

# SMAJ5913B THRU SMAJ5956B

## SILICON 3.0 WATT ZENER DIODES

### Features

- For Surface Mount Applications (flat handling surface for accurate placement)
- Zener Voltage 3.3V to 200V
- Withstands Large Surge Stresses
- Electrically Equivalent to JEDEC Registered Series IN5913 through IN5956
- Available on Tape and Reel
- High Surge Current Rating

### Mechanical Data

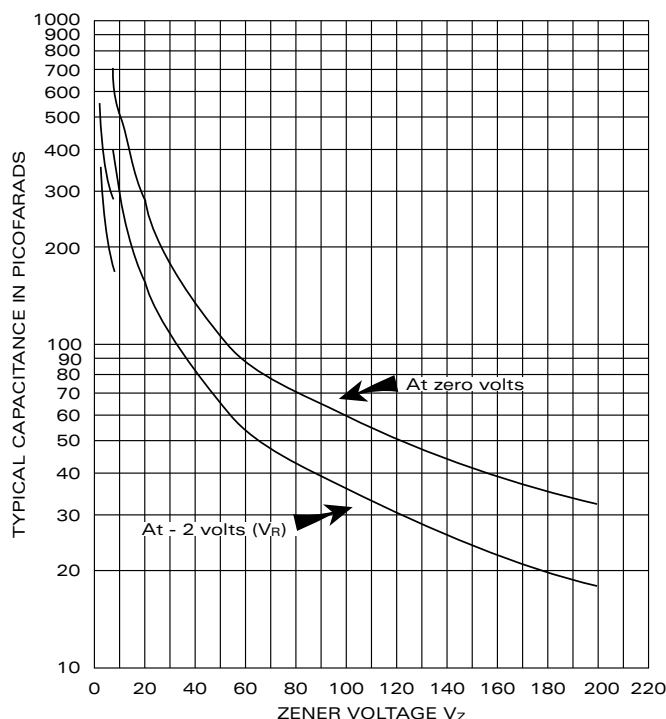
- Package similar to JEDEC DO-214AC (see dimension 'A' note)
- Terminals solderable per MIL-STD-750, Method 2026
- Polarity is indicated by cathode band
- Maximum temperature for soldering: 260°C for 10 seconds
- Plastic surface mount body meets UL94V-0 flame retardent epoxy

### Maximum Ratings @ 25°C (Unless Otherwise Specified)

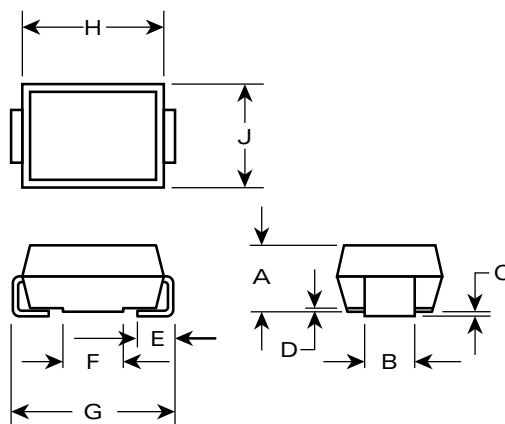
|                                    |                 |                 |           |
|------------------------------------|-----------------|-----------------|-----------|
| Forward Voltage                    | $V_F$           | 1.2V            | Note 1    |
| Peak Pulse Power                   | $P_{PP}$        | See Figure 3    |           |
| Steady State Power Dissipation     | $P_{(AV)}$      | 3.0W            | Note 2, 3 |
| Operating and Storage Temperatures | $T_J, T_{STG}$  | -55°C to +150°C |           |
| Thermal Resistance                 | $R_{\theta JL}$ | 25°C/W          |           |

#### Notes:

1. Forward current at 200mA.
2. Mounted on 4.0mm<sup>2</sup> copper pads to each terminal.
3. Lead temperature at 75°C =  $T_L$ . Derate linearly above 75°C to zero power at 150°C.



