# Zener Diodes

## FEATURES

- High reliability
- Voltage range includes 35 breakdown voltages from 10 V to 270 V with ± 2 % for BZG03B-series
- Fits onto 5 mm SMD footpads
- Wave and reflow solderable
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

## APPLICATIONS

- Voltage stabilization

| PRIMARY CHARACTERISTICS | | |
|---|---|---|
| **PARAMETER** | **VALUE** | **UNIT** |
| $V_Z$ range nom. | 10 to 270 | V |
| Test current $I_{ZT}$ | 2 to 50 | mA |
| $V_{BR}$ | 9.8 to 264 | V |
| $V_{WM}$ | 8.2 to 220 | V |
| $P_{PPM}$ | 300 | W |
| $T_J$ max. | 150 | °C |
| $V_Z$ specification | Pulse current | |
| Int. construction | Single | |
| Polarity | Uni-directional | |

| ORDERING INFORMATION | | | |
|---|---|---|---|
| **DEVICE NAME** | **ORDERING CODE** | **TAPED UNITS PER REEL** | **MINIMUM ORDER QUANTITY** |
| BZG03B-series | BZG03B-series-TR | 1500 (7" reel) | 6000/box |
| BZG03B-series | BZG03B-series-TR3 | 6000 (13" reel) | 6000/box |

| PACKAGE | | | | |
|---|---|---|---|---|
| **PACKAGE NAME** | **WEIGHT** | **MOLDING COMPOUND FLAMMABILITY RATING** | **MOISTURE SENSITIVITY LEVEL** | **SOLDERING CONDITIONS** |
| DO-214AC | 77 mg | UL 94 V-0 | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |

| ABSOLUTE MAXIMUM RATINGS ($T_{amb}$ = 25 °C, unless otherwise specified) | | | | |
|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **SYMBOL** | **VALUE** | **UNIT** |
| Power dissipation | $R_{thJA}$ < 25 K/W, $T_{amb}$ = 75 °C | $P_{tot}$ | 3000 | mW |
| | $R_{thJA}$ < 100 K/W, $T_{amb}$ = 25 °C | $P_{tot}$ | 1250 | mW |
| Non repetitive peak surge power dissipation | $t_p$ = 100 µs sq.pulse, $T_j$ = 25 °C prior to surge | $P_{ZSM}$ | 600 | W |
| Junction to lead | | $R_{thJL}$ | 25 | K/W |
| Junction to ambient air | Mounted on epoxy-glass hard tissue, fig. 1a | $R_{thJA}$ | 150 | K/W |
| | Mounted on epoxy-glass hard tissue, fig. 1b | $R_{thJA}$ | 125 | K/W |
| | Mounted on Al-oxid-ceramic ($Al_2O_3$), fig. 1b | $R_{thJA}$ | 100 | K/W |
| Junction temperature | | $T_j$ | 150 | °C |
| Storage temperature range | | $T_{stg}$ | -65 to +150 | °C |
| Forward voltage (max.) | $I_F$ = 0.5 A | $V_F$ | 1.2 | V |



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**ELECTRICAL CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified)

