

## Features

- 1.0W Power Dissipation
- Ideally Suited for Automated Assembly
- 5.1V - 39V Nominal Zener Voltage Range
- Standard  $V_Z$  Tolerance is  $\pm 5\%$
- **Lead Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: SMA
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Notch or Cathode Band
- Weight: 0.064 grams (Approximate)



Top View



Bottom

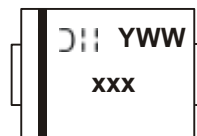
## Ordering Information (Note 4)

| Device*    | Compliance | Packaging | Shipping          |
|------------|------------|-----------|-------------------|
| SMAZx-13-F | Commercial | SMA       | 5,000/Tape & Reel |

\*x = Device Voltage, e.g., SMAZ5V1-13-F.

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



xxx = Product Type Marking Code  
 (See Electric Characteristics Table)  
 = Manufacturers' Code Marking  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 6 for 2016)  
 WW = Week Code (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                          | Symbol          | Value                           | Unit |
|---|-----------------|---------------------------------|------|
| Forward Voltage @I <sub>F</sub> = 200mA | V <sub>F</sub>  | 1.2                             | V    |
| Zener Current                           | I <sub>ZM</sub> | P <sub>D</sub> / V <sub>Z</sub> | mA   |

**Thermal Characteristics**

| Characteristic   | Symbol                            | Value       | Unit  |
|--|-----------------------------------|-------------|-------|
| Power Dissipation @T <sub>A</sub> = +50°C                  | P <sub>D</sub>                    | 1.0         | W     |
| Derate Above +50°C (Note 5)                                |                                   | 10.0        | mW/°C |
| Typical Thermal Resistance – Junction to Terminal (Note 5) | R <sub>θJT</sub>                  | 30          | °C/W  |
| Typical Thermal Resistance – Junction to Ambient (Note 5)  | R <sub>θJA</sub>                  | 100         | °C/W  |
| Operating and Storage Temperature Range                    | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C    |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Type Number | Marking Code | Zener Voltage Range (Note 6)     |         |         | Test Current | Maximum Zener Impedance           |                                   |     | Maximum Reverse Current (Note 6) |      | I <sub>ZM</sub> Max (Note 5) |
|-------------|--------------|----------------------------------|---------|---------|--------------|-----------------------------------|-----------------------------------|-----|----------------------------------|------|------------------------------|
|             |              | V <sub>Z</sub> @ I <sub>ZT</sub> |         |         |              | Z <sub>ZT</sub> @ I <sub>ZT</sub> | Z <sub>ZK</sub> @ I <sub>ZK</sub> |     | I <sub>R</sub> @ V <sub>R</sub>  |      |                              |
|             |              | Nom (V)                          | Min (V) | Max (V) | mA           |                                   | Ω                                 | Ω   | mA                               | μA   | V                            |
| SMAZ5V1     | ZHK          | 5.1                              | 4.84    | 5.40    | 100          | 5.0                               | 500                               | 1.0 | 2.5                              | 1.0  | 196                          |
| SMAZ5V6     | ZHL          | 5.60                             | 5.32    | 5.88    | 100          | 2.0                               | 250                               | 2.0 | 5.0                              | 2.0  | 179                          |
| SMAZ6V2     | ZHN          | 6.20                             | 5.89    | 6.51    | 100          | 2.0                               | 200                               | 2.0 | 5.0                              | 3.0  | 161                          |
| SMAZ6V8     | ZHO          | 6.80                             | 6.46    | 7.14    | 100          | 2.0                               | 200                               | 1.0 | 5.0                              | 4.0  | 147                          |
| SMAZ7V5     | ZHQ          | 7.50                             | 7.13    | 7.88    | 100          | 2.0                               | 450                               | 1.0 | 5.0                              | 5.0  | 133                          |
| SMAZ8V2     | ZHR          | 8.20                             | 7.79    | 8.61    | 100          | 2.0                               | 200                               | 1.0 | 5.0                              | 6.0  | 122                          |
| SMAZ9V1     | ZHT          | 9.10                             | 8.65    | 9.56    | 50           | 4.0                               | 200                               | 1.0 | 5.0                              | 7.0  | 110                          |
| SMAZ10      | ZHU          | 10.00                            | 9.50    | 10.50   | 50           | 4.0                               | 200                               | 1.0 | 1.0                              | 7.6  | 100                          |
| SMAZ12      | ZHW          | 12.00                            | 11.40   | 12.60   | 50           | 7.0                               | 150                               | 1.0 | 1.0                              | 9.1  | 83                           |
| SMAZ15      | ZHZ          | 15.00                            | 14.25   | 15.75   | 50           | 10                                | 150                               | 1.0 | 1.0                              | 11.4 | 67                           |
| SMAZ16      | ZJA          | 16.00                            | 15.20   | 16.80   | 25           | 15                                | 150                               | 1.0 | 0.5                              | 12.2 | 63                           |
| SMAZ18      | ZJF          | 18.00                            | 17.10   | 18.90   | 25           | 15                                | 150                               | 1.0 | 0.5                              | 13.7 | 56                           |
| SMAZ20      | ZJG          | 20.00                            | 19.00   | 21.00   | 25           | 15                                | 180                               | 1.0 | 0.5                              | 15.2 | 50                           |
| SMAZ22      | ZJK          | 22.00                            | 20.90   | 23.10   | 25           | 15                                | 180                               | 1.0 | 0.5                              | 16.7 | 45                           |
| SMAZ24      | ZJL          | 24.00                            | 22.80   | 25.20   | 25           | 15                                | 180                               | 1.0 | 0.5                              | 18.2 | 42                           |
| SMAZ27      | ZJN          | 27.00                            | 25.65   | 28.35   | 25           | 15                                | 200                               | 1.0 | 0.5                              | 20.5 | 37                           |
| SMAZ30      | ZJQ          | 30.00                            | 28.50   | 31.50   | 25           | 15                                | 250                               | 1.0 | 0.5                              | 22.8 | 33                           |
| SMAZ33      | ZJR          | 33.00                            | 31.35   | 34.65   | 25           | 15                                | 300                               | 1.0 | 0.5                              | 25.1 | 30                           |
| SMAZ36      | ZJS          | 36.00                            | 34.20   | 37.80   | 10           | 40                                | 350                               | 1.0 | 0.5                              | 27.4 | 28                           |
| SMAZ39      | ZJT          | 39.00                            | 37.05   | 40.95   | 10           | 40                                | 450                               | 1.0 | 0.5                              | 29.6 | 26                           |

