



**THE DATASHEET OF  
SMAZ5924B-E3/61**





## Surface Mount Power Voltage-Regulating Diodes



SMA (DO-214AC)

### DESIGN SUPPORT TOOLS AVAILABLE



### FEATURES

- Low profile package
- Ideal for automated placement
- Low Zener impedance
- Low regulation factor
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

### TYPICAL APPLICATIONS

For general purpose regulation and protection applications.

### MECHANICAL DATA

**Case:** SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS-compliant and commercial grade

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 1A whisker test

**Polarity:** Color band denotes cathode end

| PRIMARY CHARACTERISTICS                    |               |
|--|---------------|
| V <sub>Z</sub>                             | 5.6 V to 68 V |
| P <sub>tot</sub> at T <sub>L</sub> = 75 °C | 1500 mW       |
| P <sub>tot</sub> at T <sub>A</sub> = 25 °C | 500 mW        |
| T <sub>J</sub> max.                        | 150 °C        |
| V <sub>Z</sub> specification               | Pulse current |
| Circuit configuration                      | Single        |

| MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)                          |                                   |             |      |
|--|-----------------------------------|-------------|------|
| PARAMETER  | SYMBOL                            | VALUE       | UNIT |
| Maximum steady state power dissipation at T <sub>L</sub> = 75 °C (fig. 1) <sup>(1)</sup> | P <sub>tot</sub>                  | 1500        | mW   |
| Maximum steady state power dissipation at T <sub>A</sub> = 25 °C (fig. 1) <sup>(2)</sup> | P <sub>tot</sub>                  | 500         | mW   |
| Maximum instantaneous forward voltage at 200 mA for all types <sup>(3)</sup>             | V <sub>F</sub>                    | 1.5         | V    |
| Operating junction and storage temperature range   | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

### Notes

- <sup>(1)</sup> Mounted on PCB with 5.0 mm x 5.0 mm copper pads attached to each terminal
- <sup>(2)</sup> Mounted on minimum recommended pad layout
- <sup>(3)</sup> Pulse test: 300 μs pulse width, 1 % duty cycle

| ELECTRICAL CHARACTERISTICS |                                     |
|----------------------------|-------------------------------------|
| SYMBOL                     | PARAMETER                           |
| $V_Z$                      | Reverse Zener voltage at $I_{ZT}$   |
| $I_{ZT}$                   | Reverse current                     |
| $Z_{ZT}$                   | Maximum Zener impedance at $I_{ZT}$ |
| $I_{ZK}$                   | Reverse current                     |
| $Z_{ZK}$                   | Maximum Zener impedance at $I_{ZK}$ |
| $I_R$                      | Reverse leakage current at $V_R$    |
| $V_R$                      | Reverse voltage                     |
| $I_F$                      | Forward current                     |
| $V_F$                      | Forward voltage at $I_F$            |
| $I_{ZM}$                   | Maximum DC Zener current            |