| PART NUMBER | ZENER VOLTAGE RANGE | | | TEST CURRENT | REVERSE LEAKAGE CURRENT | | DYNAMIC RESISTANCE | | TEMPERATURE COEFFICIENT OF ZENER VOLTAGE | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $V_Z$ at $I_{ZT1}$ | | | $I_{ZT1}$ | $I_R$ at $V_R$ | | $Z_Z$ at $I_{ZT1}$ | | $TK_{VZ}$ at $I_{ZT1}$ | |
| | V | | | mA | µA | V | Ω | | %/K | |
| | MIN. | NOM. | MAX. | | MAX. | | TYP. | MAX. | MIN. | MAX. |
| BZG03B10 | 9.80 | 10 | 10.20 | 50 | 10 | 7.5 | 2 | 4 | 0.05 | 0.09 |
| BZG03B11 | 10.78 | 11 | 11.22 | 50 | 4 | 8.2 | 4 | 7 | 0.05 | 0.1 |
| BZG03B12 | 11.76 | 12 | 12.24 | 50 | 3 | 9.1 | 4 | 7 | 0.05 | 0.1 |
| BZG03B13 | 12.74 | 13 | 13.26 | 50 | 2 | 10 | 5 | 10 | 0.05 | 0.1 |
| BZG03B15 | 14.70 | 15 | 15.30 | 50 | 1 | 11 | 5 | 10 | 0.05 | 0.1 |
| BZG03B16 | 15.68 | 16 | 16.32 | 25 | 1 | 12 | 6 | 15 | 0.06 | 0.11 |
| BZG03B18 | 17.64 | 18 | 18.36 | 25 | 1 | 13 | 6 | 15 | 0.06 | 0.11 |
| BZG03B20 | 19.60 | 20 | 20.40 | 25 | 1 | 15 | 6 | 15 | 0.06 | 0.11 |
| BZG03B22 | 21.56 | 22 | 22.44 | 25 | 1 | 16 | 6 | 15 | 0.06 | 0.11 |
| BZG03B24 | 23.52 | 24 | 24.48 | 25 | 1 | 18 | 7 | 15 | 0.06 | 0.11 |
| BZG03B27 | 26.46 | 27 | 27.54 | 25 | 1 | 20 | 7 | 15 | 0.06 | 0.11 |
| BZG03B30 | 29.40 | 30 | 30.60 | 25 | 1 | 22 | 8 | 15 | 0.06 | 0.11 |
| BZG03B33 | 32.34 | 33 | 33.66 | 25 | 1 | 24 | 8 | 15 | 0.06 | 0.11 |
| BZG03B36 | 35.28 | 36 | 36.72 | 10 | 1 | 27 | 21 | 40 | 0.06 | 0.11 |
| BZG03B39 | 38.22 | 39 | 39.78 | 10 | 1 | 30 | 21 | 40 | 0.06 | 0.11 |
| BZG03B43 | 42.14 | 43 | 43.86 | 10 | 1 | 33 | 24 | 45 | 0.07 | 0.12 |
| BZG03B47 | 46.06 | 47 | 47.94 | 10 | 1 | 36 | 24 | 45 | 0.07 | 0.12 |
| BZG03B51 | 49.98 | 51 | 52.02 | 10 | 1 | 39 | 25 | 60 | 0.07 | 0.12 |
| BZG03B56 | 54.88 | 56 | 57.12 | 10 | 1 | 43 | 25 | 60 | 0.07 | 0.12 |
| BZG03B62 | 60.76 | 62 | 63.24 | 10 | 1 | 47 | 25 | 80 | 0.08 | 0.13 |
| BZG03B68 | 66.64 | 68 | 69.36 | 10 | 1 | 51 | 25 | 80 | 0.08 | 0.13 |
| BZG03B75 | 73.50 | 75 | 76.50 | 10 | 1 | 56 | 30 | 100 | 0.08 | 0.13 |
| BZG03B82 | 80.36 | 82 | 83.64 | 10 | 1 | 62 | 30 | 100 | 0.08 | 0.13 |
| BZG03B91 | 89.18 | 91 | 92.82 | 5 | 1 | 68 | 60 | 200 | 0.09 | 0.13 |
| BZG03B100 | 98.00 | 100 | 102.00 | 5 | 1 | 75 | 60 | 200 | 0.09 | 0.13 |
| BZG03B110 | 107.80 | 110 | 112.20 | 5 | 1 | 82 | 80 | 250 | 0.09 | 0.13 |
| BZG03B120 | 117.60 | 120 | 122.40 | 5 | 1 | 91 | 80 | 250 | 0.09 | 0.13 |
| BZG03B130 | 127.40 | 130 | 132.60 | 5 | 1 | 100 | 110 | 300 | 0.09 | 0.13 |
| BZG03B150 | 147.00 | 150 | 153.00 | 5 | 1 | 110 | 130 | 300 | 0.09 | 0.13 |
| BZG03B160 | 156.80 | 160 | 163.20 | 5 | 1 | 120 | 150 | 350 | 0.09 | 0.13 |
| BZG03B180 | 176.40 | 180 | 183.60 | 5 | 1 | 130 | 180 | 400 | 0.09 | 0.13 |
| BZG03B200 | 196.00 | 200 | 204.00 | 5 | 1 | 150 | 200 | 500 | 0.09 | 0.13 |
| BZG03B220 | 215.60 | 220 | 224.40 | 2 | 1 | 160 | 350 | 750 | 0.09 | 0.13 |
| BZG03B240 | 235.20 | 240 | 244.80 | 2 | 1 | 180 | 400 | 850 | 0.09 | 0.13 |
| BZG03B270 | 264.60 | 270 | 275.40 | 2 | 1 | 200 | 450 | 1000 | 0.09 | 0.13 |


