

# 3.0SMBZ10A thru 3.0SMBZ200A

Surface Mount Zener Diodes

Vz Range: 10V to 200V Power Dissipation: 3W

## Features

- Total power dissipation: 3.0W
- For use in stabilizing and clipping circuits with high power ratings
- Low leakage current
- Moisture sensitivity: level 1, per J-STD-020
- Solder dip 260°C, 10s



DO-214AA (SMB)

## Applications

Protection from high voltage, high energy transients



**RoHS**  
COMPLIANT

## Mechanical Data

- Case: DO-214AA, molded epoxy body meeting UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002 and JESD22B-106
- Polarity: Indicated by cathode band

## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

| Parameter                                                                                     | Symbol                            | Value       | Unit  |
|-----------------------------------------------------------------------------------------------|-----------------------------------|-------------|-------|
| Maximum Steady State Power Dissipation @ T <sub>L</sub> =75°C<br>Measured at Zero Lead Length | P <sub>D</sub>                    | 3.0         | W     |
| Derate Above 75°C                                                                             |                                   | 40          | mW/°C |
| Maximum Steady State Power Dissipation @ T <sub>A</sub> =25°C                                 |                                   | 550         | mW    |
| Derate Above 25°C                                                                             |                                   | 4.4         | mW/°C |
| Thermal Resistance from Junction to Lead                                                      | R <sub>θJL</sub>                  | 25          | °C/W  |
| Thermal Resistance from Junction to Ambient                                                   | R <sub>θJA</sub>                  | 226         | °C/W  |
| Operating and Storage Temperature Range                                                       | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

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## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