Zener Voltage Regulator

| ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                     |                     |      |       |              |          |                         |                      |                         |      |                       |
|---|---------------------|---------------------|------|-------|--------------|----------|-------------------------|----------------------|-------------------------|------|-----------------------|
| PART NUMBER   | DEVICE MARKING CODE | ZENER VOLTAGE RANGE |      |       | TEST CURRENT |          | MAXIMUM ZENER IMPEDANCE |                      | REVERSE LEAKAGE CURRENT |      | MAXIMUM ZENER CURRENT |
|   |                     | $V_Z$ AT $I_{ZT}$   |      |       | $I_{ZT}$     | $I_{ZK}$ | $Z_{ZT}$ AT $I_{ZT}$    | $Z_{ZK}$ AT $I_{ZK}$ | $I_R$ AT $V_R$          |      | $I_{ZM}$              |
|   |                     | V                   |      |       | mA           |          | $\Omega$                |                      | $\mu\text{A}$           | V    | mA                    |
|   |                     | MIN.                | NOM. | MAX.  |              |          | MAX.                    | MAX.                 | MAX.                    |      | MAX.                  |
| SMAZ5919B   | 19B                 | 5.32                | 5.6  | 5.88  | 66.9         | 1.0      | 5.0                     | 700                  | 200                     | 3.0  | 268                   |
| SMAZ5920B   | 20B                 | 5.89                | 6.2  | 6.51  | 60.5         | 1.0      | 2.0                     | 700                  | 200                     | 4.0  | 242                   |
| SMAZ5921B   | 21B                 | 6.46                | 6.8  | 7.14  | 55.1         | 1.0      | 2.5                     | 400                  | 200                     | 5.2  | 221                   |
| SMAZ5923B   | 23B                 | 7.79                | 8.2  | 8.61  | 45.7         | 0.5      | 5.0                     | 700                  | 10                      | 6.5  | 183                   |
| SMAZ5924B   | 24B                 | 8.64                | 9.1  | 9.56  | 41.2         | 0.5      | 5.0                     | 700                  | 10                      | 7.0  | 165                   |
| SMAZ5925B   | 25B                 | 9.5                 | 10   | 10.5  | 37.5         | 0.25     | 5.0                     | 700                  | 10                      | 8.0  | 150                   |
| SMAZ5926B   | 26B                 | 10.5                | 11   | 11.6  | 34.1         | 0.25     | 5.5                     | 550                  | 5                       | 8.4  | 136                   |
| SMAZ5927B   | 27B                 | 11.4                | 12   | 12.6  | 31.2         | 0.25     | 6.5                     | 550                  | 1                       | 9.1  | 125                   |
| SMAZ5928B   | 28B                 | 12.4                | 13   | 13.7  | 28.8         | 0.25     | 7.0                     | 550                  | 1                       | 9.9  | 115                   |
| SMAZ5929B   | 29B                 | 14.3                | 15   | 15.8  | 25.0         | 0.25     | 9.0                     | 600                  | 1                       | 11.4 | 100                   |
| SMAZ5930B   | 30B                 | 15.2                | 16   | 16.8  | 23.4         | 0.25     | 10                      | 600                  | 1                       | 12.2 | 94                    |
| SMAZ5931B   | 31B                 | 17.1                | 18   | 18.9  | 20.8         | 0.25     | 12                      | 650                  | 1                       | 13.7 | 83                    |
| SMAZ5932B   | 32B                 | 19.0                | 20   | 21.0  | 18.7         | 0.25     | 14                      | 650                  | 1                       | 15.2 | 75                    |
| SMAZ5933B   | 33B                 | 20.9                | 22   | 23.1  | 17.0         | 0.25     | 17.5                    | 650                  | 1                       | 16.7 | 68                    |
| SMAZ5934B   | 34B                 | 22.8                | 24   | 25.2  | 15.6         | 0.25     | 19                      | 700                  | 1                       | 18.2 | 62                    |
| SMAZ5935B   | 35B                 | 25.7                | 27   | 28.4  | 13.9         | 0.25     | 23                      | 700                  | 1                       | 20.6 | 56                    |
| SMAZ5936B   | 36B                 | 28.5                | 30   | 31.5  | 12.5         | 0.25     | 28                      | 750                  | 1                       | 22.8 | 50                    |
| SMAZ5937B   | 37B                 | 31.4                | 33   | 34.7  | 11.4         | 0.25     | 33                      | 800                  | 1                       | 25.1 | 45                    |
| SMAZ5938B   | 38B                 | 34.2                | 36   | 37.8  | 10.4         | 0.25     | 38                      | 850                  | 1                       | 27.4 | 42                    |
| SMAZ5939B   | 39B                 | 37.1                | 39   | 41.0  | 9.6          | 0.25     | 45                      | 900                  | 1                       | 29.7 | 38                    |
| SMAZ5940B   | 40B                 | 40.9                | 43   | 45.2  | 8.7          | 0.25     | 53                      | 950                  | 1                       | 32.7 | 35                    |
| SMAZ5941B   | 41B                 | 44.65               | 47   | 49.35 | 8.0          | 0.25     | 67                      | 1000                 | 1                       | 35.8 | 32                    |
| SMAZ5942B   | 42B                 | 48.45               | 51   | 53.55 | 7.3          | 0.25     | 70                      | 1100                 | 1                       | 38.8 | 29                    |
| SMAZ5943B   | 43B                 | 53.2                | 56   | 58.8  | 6.7          | 0.25     | 86                      | 1300                 | 1                       | 42.6 | 27                    |
| SMAZ5944B   | 44B                 | 58.9                | 62   | 65.1  | 6.0          | 0.25     | 100                     | 1500                 | 1                       | 47.1 | 24                    |
| SMAZ5945B   | 45B                 | 64.6                | 68   | 71.4  | 5.5          | 0.25     | 120                     | 1700                 | 1                       | 51.7 | 22                    |



| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                                |       |                    |
|---|--------------------------------|-------|--------------------|
| PARAMETER   | SYMBOL                         | LIMIT | UNIT               |
| Typical thermal resistance, junction to lead  | $R_{\theta JL}$ <sup>(1)</sup> | 50    | $^\circ\text{C/W}$ |
| Typical thermal resistance, junction to ambient   | $R_{\theta JA}$ <sup>(2)</sup> | 250   | $^\circ\text{C/W}$ |

**Notes**

- (1) Mounted on PCB with 5.0 mm x 5.0 mm copper pads attached to each terminal
- (2) Mounted on minimum recommended pad layout

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| SMAZ5925B-E3/61                       | 0.064           | 61                     | 1800          | 7" diameter plastic tape and reel  |
| SMAZ5925B-E3/5A                       | 0.064           | 5A                     | 7500          | 13" diameter plastic tape and reel |

