1000                              | 0.25            | 0.5                             | 22.5  | 90                       |
| SMA5937B    | 33.0                             | 23.0            | 20.0                              | 1000                              | 0.25            | 0.5                             | 25.1  | 82                       |
| SMA5938B    | 36.0                             | 21.0            | 22.0                              | 1000                              | 0.25            | 0.5                             | 27.4  | 75                       |
| SMA5939B    | 39.0                             | 19.0            | 28.0                              | 1000                              | 0.25            | 0.5                             | 29.7  | 69                       |
| SMA5940B    | 43.0                             | 17.0            | 33.0                              | 1500                              | 0.25            | 0.5                             | 32.7  | 63                       |
| SMA5941B    | 47.0                             | 16.0            | 38.0                              | 1500                              | 0.25            | 0.5                             | 35.6  | 57                       |
| SMA5942B    | 51.0                             | 15.0            | 45.0                              | 1500                              | 0.25            | 0.5                             | 38.8  | 53                       |
| SMA5943B    | 56.0                             | 13.0            | 50.0                              | 2000                              | 0.25            | 0.5                             | 42.6  | 48                       |
| SMA5944B    | 62.0                             | 12.0            | 55.0                              | 2000                              | 0.25            | 0.5                             | 47.1  | 44                       |
| SMA5945B    | 68.0                             | 11.0            | 70.0                              | 2000                              | 0.25            | 0.5                             | 51.7  | 40                       |
| SMA5946B    | 75.0                             | 10.0            | 85.0                              | 2000                              | 0.25            | 0.5                             | 56.0  | 36                       |
| SMA5947B    | 82.0                             | 9.1             | 95.0                              | 3000                              | 0.25            | 0.5                             | 62.2  | 33                       |
| SMA5948B    | 91.0                             | 8.2             | 115                               | 3000                              | 0.25            | 0.5                             | 69.2  | 30                       |
| SMA5949B    | 100.0                            | 7.5             | 160                               | 3000                              | 0.25            | 0.5                             | 76.0  | 27                       |
| SMA5950B    | 110.0                            | 6.8             | 225                               | 4000                              | 0.25            | 0.5                             | 83.6  | 25                       |
| SMA5951B    | 120.0                            | 6.3             | 300                               | 4500                              | 0.25            | 0.5                             | 91.2  | 22                       |
| SMA5952B    | 130.0                            | 5.8             | 375                               | 5000                              | 0.25            | 0.5                             | 98.8  | 21                       |
| SMA5953B    | 150.0                            | 5.0             | 550                               | 6000                              | 0.25            | 0.5                             | 114.0 | 18                       |
| SMA5954B    | 160.0                            | 2.3             | 700.0                             | 6500                              | 0.25            | 0.5                             | 121.6 | 9                        |
| SMA5955B    | 180.0                            | 2.1             | 900.0                             | 7000                              | 0.25            | 0.5                             | 136.8 | 8                        |
| SMA5956B    | 200.0                            | 1.9             | 1200.0                            | 8000                              | 0.25            | 0.5                             | 152.0 | 7                        |

**Notes :**

- (1) The type number listed have a standard tolerance on the nominal zener voltage of  $\pm 5\%$
- (2) The reverse surge current is a non-repetitive, 8.3ms pulse width square wave or equivalent sine-wave superimposed on I<sub>ZT</sub> per method.