| MPN         | Marking Code | Zener Voltage @ I <sub>ZT</sub><br>V <sub>Z</sub> (V) <sup>1</sup> |     |       | Test Current<br>I <sub>ZT</sub> (mA) | Maximum Zener Impedance <sup>2</sup> |                    |                        | Maximum Reverse Leakage Current |                    | Maximum Regulator Current<br>@ T <sub>A</sub> =50°C <sup>3</sup><br>I <sub>ZM</sub> (mA) |
|-------------|--------------|--------------------------------------------------------------------|-----|-------|--------------------------------------|--------------------------------------|--------------------|------------------------|---------------------------------|--------------------|------------------------------------------------------------------------------------------|
|             |              | Min                                                                | Nom | Max   |                                      | Z <sub>T</sub> @ I <sub>ZT</sub>     | Z <sub>K</sub> (Ω) | @ I <sub>ZK</sub> (mA) | I <sub>R</sub> (μA)             | V <sub>R</sub> (V) |                                                                                          |
| 3.0SMBZ10A  | 925B         | 9.5                                                                | 10  | 10.5  | 37.5                                 | 4.5                                  | 500                | 0.25                   | 2.5                             | 8                  | 300                                                                                      |
| 3.0SMBZ11A  | 926B         | 10.45                                                              | 11  | 11.55 | 34.1                                 | 5.5                                  | 550                | 0.25                   | 0.5                             | 8.4                | 272                                                                                      |
| 3.0SMBZ12A  | 927B         | 11.4                                                               | 12  | 12.6  | 31.2                                 | 6.5                                  | 550                | 0.25                   | 0.5                             | 9.1                | 250                                                                                      |
| 3.0SMBZ13A  | 928B         | 12.35                                                              | 13  | 13.65 | 28.8                                 | 7                                    | 550                | 0.25                   | 0.5                             | 9.9                | 230                                                                                      |
| 3.0SMBZ15A  | 929B         | 14.25                                                              | 15  | 15.75 | 25                                   | 9                                    | 600                | 0.25                   | 0.5                             | 11.4               | 200                                                                                      |
| 3.0SMBZ16A  | 930B         | 15.2                                                               | 16  | 16.8  | 23.4                                 | 10                                   | 600                | 0.25                   | 0.5                             | 12.2               | 186                                                                                      |
| 3.0SMBZ18A  | 931B         | 17.1                                                               | 18  | 18.9  | 20.8                                 | 12                                   | 650                | 0.25                   | 0.5                             | 13.7               | 166                                                                                      |
| 3.0SMBZ20A  | 932B         | 19                                                                 | 20  | 21    | 18.7                                 | 14                                   | 650                | 0.25                   | 0.5                             | 15.2               | 150                                                                                      |
| 3.0SMBZ22A  | 933B         | 20.9                                                               | 22  | 23.1  | 17                                   | 17.5                                 | 650                | 0.25                   | 0.5                             | 16.7               | 156                                                                                      |
| 3.0SMBZ24A  | 934B         | 22.8                                                               | 24  | 25.2  | 15.6                                 | 19                                   | 700                | 0.25                   | 0.5                             | 18.2               | 124                                                                                      |
| 3.0SMBZ27A  | 935B         | 25.65                                                              | 27  | 28.35 | 13.9                                 | 23                                   | 700                | 0.25                   | 0.5                             | 20.6               | 110                                                                                      |
| 3.0SMBZ30A  | 936B         | 28.5                                                               | 30  | 31.5  | 12.5                                 | 26                                   | 750                | 0.25                   | 0.5                             | 22.8               | 100                                                                                      |
| 3.0SMBZ33A  | 937B         | 31.35                                                              | 33  | 34.65 | 11.4                                 | 33                                   | 800                | 0.25                   | 0.5                             | 25.1               | 90                                                                                       |
| 3.0SMBZ36A  | 938B         | 34.2                                                               | 36  | 37.8  | 10.4                                 | 38                                   | 850                | 0.25                   | 0.5                             | 27.4               | 82                                                                                       |
| 3.0SMBZ39A  | 939B         | 37.05                                                              | 39  | 40.95 | 9.6                                  | 45                                   | 900                | 0.25                   | 0.5                             | 29.7               | 76                                                                                       |
