



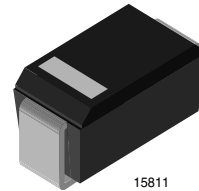
**THE DATASHEET OF  
BZG04-43TR3**



## Zener Diodes with Surge Current Specification

### Features

- Glass passivated junction
- High reliability
- Stand-off Voltage range 8.2 V to 220 V
- Excellent clamping capability
- Fast response time (typ.  $\leq 1$  ps from 0 to  $V_{Zmin}$ )
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



15811

### Applications

Protection from high voltage, high energy transients

### Mechanical Data

**Case:** DO-214AC

**Weight:** approx. 77 mg

**Packaging Codes/Options:**

TR / 1.5 k 7 " reel

TR3 / 6 k 13 " reel 6 k/box

### Absolute Maximum Ratings

$T_{amb} = 25$  °C, unless otherwise specified

| Parameter                                   | Test condition  | Symbol     | Value         | Unit |
|---|---|------------|---------------|------|
| Power dissipation                           | $R_{thJA} < 25$ K/W, $T_{amb} = 100$ °C                           | $P_{diss}$ | 3             | W    |
|   | $R_{thJA} < 100$ K/W, $T_{amb} = 50$ °C                           | $P_{diss}$ | 1.25          | W    |
| Non repetitive peak surge power dissipation | $t_p = 10/1000$ $\mu$ s sq.pulse,<br>$T_j = 25$ °C prior to surge | $P_{ZSM}$  | 300           | W    |
| Peak forward surge current                  | 10 ms single half sine wave                                       | $I_{FSM}$  | 50            | A    |
| Junction temperature                        |   | $T_j$      | 150           | °C   |
| Storage temperature range                   |   | $T_{stg}$  | - 65 to + 150 | °C   |

### Thermal Characteristics

$T_{amb} = 25$  °C, unless otherwise specified

| Parameter        | Test condition                                    | Symbol     | Value | Unit |
|------------------|---|------------|-------|------|
| Junction lead    |   | $R_{thJL}$ | 25    | K/W  |
| Junction ambient | 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  |

### Electrical Characteristics

$T_{amb} = 25$  °C, unless otherwise specified

| Parameter       | Test condition | Symbol | Min | Typ. | Max | Unit |
|-----------------|----------------|--------|-----|------|-----|------|
| Forward voltage | $I_F = 0.5$ A  | $V_F$  |     |      | 1.2 | V    |