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## BASIC CHARACTERISTICS ($T_{amb}$ = 25 °C, unless otherwise specified)

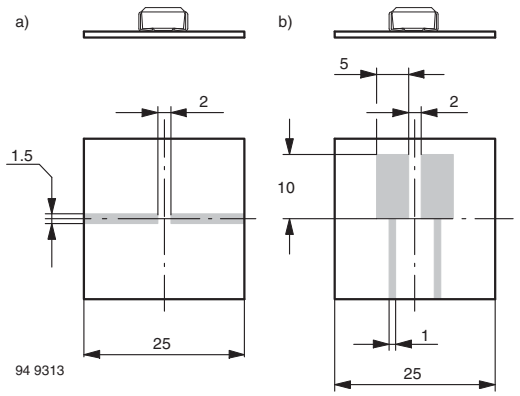


Fig. 1 - Boards for $R_{thJA}$ Definition (Copper Overlay 35 µ)

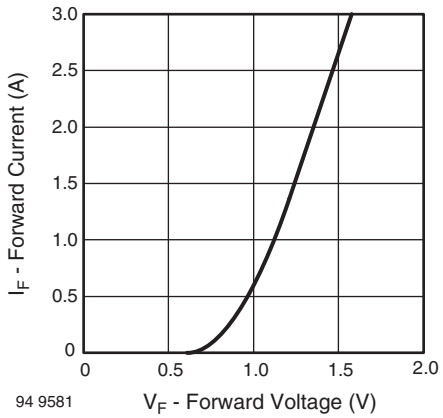


Fig. 3 - Forward Current vs. Forward Voltage

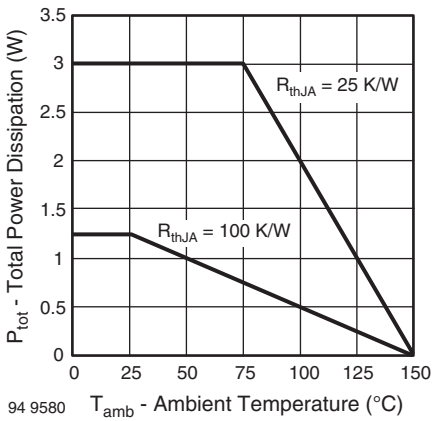


Fig. 2 - Total Power Dissipation vs. Ambient Temperature

