

## 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-020C, LF max peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

### TYPICAL APPLICATIONS

For general purpose regulation and protection applications.

### MECHANICAL DATA

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

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D  
E3 suffix for commercial grade

**Polarity:** Color band denotes cathode end

### PRIMARY CHARACTERISTICS

|            |                                |
|------------|--------------------------------|
| $V_Z$      | 5.6 V to 68 V                  |
| $P_D$      | 3.0 W at $T_L = 75\text{ °C}$  |
| $P_D$      | 550 mW at $T_A = 25\text{ °C}$ |
| $T_J$ max. | 150 °C                         |

### 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)                | $P_D$          | 3.0           | W    |
| Maximum steady state power dissipation at $T_A = 25\text{ °C}$ (Fig. 1) <sup>(1)</sup> | $P_D$          | 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                                       | $T_J, T_{STG}$ | - 55 to + 150 | °C   |

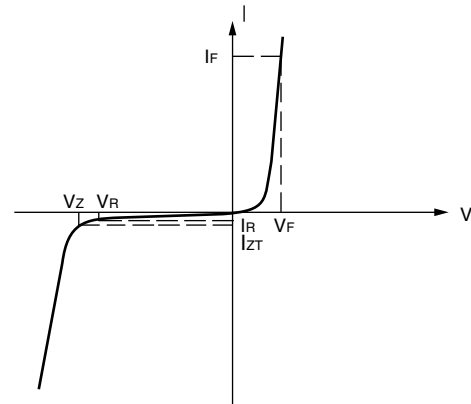
#### Notes:

(1) Mounted on minimum recommended pad layout

(2) 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 $V_Z$ AT $I_{ZT}$ (V) |     |      | TEST CURRENT $I_{ZT}$ (mA) | MAXIMUM ZENER IMPEDANCE |              |                      | MAXIMUM REVERSE LEAKAGE CURRENT $I_R$ AT $V_R$ |       | MAXIMUM ZENER CURRENT $I_{ZM}$ (mA) |
|   |                     | MIN                                 | NOM | MAX  |                            | $Z_{ZT}$ AT $I_{ZT}$    |              | $Z_{ZK}$ AT $I_{ZK}$ | $I_R$ AT $V_R$                                 | $V_F$ |                                     |
|   |                     |                                     |     |      |                            | ( $\Omega$ )            | ( $\Omega$ ) |                      |  |       |                                     |
| SMBZ5919B   | 19B                 | 5.32                                | 5.6 | 5.88 | 66.9                       | 5                       | 700          | 1                    | 200  | 3     | 267                                 |
| SMBZ5920B   | 20B                 | 5.89                                | 6.2 | 6.51 | 60.5                       | 2                       | 700          | 1                    | 200  | 4     | 241                                 |
| SMBZ5921B   | 21B                 | 6.46                                | 6.8 | 7.14 | 55.1                       | 2.5                     | 400          | 1                    | 200  | 5.2   | 220                                 |
| SMBZ5924B   | 24B                 | 8.64                                | 9.1 | 9.56 | 41.2                       | 4.0                     | 1000         | 0.5                  | 25   | 7.0   | 164                                 |
| SMBZ5925B   | 25B                 | 9.5                                 | 10  | 10.5 | 37.5                       | 4.5                     | 1000         | 0.25                 | 25   | 8.0   | 150                                 |
| SMBZ5926B   | 26B                 | 10.5                                | 11  | 11.6 | 34.1                       | 5.5                     | 550          | 0.25                 | 5  | 8.4   | 136                                 |
| SMBZ5927B   | 27B                 | 11.4                                | 12  | 12.6 | 31.2                       | 6.5                     | 550          | 0.25                 | 1  | 9.1   | 125                                 |
| SMBZ5928B   | 28B                 | 12.4                                | 13  | 13.7 | 28.8                       | 7.0                     | 550          | 0.25                 | 1  | 9.9   | 115                                 |
| SMBZ5929B   | 29B                 | 14.3                                | 15  | 15.8 | 25.0                       | 9.0                     | 600          | 0.25                 | 1  | 11.4  | 100                                 |
| SMBZ5930B   | 30B                 | 15.2                                | 16  | 16.8 | 23.4                       | 10.0                    | 600          | 0.25                 | 1  | 12.2  | 93                                  |
| SMBZ5931B   | 31B                 | 17.1                                | 18  | 18.9 | 20.8                       | 12.0                    | 650          | 0.25                 | 1  | 13.7  | 83                                  |
| SMBZ5932B   | 32B                 | 19.0                                | 20  | 21.0 | 18.7                       | 14.0                    | 650          | 0.25                 | 1  | 15.2  | 75                                  |
| SMBZ5933B   | 33B                 | 20.9                                | 22  | 23.1 | 17.0                       | 17.5                    | 650          | 0.25                 | 1  | 16.7  | 68                                  |
| SMBZ5934B   | 34B                 | 22.8                                | 24  | 25.2 | 15.6                       | 19.0                    | 700          | 0.25                 | 1  | 18.2  | 62                                  |
| SMBZ5935B   | 35B                 | 25.7                                | 27  | 28.4 | 13.9                       | 23.0                    | 700          | 0.25                 | 1  | 20.6  | 55                                  |
| SMBZ5936B   | 36B                 | 28.5                                | 30  | 31.5 | 12.5                       | 28.0                    | 750          | 0.25                 | 1  | 22.8  | 50                                  |
| SMBZ5937B   | 37B                 | 31.4                                | 33  | 34.7 | 11.4                       | 33.0                    | 800          | 0.25                 | 1  | 25.1  | 45                                  |
| SMBZ5938B   | 38B                 | 34.2                                | 36  | 37.8 | 10.4                       | 38.0                    | 850          | 0.25                 | 1  | 27.4  | 41                                  |
| SMBZ5939B   | 39B                 | 37.1                                | 39  | 41.0 | 9.6                        | 45.0                    | 900          | 0.25                 | 1  | 29.7  | 38                                  |
| SMBZ5940B   | 40B                 | 40.9                                | 43  | 45.2 | 8.7                        | 53.0                    | 950          | 0.25                 | 1  | 32.7  | 34                                  |
| SMBZ5941B   | 41B                 | 44.6                                | 47  | 49.4 | 8.0                        | 67                      | 1000         | 0.25                 | 1  | 35.8  | 31                                  |
| SMBZ5942B   | 42B                 | 48.4                                | 51  | 53.6 | 7.3                        | 70                      | 1100         | 0.25                 | 1  | 38.8  | 29                                  |
| SMBZ5943B   | 43B                 | 53.2                                | 56  | 58.8 | 6.7                        | 86                      | 1300         | 0.25                 | 1  | 42.6  | 26                                  |
| SMBZ5944B   | 44B                 | 58.9                                | 62  | 65.1 | 6.0                        | 100                     | 1500         | 0.25                 | 1  | 47.1  | 24                                  |
| SMBZ5945B   | 45B                 | 64.6                                | 68  | 71.4 | 5.5                        | 120                     | 1700         | 0.25                 | 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)