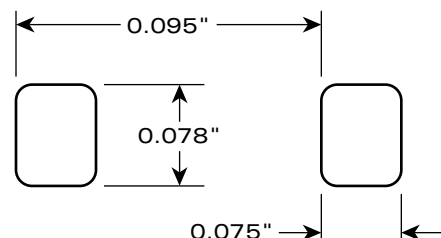
CAPACITANCE vs.  $V_Z$  CURVE



| DIM | INCHES<br>MIN / MAX | MILLIMETERS<br>MIN / MAX | NOTE |
|-----|---------------------|--------------------------|------|
| A   | .078 / .115         | 1.98 / 2.92              | 1    |
| B   | .052 / .058         | 1.32 / 1.47              |      |
| C   | - / .005            | - / .127                 |      |
| D   | - / .02             | - / .51                  |      |
| E   | .030 / .060         | .76 / 1.52               |      |
| F   | .055 / .075         | 1.65 / 2.13              |      |
| G   | .194 / .216         | 4.93 / 5.48              |      |
| H   | .160 / .180         | 3.99 / 4.50              |      |
| J   | .100 / .110         | 2.57 / 2.79              |      |

NOTE 1: THIS MAXIMUM DIMENSION IS LARGER THAN THE STANDARD JEDEC CALL OUT. STANDARD JEDEC IS .105 INCHES OR 2.88 MM.