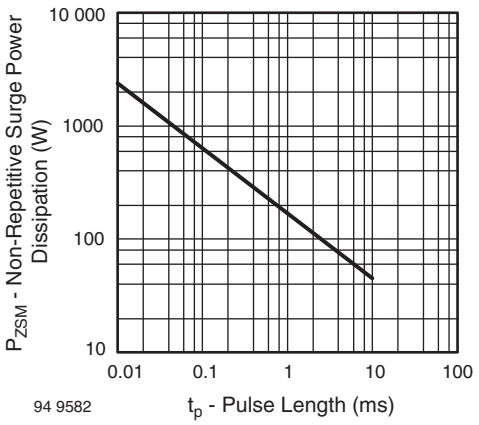


Fig. 4 - Non Repetitive Surge Power Dissipation vs. Pulse Length

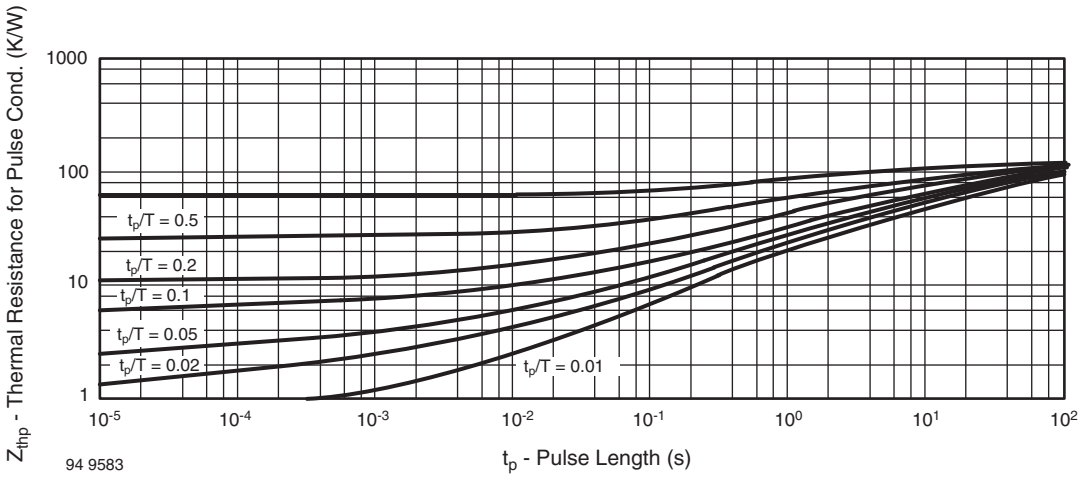


Fig. 5 - Thermal Response



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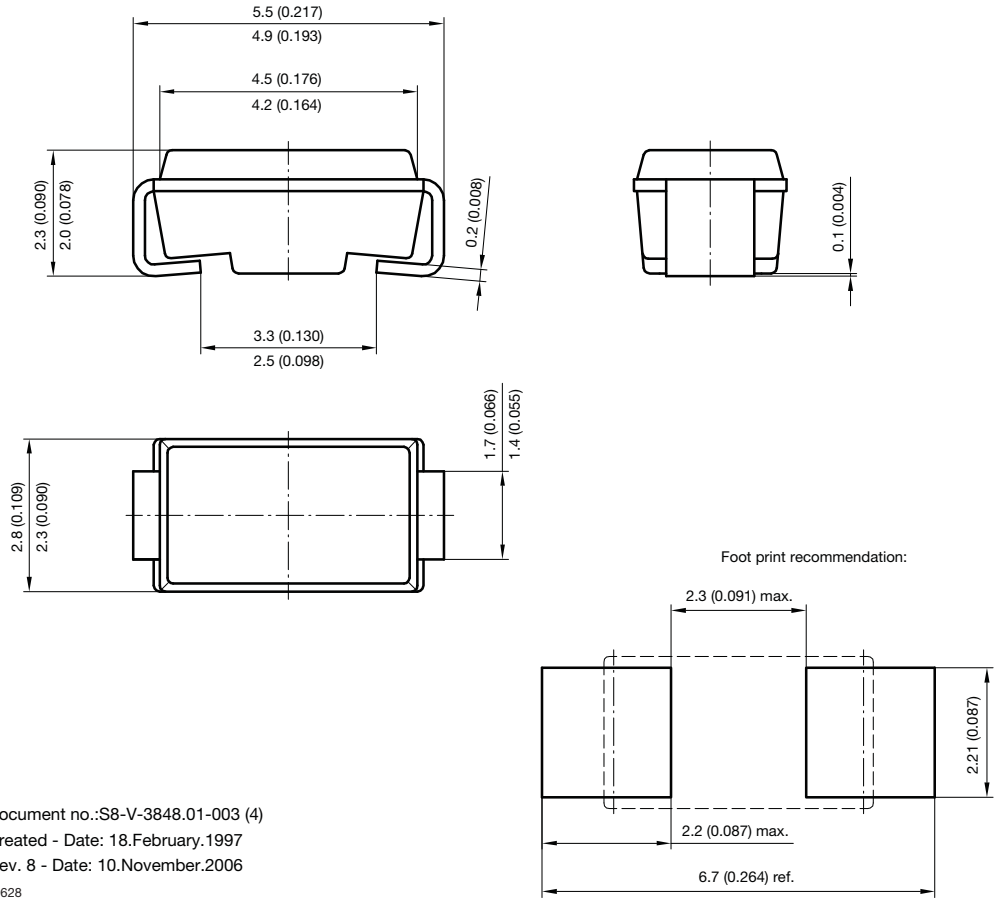
**PACKAGE DIMENSIONS** in millimeters (inches): **DO-214AC**

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