## Typical Characteristics

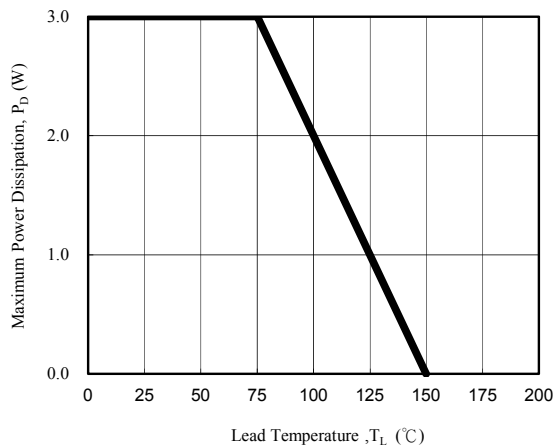


Fig. 1 - Power Temperature Derating Curve

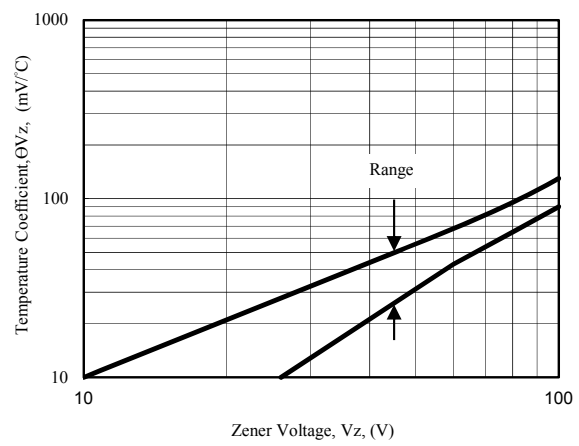


Fig. 2 - Temperature Coefficients v.s. Zener Voltage

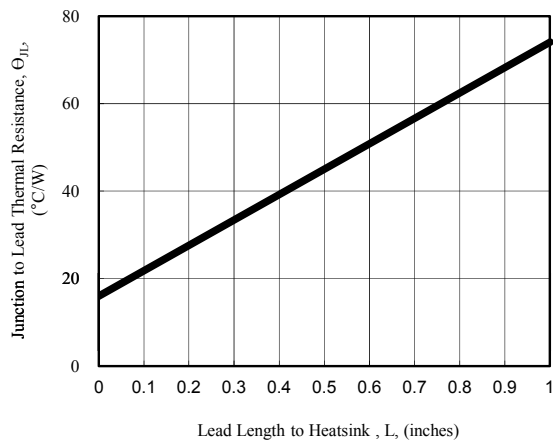


Fig. 3 - Typical Thermal Resistance v.s. Lead Length

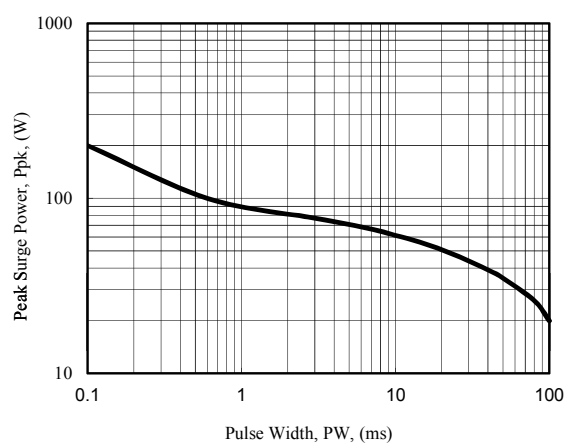


Fig. 4 - Maximum Surge Power

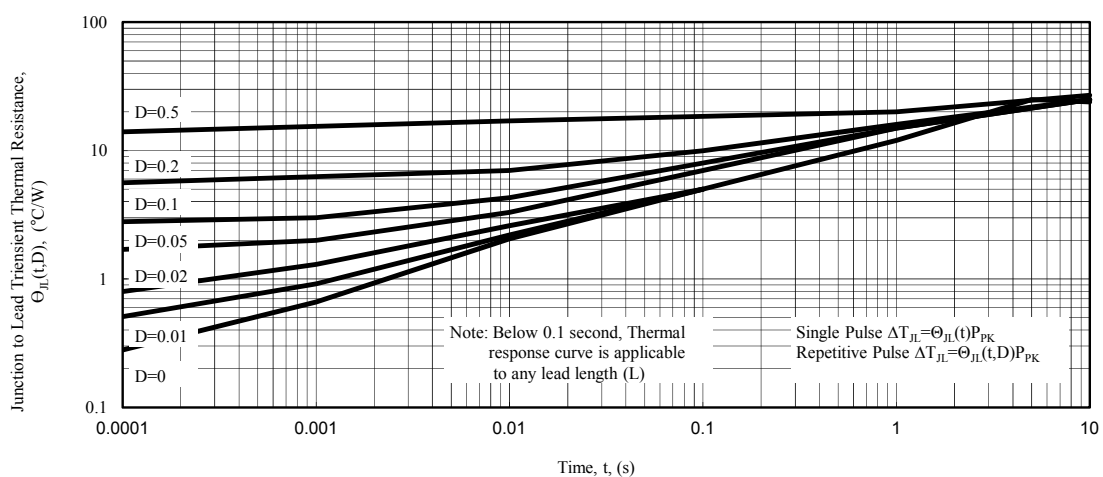
