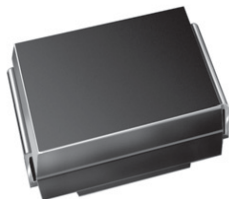


## Surface Mount Power Voltage-Regulating Diodes



DO-214AA (SMBJ)

### 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

### MECHANICAL DATA

**Case:** DO-214AA (SMBJ)

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

|                                   |               |
|-----------------------------------|---------------|
| $V_Z$                             | 5.6 V to 85 V |
| $P_{tot}$ at $T_L = 75\text{ °C}$ | 3000 mW       |
| $P_{tot}$ at $T_A = 25\text{ °C}$ | 550 mW        |
| $T_J$ max.                        | 150 °C        |
| $V_Z$ specification               | Pulse current |
| Int. construction                 | Single        |

### TYPICAL APPLICATIONS

For general purpose regulation and protection applications.

### MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER                                                                              | SYMBOL         | VALUE         | UNIT |
|----------------------------------------------------------------------------------------|----------------|---------------|------|
| Maximum steady state power dissipation at $T_L = 75\text{ °C}$ (fig. 1)                | $P_{tot}$      | 3000          | mW   |
| Maximum steady state power dissipation at $T_A = 25\text{ °C}$ (fig. 1) <sup>(1)</sup> | $P_{tot}$      | 550           | mW   |
| Maximum instantaneous forward voltage at 200 mA for all types <sup>(2)</sup>           | $V_F$          | 1.5           | V    |
| Operating junction and storage temperature range                                       | $T_J, T_{STG}$ | - 65 to + 150 | °C   |

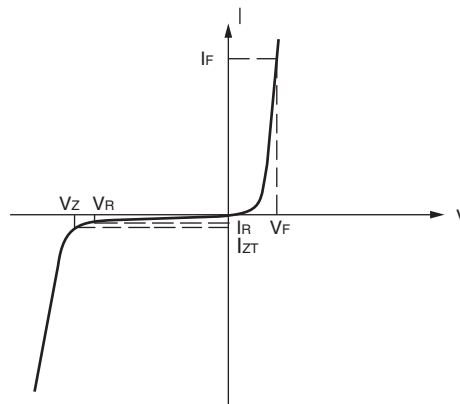
#### Notes

<sup>(1)</sup> Mounted on PCB with 5.0 mm x 5.0 mm copper pads attached to each terminal

<sup>(2)</sup> Pulse test: 300  $\mu$ s 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.                  |
| SMBZ5919B                                                                     | 19B                 | 5.32                | 5.6  | 5.88 | 66.9         | 1.0      | 5.0                     | 700                  | 200                     | 3.0  | 267                   |
| SMBZ5920B                                                                     | 20B                 | 5.89                | 6.2  | 6.51 | 60.5         | 1.0      | 2.0                     | 700                  | 200                     | 4.0  | 241                   |
| SMBZ5921B                                                                     | 21B                 | 6.46                | 6.8  | 7.14 | 55.1         | 1.0      | 2.5                     | 400                  | 200                     | 5.2  | 220                   |
| SMBZ5924B                                                                     | 24B                 | 8.64                | 9.1  | 9.56 | 41.2         | 0.5      | 4.0                     | 1000                 | 25                      | 7.0  | 164                   |
| SMBZ5925B                                                                     | 25B                 | 9.5                 | 10   | 10.5 | 37.5         | 0.25     | 4.5                     | 1000                 | 25                      | 8.0  | 150                   |
| SMBZ5926B                                                                     | 26B                 | 10.5                | 11   | 11.6 | 34.1         | 0.25     | 5.5                     | 550                  | 5                       | 8.4  | 136                   |
| SMBZ5927B                                                                     | 27B                 | 11.4                | 12   | 12.6 | 31.2         | 0.25     | 6.5                     | 550                  | 1                       | 9.1  | 125                   |
| SMBZ5928B                                                                     | 28B                 | 12.4                | 13   | 13.7 | 28.8         | 0.25     | 7.0                     | 550                  | 1                       | 9.9  | 115                   |
| SMBZ5929B                                                                     | 29B                 | 14.3                | 15   | 15.8 | 25.0         | 0.25     | 9.0                     | 600                  | 1                       | 11.4 | 100                   |
| SMBZ5930B                                                                     | 30B                 | 15.2                | 16   | 16.8 | 23.4         | 0.25     | 10.0                    | 600                  | 1                       | 12.2 | 93                    |
| SMBZ5931B                                                                     | 31B                 | 17.1                | 18   | 18.9 | 20.8         | 0.25     | 12.0                    | 650                  | 1                       | 13.7 | 83                    |
| SMBZ5932B                                                                     | 32B                 | 19.0                | 20   | 21.0 | 18.7         | 0.25     | 14.0                    | 650                  | 1                       | 15.2 | 75                    |
| SMBZ5933B                                                                     | 33B                 | 20.9                | 22   | 23.1 | 17.0         | 0.25     | 17.5                    | 650                  | 1                       | 16.7 | 68                    |
| SMBZ5934B                                                                     | 34B                 | 22.8                | 24   | 25.2 | 15.6         | 0.25     | 19.0                    | 700                  | 1                       | 18.2 | 62                    |
| SMBZ5935B                                                                     | 35B                 | 25.7                | 27   | 28.4 | 13.9         | 0.25     | 23.0                    | 700                  | 1                       | 20.6 | 55                    |
| SMBZ5936B                                                                     | 36B                 | 28.5                | 30   | 31.5 | 12.5         | 0.25     | 28.0                    | 750                  | 1                       | 22.8 | 50                    |
| SMBZ5937B                                                                     | 37B                 | 31.4                | 33   | 34.7 | 11.4         | 0.25     | 33.0                    | 800                  | 1                       | 25.1 | 45                    |
| SMBZ5938B                                                                     | 38B                 | 34.2                | 36   | 37.8 | 10.4         | 0.25     | 38.0                    | 850                  | 1                       | 27.4 | 41                    |
| SMBZ5939B                                                                     | 39B                 | 37.1                | 39   | 41.0 | 9.6          | 0.25     | 45.0                    | 900                  | 1                       | 29.7 | 38                    |
| SMBZ5940B                                                                     | 40B                 | 40.9                | 43   | 45.2 | 8.7          | 0.25     | 53.0                    | 950                  | 1                       | 32.7 | 34                    |
| SMBZ5941B                                                                     | 41B                 | 44.6                | 47   | 49.4 | 8.0          | 0.25     | 67.0                    | 1000                 | 1                       | 35.8 | 31                    |
| SMBZ5942B                                                                     | 42B                 | 48.4                | 51   | 53.6 | 7.3          | 0.25     | 70.0                    | 1100                 | 1                       | 38.8 | 29                    |
| SMBZ5943B                                                                     | 43B                 | 53.2                | 56   | 58.8 | 6.7          | 0.25     | 86.0                    | 1300                 | 1                       | 42.6 | 26                    |
| SMBZ5944B                                                                     | 44B                 | 58.9                | 62   | 65.1 | 6.0          | 0.25     | 100                     | 1500                 | 1                       | 47.1 | 24                    |
| SMBZ5945B                                                                     | 45B                 | 64.6                | 68   | 71.4 | 5.5          | 0.25     | 120                     | 1700                 | 1                       | 51.7 | 22                    |

