

## Zener Diodes



### FEATURES

- High reliability
- Voltage range includes 35 breakdown voltages from 10 V to 270 V with  $\pm 2\%$  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](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### APPLICATIONS

- Voltage stabilization

| PRIMARY CHARACTERISTICS      |                 |      |
|------------------------------|-----------------|------|
| PARAMETER                    | VALUE           | UNIT |
| V <sub>Z</sub> range nom.    | 10 to 270       | V    |
| Test current I <sub>ZT</sub> | 2 to 50         | mA   |
| V <sub>BR</sub>              | 9.8 to 264      | V    |
| V <sub>WM</sub>              | 8.2 to 220      | V    |
| P <sub>PPM</sub>             | 300             | W    |
| T <sub>J</sub> max.          | 150             | °C   |
| V <sub>Z</sub> 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 <sub>amb</sub> = 25 °C, unless otherwise specified) |   |                   |             |      |  |
|---|---|-------------------|-------------|------|--|
| PARAMETER   | TEST CONDITION  | SYMBOL            | VALUE       | UNIT |  |
| Power dissipation   | R <sub>thJA</sub> < 25 K/W, T <sub>amb</sub> = 75 °C                    | P <sub>tot</sub>  | 3000        | mW   |  |
|   | R <sub>thJA</sub> < 100 K/W, T <sub>amb</sub> = 25 °C                   | P <sub>tot</sub>  | 1250        | mW   |  |
| Non repetitive peak surge power dissipation                                     | t <sub>p</sub> = 100 μs sq.pulse, T <sub>j</sub> = 25 °C prior to surge | P <sub>ZSM</sub>  | 600         | W    |  |
| Junction to lead  |   | R <sub>thJL</sub> | 25          | K/W  |  |
| Junction to ambient air   | Mounted on epoxy-glass hard tissue, fig. 1a                             | R <sub>thJA</sub> | 150         | K/W  |  |
|   | Mounted on epoxy-glass hard tissue, fig. 1b                             | R <sub>thJA</sub> | 125         | K/W  |  |
|   | Mounted on Al-oxid-ceramic (Al <sub>2</sub> O <sub>3</sub> ), fig. 1b   | R <sub>thJA</sub> | 100         | K/W  |  |
| Junction temperature  |   | T <sub>j</sub>    | 150         | °C   |  |
| Storage temperature range   |   | T <sub>stg</sub>  | -65 to +150 | °C   |  |
| Forward voltage (max.)  | I <sub>F</sub> = 0.5 A  | V <sub>F</sub>    | 1.2         | V    |  |



| ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified) |                                    |      |        |                  |                                  |     |                                    |      |  |      |
|---|------------------------------------|------|--------|------------------|----------------------------------|-----|------------------------------------|------|--|------|
| PART NUMBER   | ZENER VOLTAGE RANGE                |      |        | TEST CURRENT     | REVERSE LEAKAGE CURRENT          |     | DYNAMIC RESISTANCE                 |      | TEMPERATURE COEFFICIENT OF ZENER VOLTAGE |      |
|   | V <sub>Z</sub> at I <sub>ZT1</sub> |      |        | I <sub>ZT1</sub> | I <sub>R</sub> at V <sub>R</sub> |     | Z <sub>Z</sub> at I <sub>ZT1</sub> |      | TK <sub>VZ</sub> at I <sub>ZT1</sub>     |      |
|   | 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 |

**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

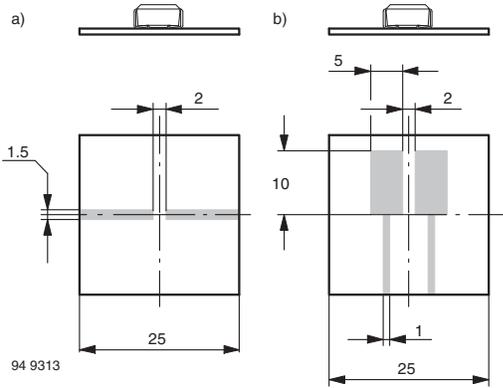


Fig. 1 - Boards for  $R_{thJA}$  Definition (Copper Overlay 35  $\mu$ )