## Electrical Characteristics

| Partnumber | Standoff Voltage |                | Breakdown Voltage                  |    | TK <sub>VZ</sub> @ I <sub>R</sub> |      | Clamping Voltage                     |                   | Junction Capacitance                             |
|------------|------------------|----------------|------------------------------------|----|-----------------------------------|------|--------------------------------------|-------------------|--|
|            | V <sub>R</sub>   | I <sub>R</sub> | V <sub>(BR)</sub> @ I <sub>R</sub> |    |                                   |      | V <sub>CL(R)</sub> @ I <sub>PP</sub> | @ I <sub>ZT</sub> | C <sub>j</sub> @ V <sub>R</sub> = 0 V, f = 1 MHz |
|            | V                | μA             | V                                  | mA | %K                                |      | V <sup>*)</sup>                      | A <sup>*)</sup>   | pF   |
|            |                  | max            | min                                |    | typ                               | max  | max                                  |                   | typ  |
| BZG04-8V2  | 8.2              | 20             | 9.4                                | 50 | 0.05                              | 0.09 | 14.8                                 | 20.3              | 1200   |
| BZG04-9V1  | 9.1              | 5              | 10.4                               | 50 | 0.05                              | 0.1  | 15.7                                 | 19.1              | 1100   |
| BZG04-10   | 10               | 5              | 11.4                               | 50 | 0.05                              | 0.1  | 17                                   | 17.7              | 1000   |
| BZG04-11   | 11               | 5              | 12.4                               | 50 | 0.05                              | 0.1  | 18.9                                 | 15.9              | 850  |
| BZG04-12   | 12               | 5              | 13.8                               | 50 | 0.05                              | 0.1  | 20.9                                 | 14.4              | 815  |
| BZG04-13   | 13               | 5              | 15.3                               | 25 | 0.06                              | 0.11 | 22.9                                 | 13.1              | 785  |
| BZG04-15   | 15               | 5              | 16.8                               | 25 | 0.06                              | 0.11 | 25.6                                 | 11.7              | 710  |
| BZG04-16   | 16               | 5              | 18.8                               | 25 | 0.06                              | 0.11 | 28.4                                 | 10.6              | 655  |
| BZG04-18   | 18               | 5              | 20.8                               | 25 | 0.06                              | 0.11 | 31                                   | 9.7               | 610  |
| BZG04-20   | 20               | 5              | 22.8                               | 25 | 0.06                              | 0.11 | 33.8                                 | 8.9               | 570  |
| BZG04-22   | 22               | 5              | 25.1                               | 25 | 0.06                              | 0.11 | 38.1                                 | 7.9               | 545  |
| BZG04-24   | 24               | 5              | 28                                 | 25 | 0.06                              | 0.11 | 42.2                                 | 7.1               | 505  |
| BZG04-27   | 27               | 5              | 31                                 | 25 | 0.06                              | 0.11 | 46.2                                 | 6.5               | 475  |
| BZG04-30   | 30               | 5              | 34                                 | 10 | 0.06                              | 0.11 | 50.1                                 | 6.0               | 450  |
| BZG04-33   | 33               | 5              | 37                                 | 10 | 0.06                              | 0.11 | 54.1                                 | 5.5               | 420  |
| BZG04-36   | 36               | 5              | 40                                 | 10 | 0.07                              | 0.12 | 60.7                                 | 4.9               | 390  |
| BZG04-39   | 39               | 5              | 44                                 | 10 | 0.07                              | 0.12 | 65.5                                 | 4.6               | 370  |
| BZG04-43   | 43               | 5              | 48                                 | 10 | 0.07                              | 0.12 | 70.8                                 | 4.2               | 350  |
| BZG04-47   | 47               | 5              | 52                                 | 10 | 0.07                              | 0.12 | 78.6                                 | 3.8               | 330  |
| BZG04-51   | 51               | 5              | 58                                 | 10 | 0.08                              | 0.13 | 86.5                                 | 3.5               | 310  |
| BZG04-56   | 56               | 5              | 64                                 | 10 | 0.08                              | 0.13 | 94.4                                 | 3.2               | 291  |
| BZG04-62   | 62               | 5              | 70                                 | 10 | 0.08                              | 0.13 | 103.5                                | 2.9               | 280  |
| BZG04-68   | 68               | 5              | 77                                 | 10 | 0.08                              | 0.13 | 114                                  | 2.6               | 275  |
| BZG04-75   | 75               | 5              | 85                                 | 5  | 0.09                              | 0.13 | 126                                  | 2.4               | 260  |
| BZG04-82   | 82               | 5              | 94                                 | 5  | 0.09                              | 0.13 | 139                                  | 2.2               | 250  |
| BZG04-91   | 91               | 5              | 104                                | 5  | 0.09                              | 0.13 | 152                                  | 2.0               | 243  |
| BZG04-100  | 100              | 5              | 114                                | 5  | 0.09                              | 0.13 | 167                                  | 1.8               | 170  |
| BZG04-110  | 110              | 5              | 124                                | 5  | 0.09                              | 0.13 | 185                                  | 1.6               | 153  |
| BZG04-120  | 120              | 5              | 138                                | 5  | 0.09                              | 0.13 | 204                                  | 1.5               | 150  |
| BZG04-130  | 130              | 5              | 153                                | 5  | 0.09                              | 0.13 | 224                                  | 1.3               | 145  |
| BZG04-150  | 150              | 5              | 168                                | 5  | 0.09                              | 0.13 | 249                                  | 1.2               | 140  |
| BZG04-160  | 160              | 5              | 188                                | 5  | 0.09                              | 0.13 | 276                                  | 1.1               | 135  |
| BZG04-180  | 180              | 5              | 208                                | 2  | 0.09                              | 0.13 | 305                                  | 1.0               | 131  |
| BZG04-200  | 200              | 5              | 228                                | 2  | 0.09                              | 0.13 | 336                                  | 0.9               | 122  |
| BZG04-220  | 220              | 5              | 251                                | 2  | 0.09                              | 0.13 | 380                                  | 0.8               | 120  |