Notes: 5. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc.'s package outlines page, which can be found on our website at <http://www.diodes.com/package-outlines.html>.  
6. Short duration pulse test used to minimize self-heating effect.

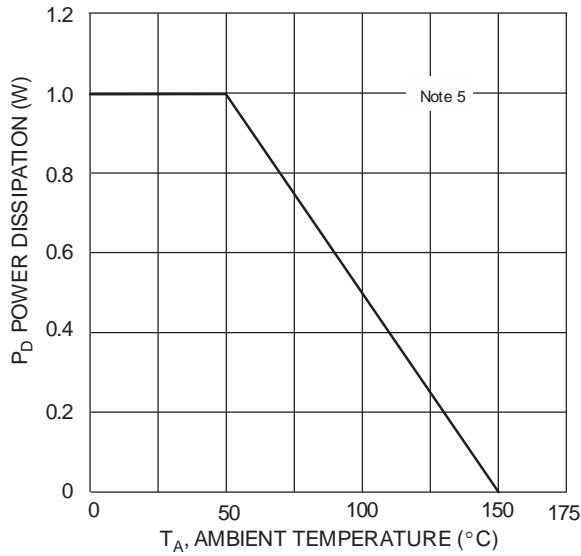


Fig. 1 Power Dissipation vs. Ambient Temperature

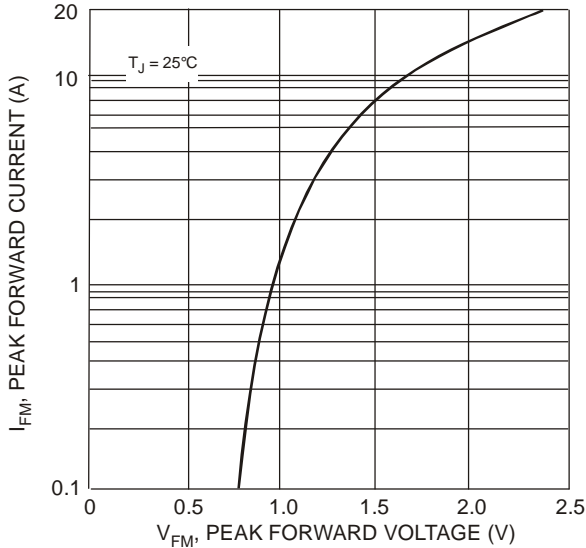


Fig. 3 Peak Forward Current vs. Peak Forward Voltage

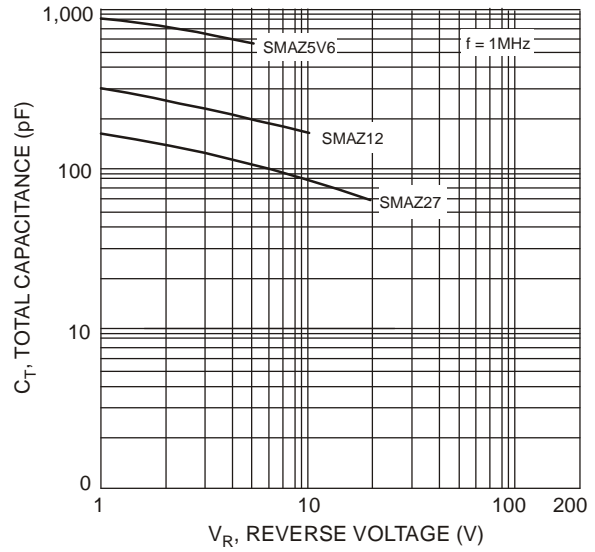


Fig. 2 Typical Total Capacitance vs. Reverse Voltage

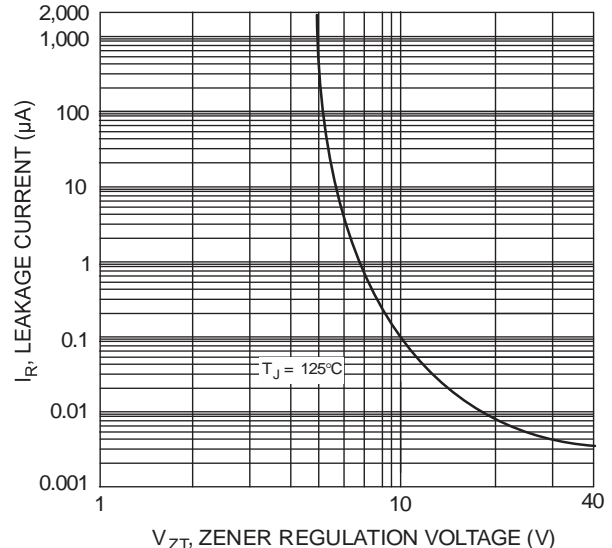


Fig. 4 Leakage Current vs. Regulation Voltage

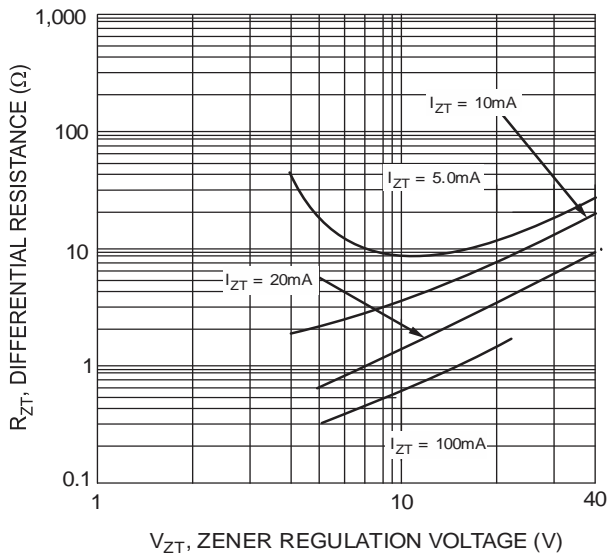
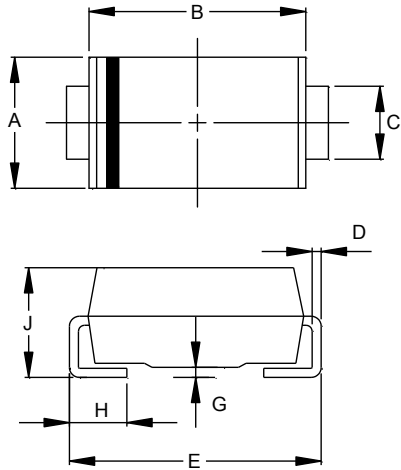


Fig. 5 Differential Resistance vs. Regulation Voltage

**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SMA**

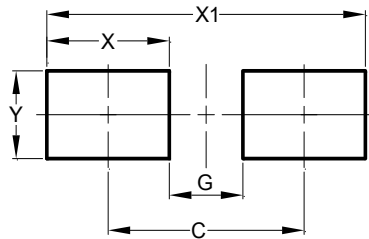


| SMA                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.29 | 2.92 |
| B                    | 4.00 | 4.60 |
| C                    | 1.27 | 1.63 |
| D                    | 0.15 | 0.31 |
| E                    | 4.80 | 5.59 |
| G                    | 0.05 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 1.96 | 2.40 |
| All Dimensions in mm |      |      |

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SMA**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 4.00          |
| G          | 1.50          |
| X          | 2.50          |
| X1         | 6.50          |
| Y          | 1.70          |

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