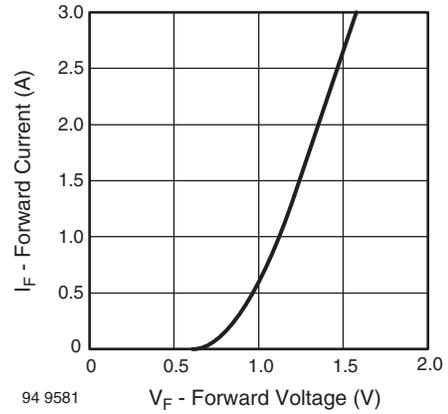


Fig. 3 - Forward Current vs. Forward Voltage

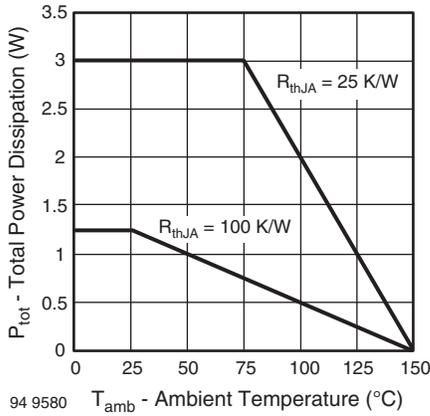


Fig. 2 - Total Power Dissipation vs. Ambient Temperature

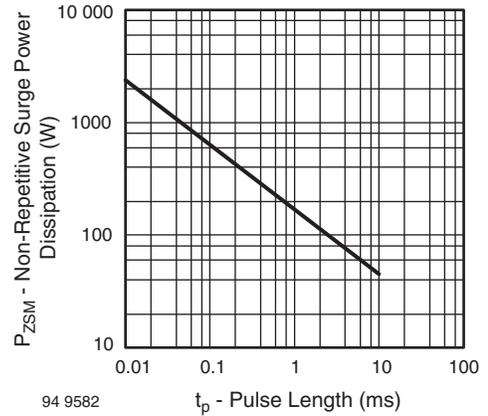


Fig. 4 - Non Repetitive Surge Power Dissipation vs. Pulse Length

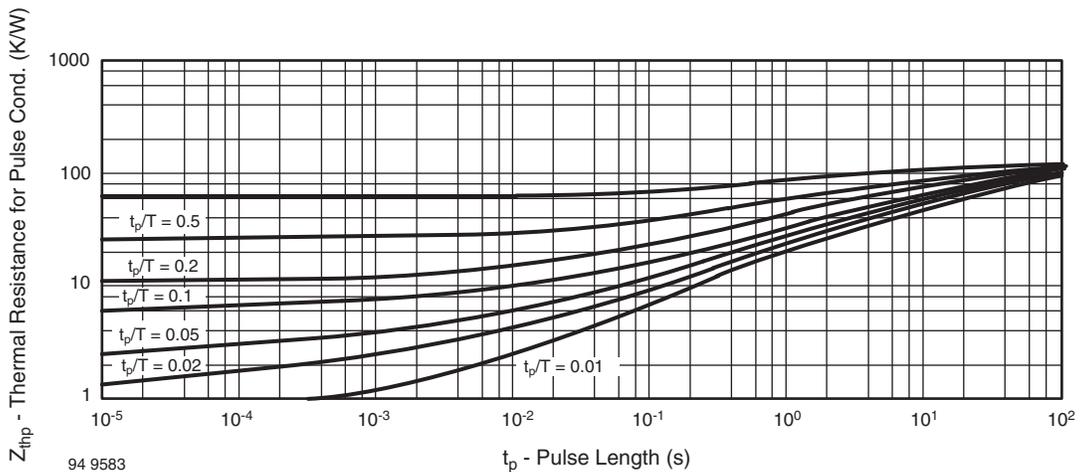
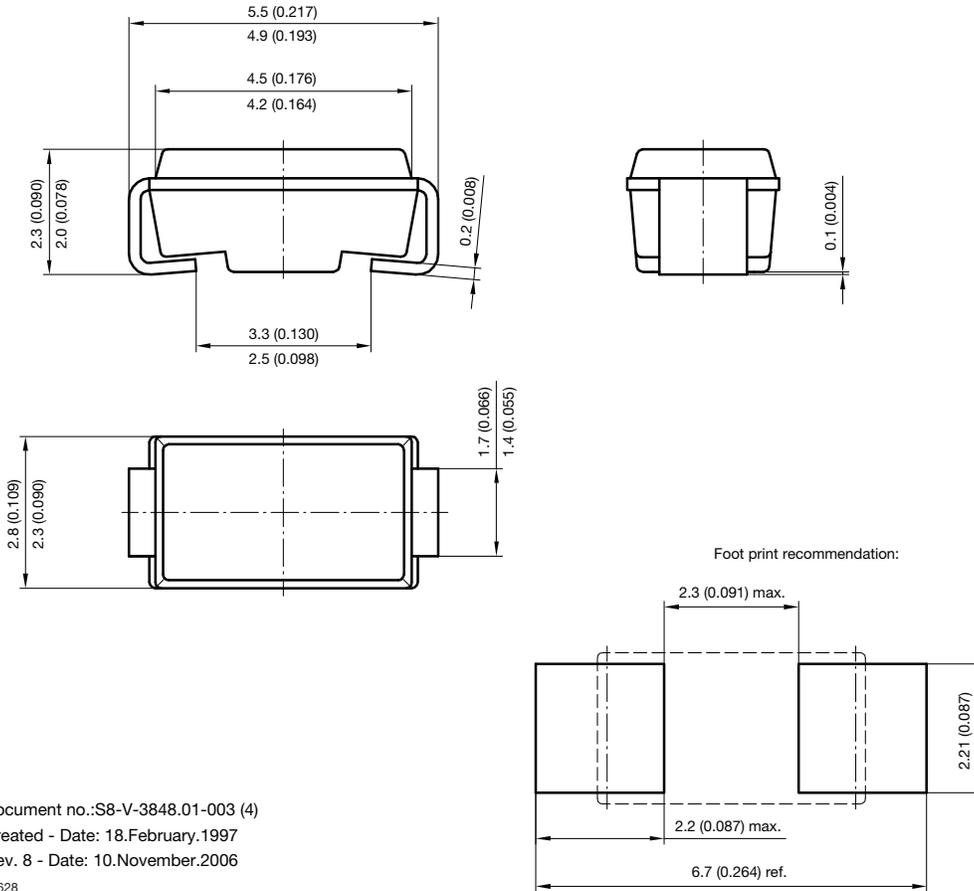


Fig. 5 - Thermal Response



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



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