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

| PARAMETER                                                      | SYMBOL          | LIMIT | UNIT                 |
|----------------------------------------------------------------|-----------------|-------|----------------------|
| Typical thermal resistance, junction to lead                   | $R_{\theta JL}$ | 25    | $^{\circ}\text{C/W}$ |
| Typical thermal resistance, junction to ambient <sup>(1)</sup> | $R_{\theta JA}$ | 226   | $^{\circ}\text{C/W}$ |

**Note**

(1) Mounted on minimum recommended pad layout

**ORDERING INFORMATION** (Example)

| PREFERRED P/N   | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|-----------------|-----------------|------------------------|---------------|------------------------------------|
| SMBZ5935B-E3/52 | 0.096           | 52                     | 750           | 7" diameter plastic tape and reel  |
| SMBZ5935B-E3/5B | 0.096           | 5B                     | 3200          | 13" diameter plastic tape and reel |

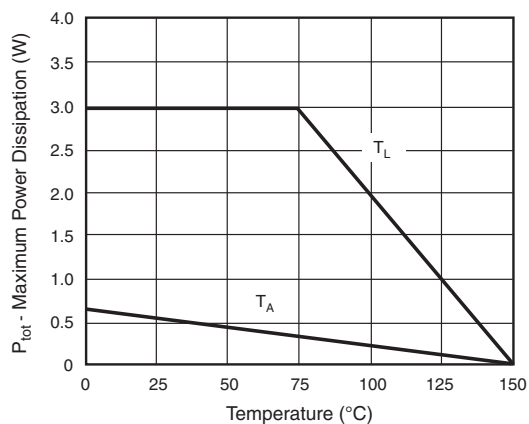
**RATINGS AND CHARACTERISTICS CURVES**( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Steady State Power Duriating