**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)



Fig. 1 - Steady State Power Derating



Fig. 3 - Typical Zener Voltage

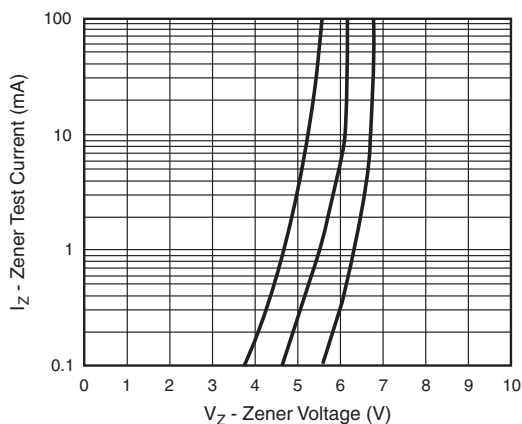


Fig. 2 - Typical Zener Voltage

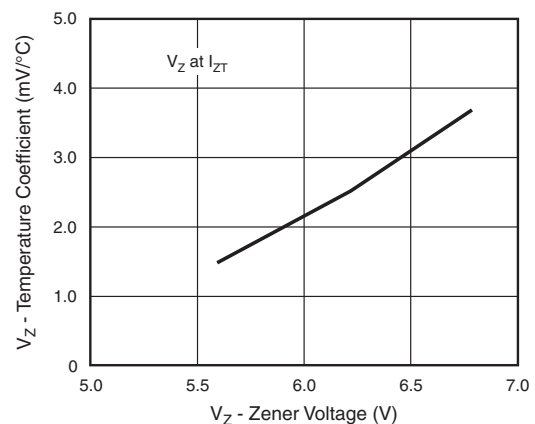


Fig. 4 - Typical Temperature Coefficients

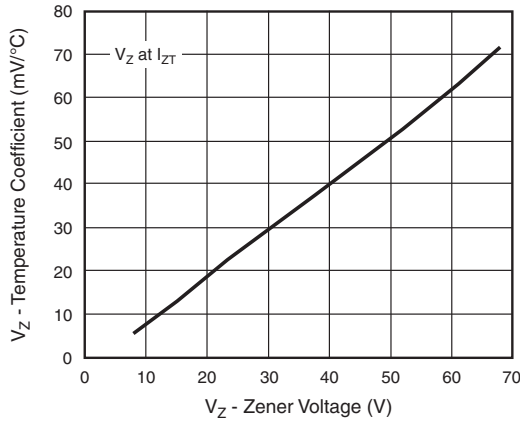


Fig. 5 - Typical Temperature Coefficients



Fig. 7 - Typical Zener Impedance

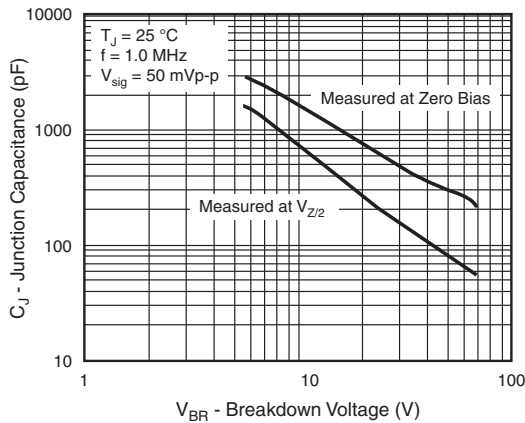
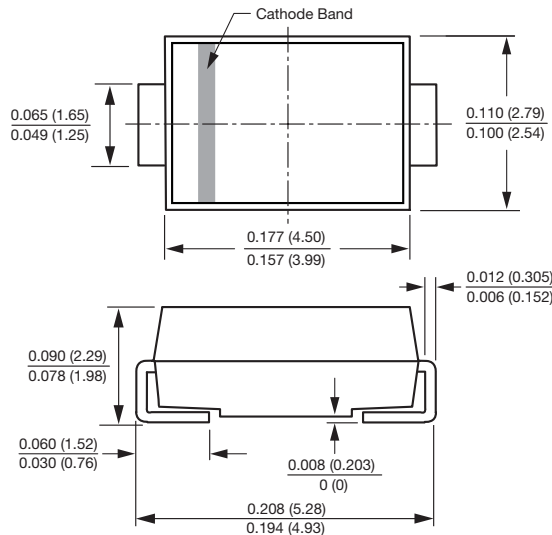


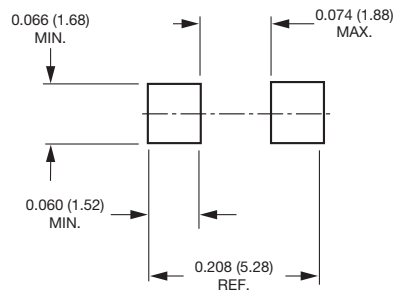
Fig. 6 - Typical Junction Capacitance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SMA (DO-214AC)



### Mounting Pad Layout





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