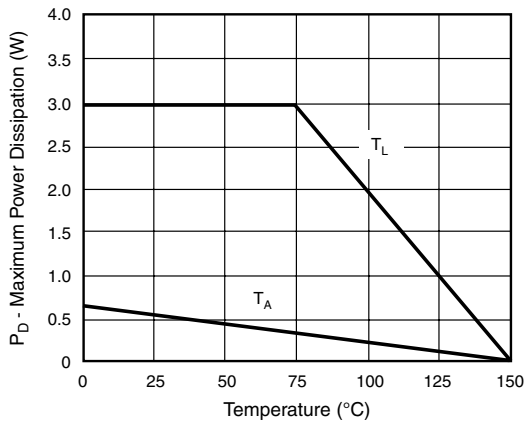


Figure 1. Steady State Power During

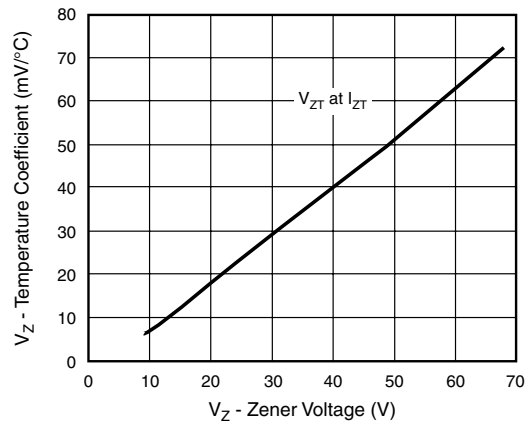


Figure 3. Typical Temperature Coefficients

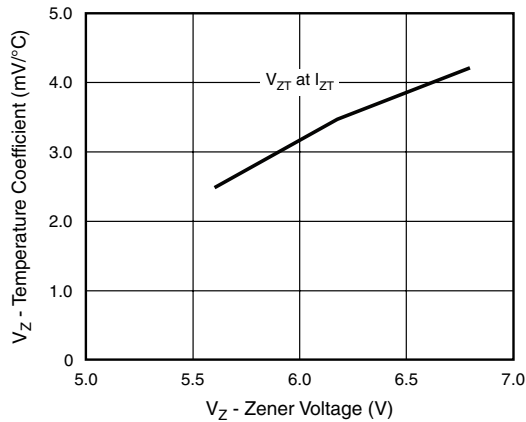


Figure 2. Typical Temperature Coefficients

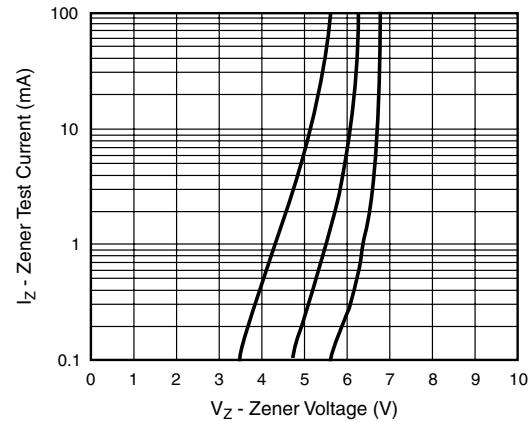


Figure 4. Typical Zener Voltage

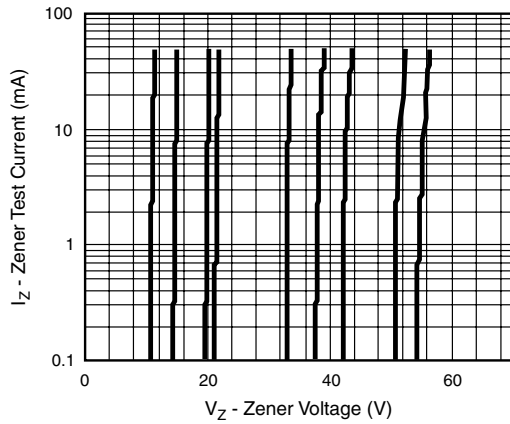