<sup>\*)</sup> 10/1000 μs pulse

## Typical Characteristics ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

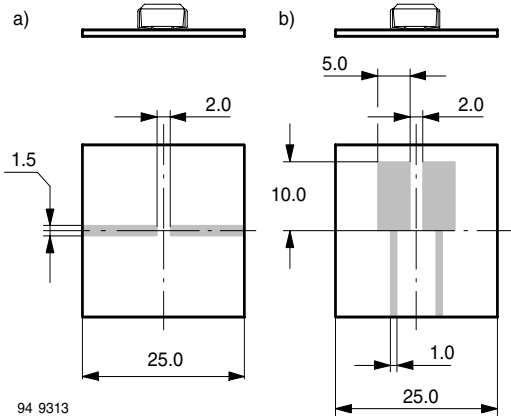


Figure 1. Boards for  $R_{thJA}$  definition (copper overlay  $35\mu$ )

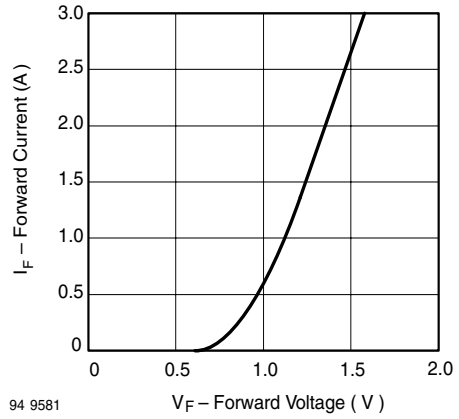


Figure 3. Forward Current vs. Forward Voltage

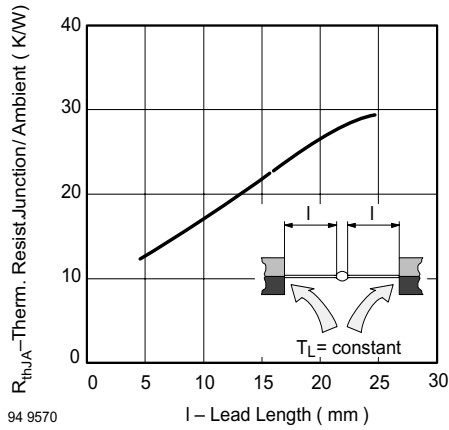


Figure 2. Typ. Thermal Resistance vs. Lead Length

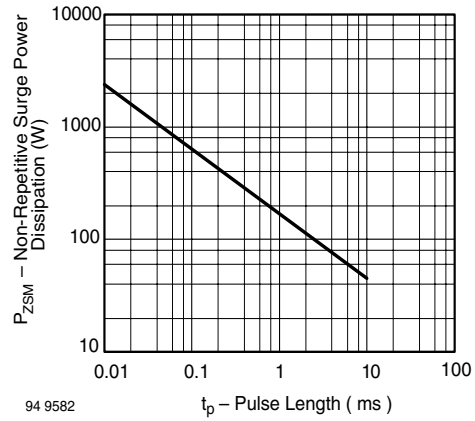


Figure 4. Non Repetitive Surge Power Dissipation vs. Pulse Length