| 3.0SMBZ43A  | 940B         | 40.85                                                              | 43  | 45.15 | 8.7                                  | 53                                   | 950                | 0.25                   | 0.5                             | 32.7               | 68                                                                                       |
| 3.0SMBZ47A  | 941B         | 44.65                                                              | 47  | 49.35 | 8                                    | 67                                   | 1000               | 0.25                   | 0.5                             | 35.8               | 62                                                                                       |
| 3.0SMBZ51A  | 942B         | 48.45                                                              | 51  | 53.55 | 7.3                                  | 70                                   | 1100               | 0.25                   | 0.5                             | 38.8               | 58                                                                                       |
| 3.0SMBZ56A  | 943B         | 53.2                                                               | 56  | 58.8  | 6.7                                  | 86                                   | 1300               | 0.25                   | 0.5                             | 42.6               | 52                                                                                       |
| 3.0SMBZ62A  | 944B         | 58.9                                                               | 62  | 65.1  | 6                                    | 100                                  | 1500               | 0.25                   | 0.5                             | 47.1               | 48                                                                                       |
| 3.0SMBZ68A  | 945B         | 64.6                                                               | 68  | 71.4  | 5.5                                  | 120                                  | 1700               | 0.25                   | 0.5                             | 51.7               | 44                                                                                       |
| 3.0SMBZ75A  | 946B         | 71.25                                                              | 75  | 78.75 | 5                                    | 140                                  | 2000               | 0.25                   | 1                               | 56                 | 40                                                                                       |
| 3.0SMBZ82A  | 947B         | 77.9                                                               | 82  | 86.1  | 4.6                                  | 160                                  | 2500               | 0.25                   | 1                               | 62.2               | 36                                                                                       |
| 3.0SMBZ91A  | 948B         | 86.45                                                              | 91  | 95.55 | 4.1                                  | 200                                  | 3000               | 0.25                   | 1                               | 69.2               | 32                                                                                       |
| 3.0SMBZ100A | 949B         | 95                                                                 | 100 | 105   | 3.7                                  | 250                                  | 3100               | 0.25                   | 1                               | 76                 | 30                                                                                       |
| 3.0SMBZ110A | 950B         | 104.5                                                              | 110 | 115.5 | 3.4                                  | 300                                  | 4000               | 0.25                   | 1                               | 83.6               | 26                                                                                       |
| 3.0SMBZ120A | 951B         | 114                                                                | 120 | 126   | 3.1                                  | 380                                  | 4500               | 0.25                   | 1                               | 91.2               | 24                                                                                       |
| 3.0SMBZ130A | 952B         | 123.5                                                              | 130 | 136.5 | 2.9                                  | 450                                  | 5000               | 0.25                   | 1                               | 98.8               | 22                                                                                       |
| 3.0SMBZ150A | 953B         | 142.5                                                              | 150 | 157.5 | 2.5                                  | 600                                  | 6000               | 0.25                   | 1                               | 114                | 20                                                                                       |
| 3.0SMBZ160A | 954B         | 152                                                                | 160 | 168   | 2.3                                  | 700                                  | 6500               | 0.25                   | 1                               | 121.6              | 18                                                                                       |
| 3.0SMBZ180A | 955B         | 171                                                                | 180 | 189   | 2.1                                  | 900                                  | 7000               | 0.25                   | 1                               | 136.8              | 16                                                                                       |
| 3.0SMBZ200A | 956B         | 190                                                                | 200 | 210   | 1.9                                  | 1200                                 | 8000               | 0.25                   | 1                               | 152                | 14                                                                                       |