Figure 5. Typical Zener Voltage

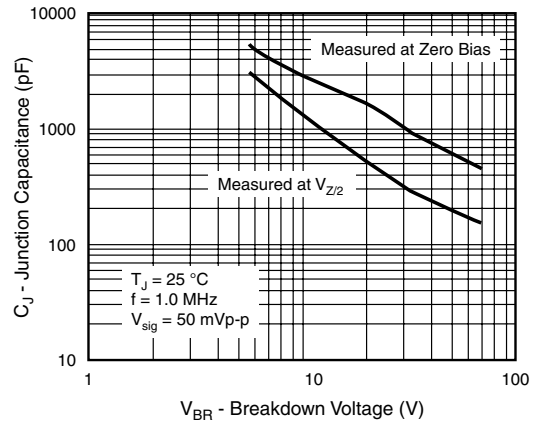


Figure 7. Typical Junction Capacitance

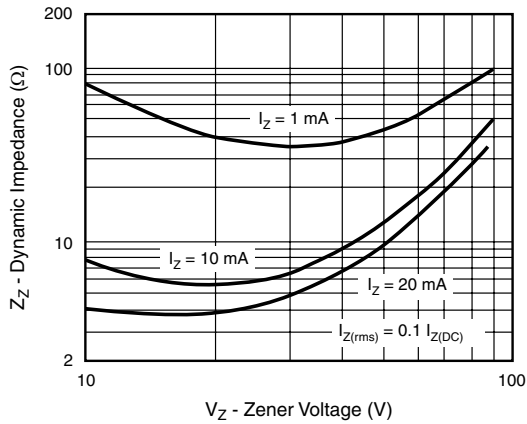
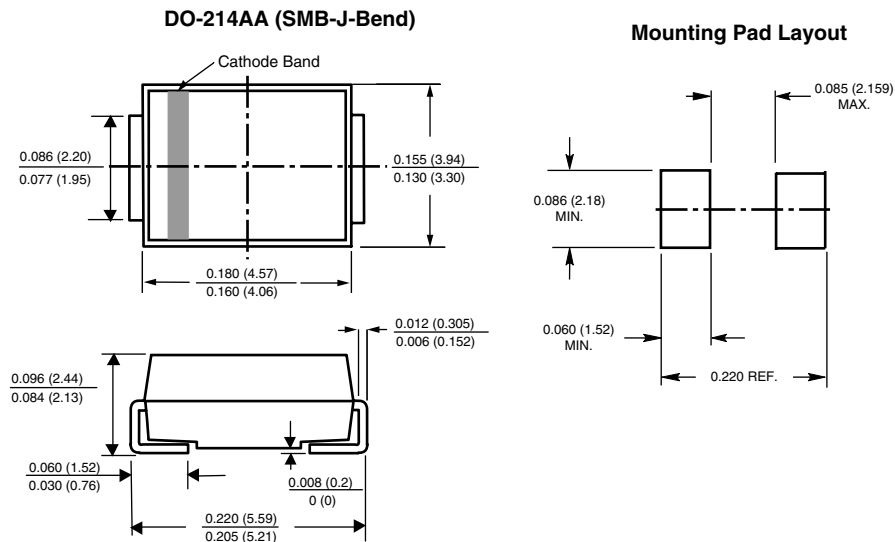


Figure 6. Typical Zener Impedance

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





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