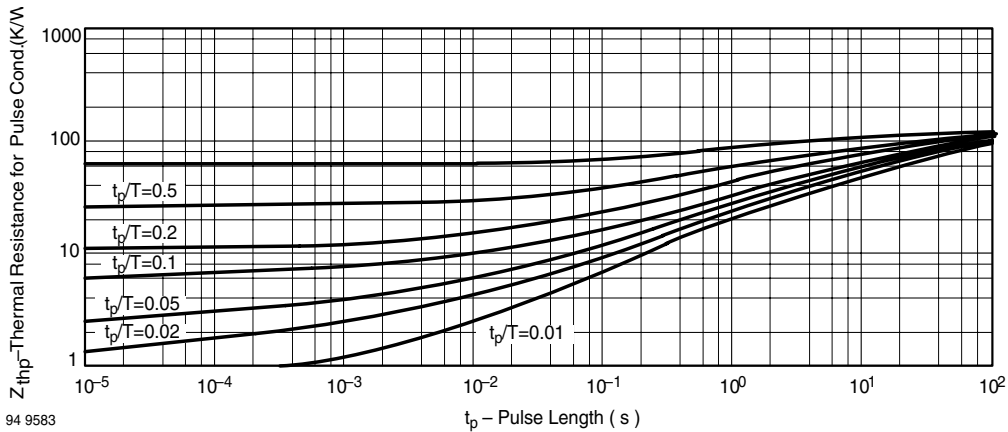


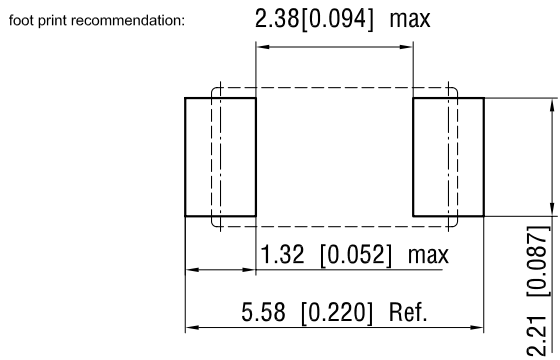
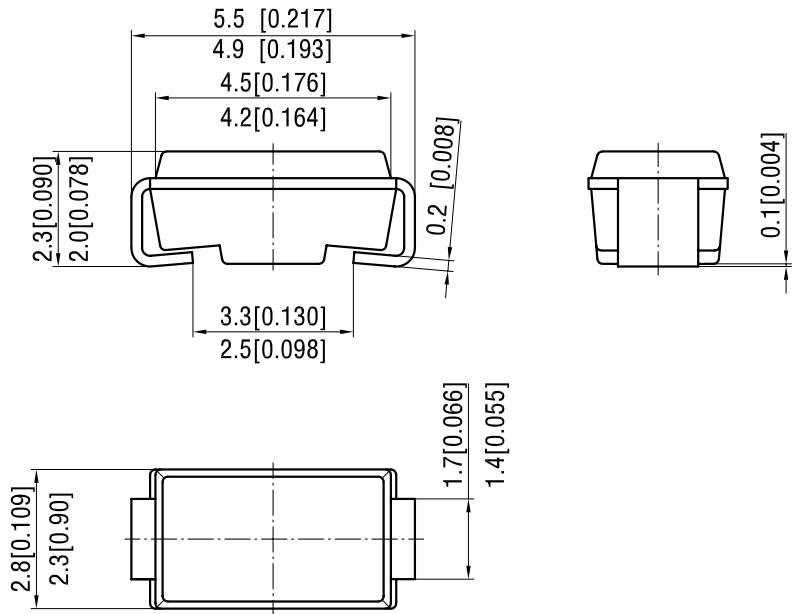
Figure 5. Thermal Response

# BZG04-Series

Vishay Semiconductors



## Package Dimensions in mm (Inches)



19628

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Rev. g - Date: 14.February.2005



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3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

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