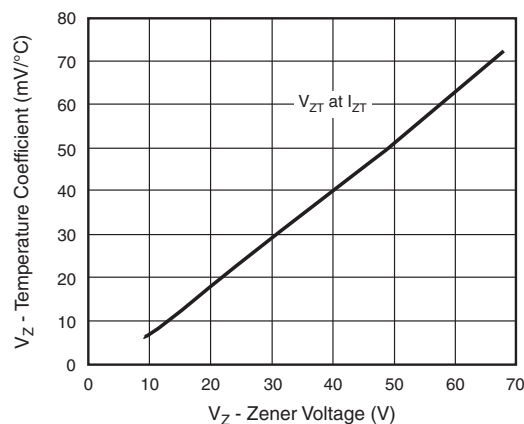


Fig. 3 - Typical Temperature Coefficients

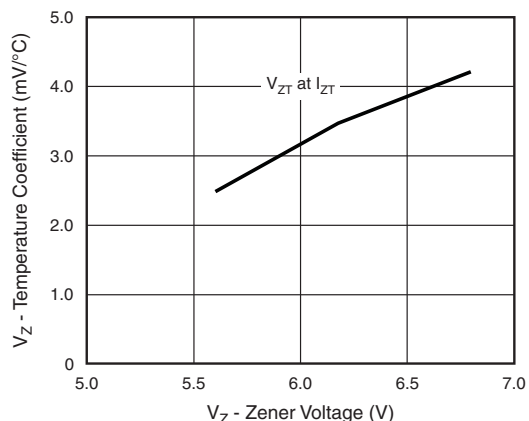


Fig. 2 - Typical Temperature Coefficients

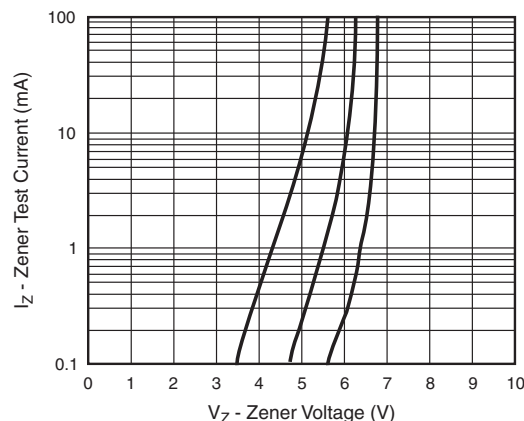


Fig. 4 - Typical Zener Voltage

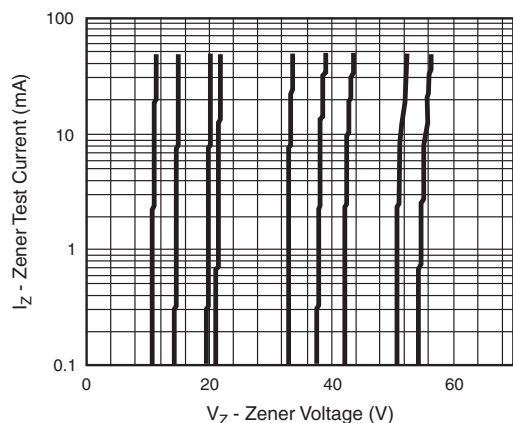


Fig. 5 - Typical Zener Voltage

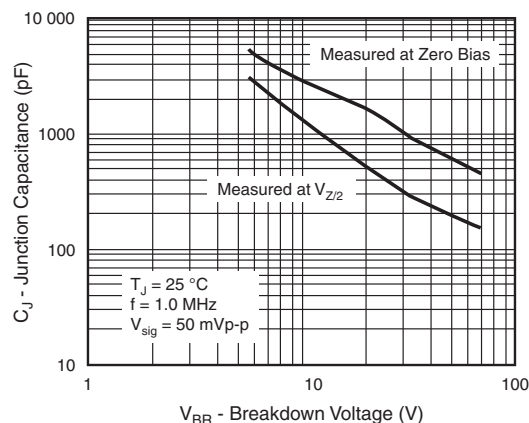


Fig. 7 - Typical Junction Capacitance

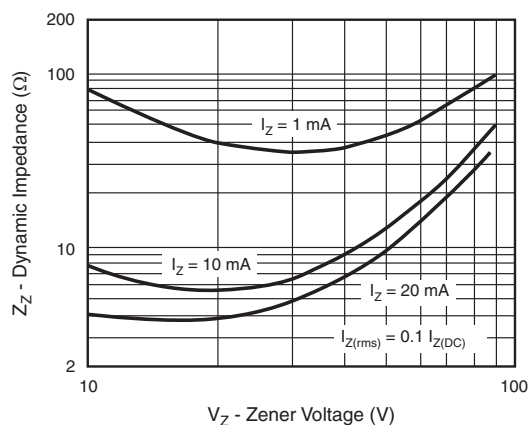
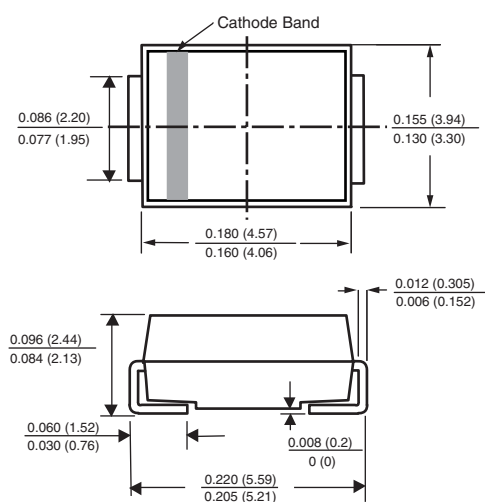
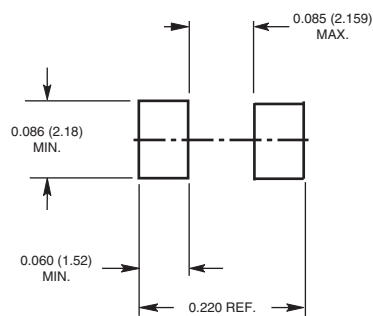


Fig. 6 - Typical Zener Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DO-214AA (SMB-J-Bend)**

**Mounting Pad Layout**




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