#### PAD LAYOUT



# Electrical Characteristics @ 25°C

| TYPE<br>NUMBER | ZENER<br>VOLTAGE<br>V <sub>Z</sub> | TEST<br>CURRENT<br>I <sub>ZT</sub> | DYNAMIC<br>IMPEDANCE<br>Z <sub>ZT</sub> | KNEE<br>CURRENT<br>I <sub>ZK</sub> | KNEE<br>IMPEDANCE<br>Z <sub>ZK</sub> | REVERSE<br>CURRENT<br>I <sub>R</sub> (MAX.) | REVERSE<br>VOLTAGE<br>V <sub>R</sub> | MAX.DC<br>CURRENT<br>I <sub>ZM</sub> |
|----------------|------------------------------------|------------------------------------|-----------------------------------------|------------------------------------|--------------------------------------|---------------------------------------------|--------------------------------------|--------------------------------------|
|                | VOLTS                              | mA                                 | Ω                                       | mA                                 | Ω                                    | μAdc                                        | VOLTS                                | mA                                   |
| SMAJ5913       | 3.3                                | 113.6                              | 10                                      | 1.0                                | 500                                  | 100                                         | 1.0                                  | 908                                  |
| SMAJ5914       | 3.6                                | 104.2                              | 9.0                                     | 1.0                                | 500                                  | 75                                          | 1.0                                  | 832                                  |
| SMAJ5915       | 3.9                                | 96.1                               | 7.5                                     | 1.0                                | 500                                  | 25                                          | 1.0                                  | 768                                  |
| SMAJ5916       | 4.3                                | 87.2                               | 6.0                                     | 1.0                                | 500                                  | 5.0                                         | 1.0                                  | 696                                  |
| SMAJ5917       | 4.7                                | 79.8                               | 5.0                                     | 1.0                                | 500                                  | 5.0                                         | 1.5                                  | 638                                  |
| SMAJ5918       | 5.1                                | 73.5                               | 4.0                                     | 1.0                                | 350                                  | 5.0                                         | 2.0                                  | 588                                  |
| SMAJ5919       | 5.6                                | 66.9                               | 2.0                                     | 1.0                                | 250                                  | 5.0                                         | 3.0                                  | 534                                  |
| SMAJ5920       | 6.2                                | 60.5                               | 2.0                                     | 1.0                                | 200                                  | 5.0                                         | 4.0                                  | 482                                  |
| SMAJ5921       | 6.8                                | 55.1                               | 2.5                                     | 1.0                                | 200                                  | 5.0                                         | 5.2                                  | 440                                  |
| SMAJ5922       | 7.5                                | 50                                 | 3.0                                     | 0.5                                | 400                                  | 5.0                                         | 6.0                                  | 400                                  |
| SMAJ5923       | 8.2                                | 45.7                               | 3.5                                     | 0.5                                | 400                                  | 5.0                                         | 6.5                                  | 364                                  |
| SMAJ5924       | 9.1                                | 41.2                               | 4.0                                     | 0.5                                | 500                                  | 5.0                                         | 7.0                                  | 328                                  |
| SMAJ5925       | 10                                 | 37.5                               | 4.5                                     | 0.25                               | 500                                  | 5.0                                         | 8.0                                  | 300                                  |
| SMAJ5926       | 11                                 | 34.1                               | 5.5                                     | 0.25                               | 550                                  | 1.0                                         | 8.4                                  | 272                                  |
| SMAJ5927       | 12                                 | 31.2                               | 6.5                                     | 0.25                               | 550                                  | 1.0                                         | 9.1                                  | 250                                  |
| SMAJ5928       | 13                                 | 28.8                               | 7.0                                     | 0.25                               | 550                                  | 1.0                                         | 9.9                                  | 230                                  |
| SMAJ5929       | 15                                 | 25                                 | 9.0                                     | 0.25                               | 600                                  | 1.0                                         | 11.4                                 | 200                                  |
| SMAJ5930       | 16                                 | 23.4                               | 10                                      | 0.25                               | 600                                  | 1.0                                         | 12.2                                 | 186                                  |
| SMAJ5931       | 18                                 | 20.8                               | 12                                      | 0.25                               | 650                                  | 1.0                                         | 13.7                                 | 166                                  |
| SMAJ5932       | 20                                 | 18.7                               | 14                                      | 0.25                               | 650                                  | 1.0                                         | 15.2                                 | 150                                  |
| SMAJ5933       | 22                                 | 17                                 | 17.5                                    | 0.25                               | 650                                  | 1.0                                         | 16.7                                 | 156                                  |
| SMAJ5934       | 24                                 | 15.6                               | 19                                      | 0.25                               | 700                                  | 1.0                                         | 18.2                                 | 124                                  |
| SMAJ5935       | 27                                 | 13.9                               | 23                                      | 0.25                               | 700                                  | 1.0                                         | 20.6                                 | 110                                  |
| SMAJ5936       | 30                                 | 12.5                               | 28                                      | 0.25                               | 750                                  | 1.0                                         | 22.8                                 | 100                                  |
| SMAJ5937       | 33                                 | 11.4                               | 33                                      | 0.25                               | 800                                  | 1.0                                         | 25.1                                 | 90                                   |
| SMAJ5938       | 36                                 | 10.4                               | 38                                      | 0.25                               | 850                                  | 1.0                                         | 27.4                                 | 82                                   |
| SMAJ5939       | 39                                 | 9.6                                | 45                                      | 0.25                               | 900                                  | 1.0                                         | 29.7                                 | 76                                   |
| SMAJ5940       | 43                                 | 8.7                                | 53                                      | 0.25                               | 950                                  | 1.0                                         | 32.7                                 | 68                                   |
| SMAJ5941       | 47                                 | 8.0                                | 67                                      | 0.25                               | 1000                                 | 1.0                                         | 35.8                                 | 62                                   |
| SMAJ5942       | 51                                 | 7.3                                | 70                                      | 0.25                               | 1100                                 | 1.0                                         | 38.8                                 | 58                                   |
| SMAJ5943       | 56                                 | 6.7                                | 86                                      | 0.25                               | 1300                                 | 1.0                                         | 42.6                                 | 52                                   |
| SMAJ5944       | 62                                 | 6.0                                | 100                                     | 0.25                               | 1500                                 | 1.0                                         | 47.1                                 | 48                                   |
| SMAJ5945       | 68                                 | 5.5                                | 120                                     | 0.25                               | 1700                                 | 1.0                                         | 51.2                                 | 44                                   |
| SMAJ5946       | 75                                 | 5.0                                | 140                                     | 0.25                               | 2000                                 | 1.0                                         | 56                                   | 40                                   |
| SMAJ5947       | 82                                 | 4.6                                | 160                                     | 0.25                               | 2500                                 | 1.0                                         | 62.2                                 | 36                                   |
| SMAJ5948       | 91                                 | 4.1                                | 200                                     | 0.25                               | 3000                                 | 1.0                                         | 69.2                                 | 32                                   |
| SMAJ5949       | 100                                | 3.7                                | 250                                     | 0.25                               | 3100                                 | 1.0                                         | 76                                   | 30                                   |
| SMAJ5950       | 110                                | 3.4                                | 300                                     | 0.25                               | 4000                                 | 1.0                                         | 83.6                                 | 26                                   |
| SMAJ5951       | 120                                | 3.1                                | 380                                     | 0.25                               | 4500                                 | 1.0                                         | 91.2                                 | 24                                   |
| SMAJ5952       | 130                                | 2.9                                | 450                                     | 0.25                               | 5000                                 | 1.0                                         | 98.8                                 | 22                                   |
| SMAJ5953       | 150                                | 2.5                                | 600                                     | 0.25                               | 6000                                 | 1.0                                         | 114                                  | 20                                   |
| SMAJ5954       | 160                                | 2.3                                | 700                                     | 0.25                               | 6500                                 | 1.0                                         | 121.6                                | 18                                   |
| SMAJ5955       | 180                                | 2.1                                | 900                                     | 0.25                               | 7000                                 | 1.0                                         | 136.8                                | 16                                   |
| SMAJ5956       | 200                                | 1.9                                | 1200                                    | 0.25                               | 8000                                 | 1.0                                         | 152                                  | 14                                   |