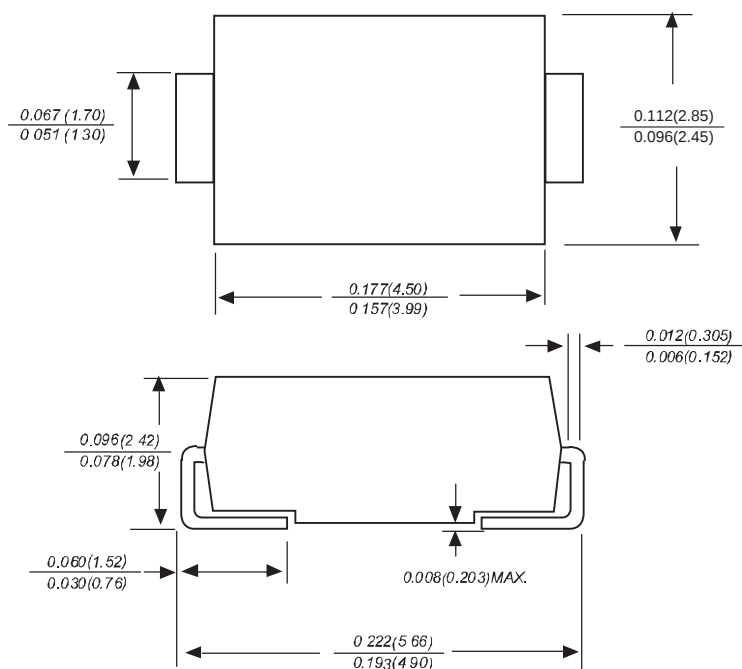


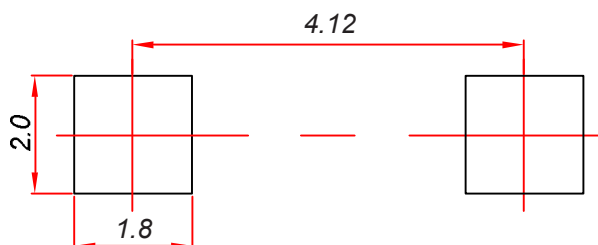
Fig. 5 - Typical Thermal Response L, Lead Length=3/8inch

## SMAG Package Outline Dimensions



Dimensions in inches and (millimeters)

## SMAG Suggested Pad Layout



### Note:

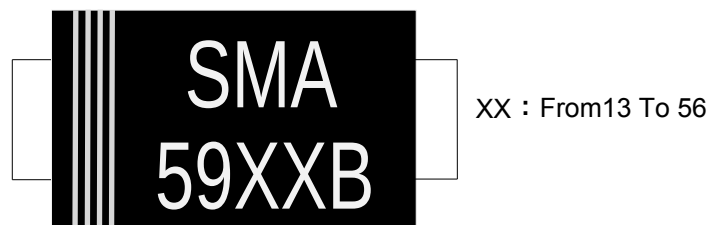
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$ mm.
3. The pad layout is for reference purposes only.

XX : From 27 To 64 (Vz<100V)