Notes:

- Standard voltage tolerance is ±5%.
- The Zener impedance is derived from the 1KHz AC voltage, which results when an AC current having an RMS value equal to 10% of the Zener current (I<sub>ZT</sub> or I<sub>ZK</sub>) is superimposed on I<sub>ZT</sub> or I<sub>ZK</sub>. Zener impedance is measure at two points to insure a sharp knee on the breakdown curve and to eliminate unstable units.
- Valid provided that electrodes at a distance of 10mm from case are kept at ambient temperature.

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## Typical Electrical Characteristic Curves

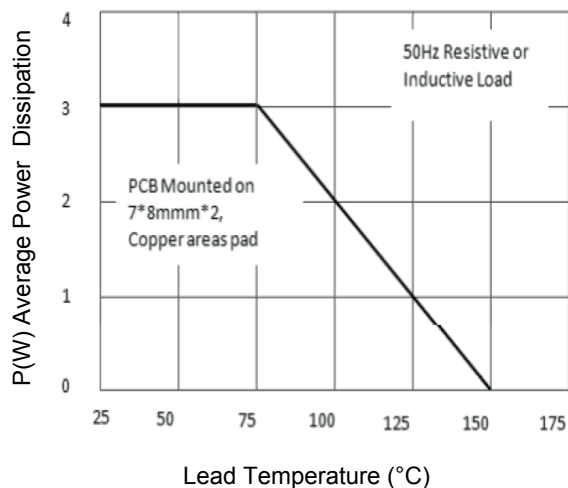


Figure 1. Maximum Continuous Power Dissipation

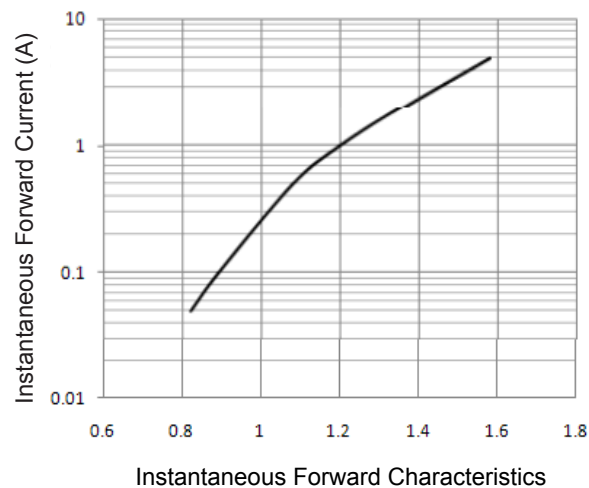


Figure 2. Typical Instantaneous Forward Characteristics

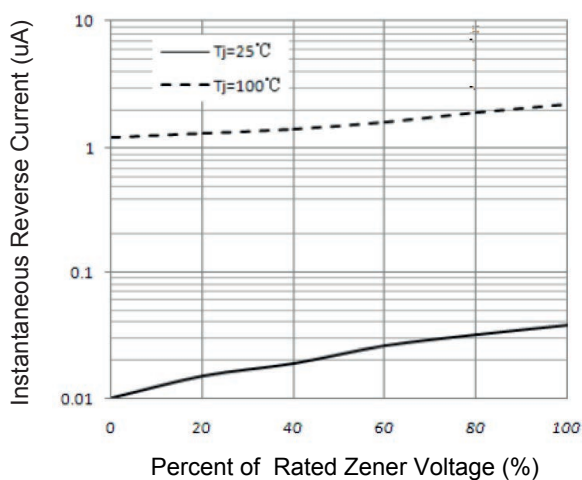


Figure 3. Typical Reverse Characteristics

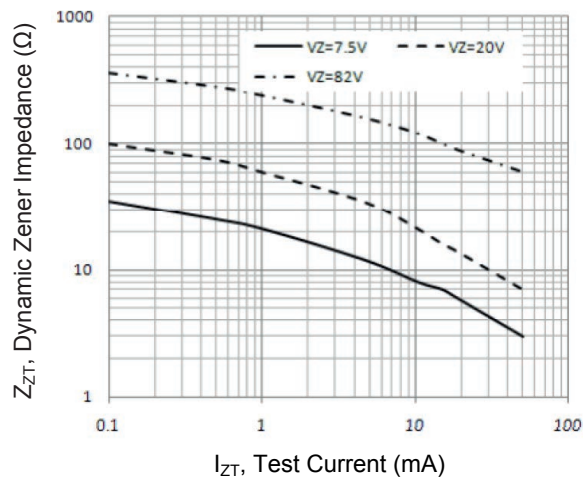


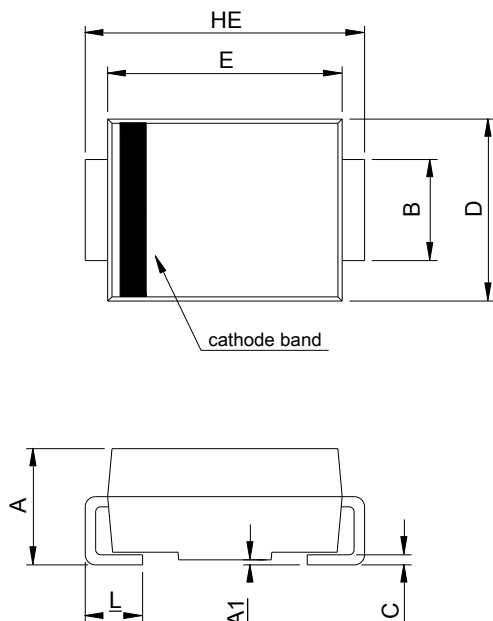
Figure 4. Typical Zener Impedance

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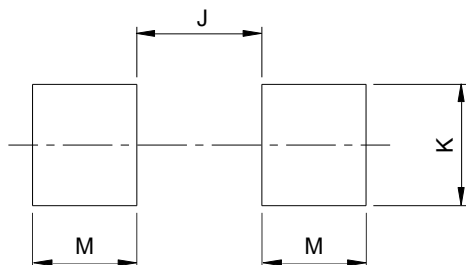
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## Package Outline Dimensions DO-214AA (SMB)



| SMB (DO-214AA) |             |      |        |       |
|----------------|-------------|------|--------|-------|
| DIM            | Millimeters |      | Inches |       |
|                | Min.        | Max. | Min.   | Max.  |
| A              | 1.95        | 2.65 | 0.077  | 0.104 |
| A1             | 0.00        | 0.20 | 0.000  | 0.008 |
| B              | 1.95        | 2.20 | 0.077  | 0.087 |
| C              | 0.15        | 0.31 | 0.006  | 0.012 |
| D              | 3.30        | 3.95 | 0.130  | 0.156 |
| E              | 4.06        | 4.60 | 0.160  | 0.181 |
| HE             | 5.10        | 5.60 | 0.201  | 0.220 |
| L              | 0.76        | 1.60 | 0.030  | 0.063 |

## Recommended Pad Layout



| Recommended Pad Layout (Reference ONLY) |             |      |        |       |
|-----------------------------------------|-------------|------|--------|-------|
| DIM                                     | Millimeters |      | Inches |       |
|                                         | Min.        | Max. | Min.   | Max.  |
| J                                       | -           | 2.60 | -      | 0.102 |
| K                                       | 2.20        | -    | 0.087  | -     |
| M                                       | 1.80        | -    | 0.071  | -     |