- Notes:
1. No suffix indicates a ±20% tolerance on nominal V<sub>Z</sub>. Suffix A denotes a ±10% tolerance, B denotes a ±5% tolerance, C denotes a ±2% tolerance, and D denotes a ±1% tolerance.
  2. Zener voltage (V<sub>Z</sub>) is measured at T<sub>L</sub> = 30°C. Voltage measurement to be performed 90 seconds after application of dc current.
  3. The zener impedance is derived from the 60 Hz ac voltage, which results when an ac current having an rms value equal to 10% of the dc zener current (I<sub>ZT</sub> or I<sub>ZK</sub>) is superimposed on I<sub>ZT</sub> or I<sub>ZK</sub>.

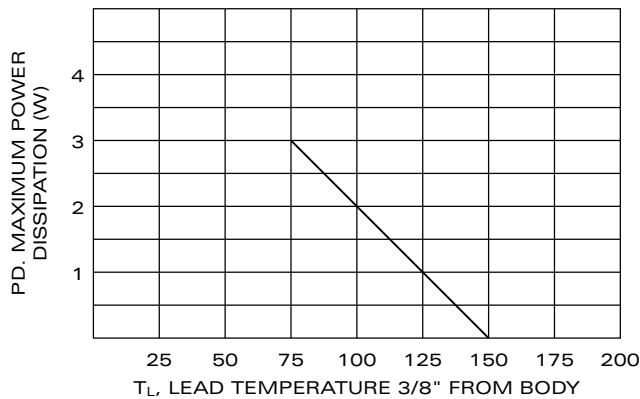


FIGURE 1.  
POWER DERATING CURVE

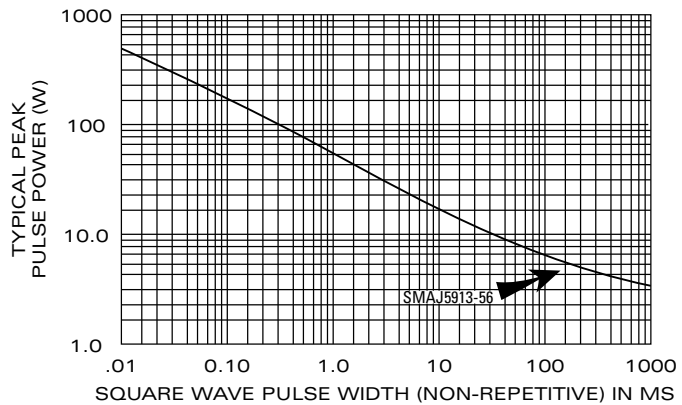


FIGURE 2.  
TRANSIENT SURGE CAPABILITY