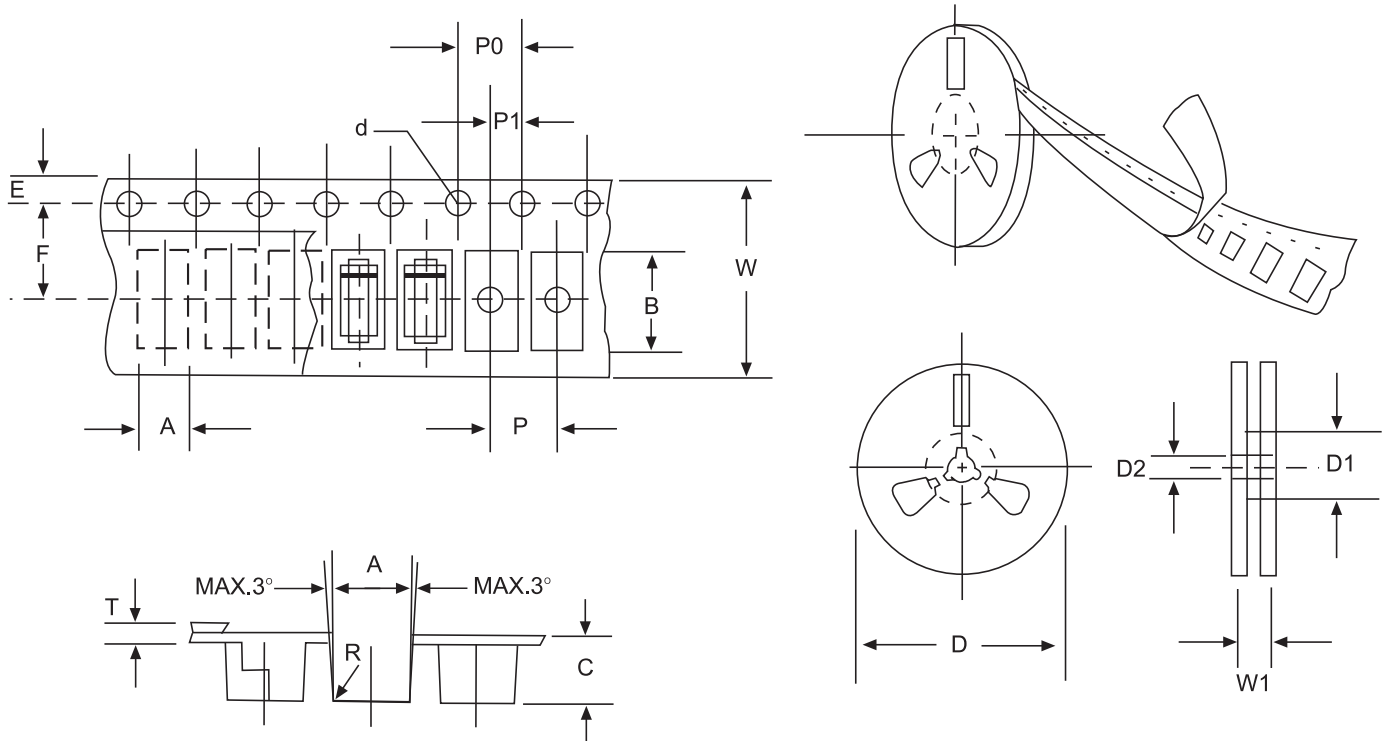
## Ordering Information

| Part Number           | Package | Shipping Quantity |
|-----------------------|---------|-------------------|
| SMA5913B<br>-SMA5956B | SMAG    | 5000/tape&Reel    |

## Marking Diagram



## Reel Taping Specifications For Surface Mount Devices- SMAG



**FIG: CONFIGURATION OF SURFACE MOUNTED DEVICES TAPING**

| ITEM                   | SYMBOL | SMAG mm(inch)             |
|------------------------|--------|---------------------------|
| Carrier width          | A      | 2.79±0.1(0.110±0.004)     |
| Carrier length         | B      | 5.33±0.1(0.210±0.004)     |
| Carrier depth          | C      | 2.36±0.1(0.093±0.004)     |
| Sprocket hole          | d      | 1.55±0.05 (0.061±0.002)   |
| Reel outside diameter  | D      | 279±2.0 (11± 0.079)       |
| Reel inner diameter    | D1     | 75 ±1.0 ( 2.95 ±0.039)    |
| Feed hole diameter     | D2     | 13±0.5(0.512±0.020)       |
| Sprocket hole position | E      | 1.75±0.1(0.069±0.004)     |
| Punch hole position    | F      | 5.5±0.05(0.217±0.002)     |
| Punch hole pitch       | P      | 4.0±0.1(0.157±0.004)      |
| Sprocket hole pitch    | P0     | 4.0±0.1(0.157±0.004)      |
| Embossment center      | P1     | 2.0±0.1(0.079±0.004)      |
| Total tape thickness   | T      | 0.28±0.02(0.011 ±0.0008 ) |
| Tape width             | W      | 12.0±0.2(0.472±0.008)     |
| Reel width             | W1     | 16.8±2.0(0.661±0.079)     |

NOTE: Devices are packed in accordance with EIA standard RS-481-A and specification given above.