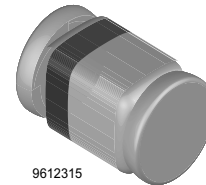


## Small Signal Zener Diodes

### Features

- Saving space
- Hermetic sealed parts
- Electrical data identical with the devices BZT55..Series / TZM..Series
- Fits onto SOD323/SOD110 footprints
- Very sharp reverse characteristic
- Low reverse current level
- Very high stability
- Low noise
- Available with tighter tolerances
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



9612315

### Applications

- Voltage stabilization

### Mechanical Data

**Case:** MicroMELF

**Weight:** approx. 12 mg

**Packaging codes/options:**

TR / 2.5 k per 7" reel, 12.5 k/box

TR3 / 10 k per 13" reel, 10 k/box

### Absolute Maximum Ratings

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

| Parameter                 | Test condition                 | Symbol    | Value         | Unit               |
|---------------------------|--------------------------------|-----------|---------------|--------------------|
| Power dissipation         | $R_{thJA} \leq 300\text{ K/W}$ | $P_V$     | 500           | mW                 |
| Z-current                 |                                | $I_Z$     | $P_V/V_Z$     | mA                 |
| Junction temperature      |                                | $T_j$     | 175           | $^{\circ}\text{C}$ |
| Storage temperature range |                                | $T_{stg}$ | - 65 to + 175 | $^{\circ}\text{C}$ |

### Thermal Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

| Parameter               | Test condition  | Symbol     | Value | Unit |
|-------------------------|---|------------|-------|------|
| Junction to ambient air | mounted on epoxy-glass hard tissue, Fig. 1                                | $R_{thJA}$ | 500   | K/W  |
| Junction tie point      | 35 $\mu\text{m}$ copper clad, 0.9 $\text{mm}^2$ copper area per electrode | $R_{thJL}$ | 300   | K/W  |

### Electrical Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

| Parameter       | Test condition        | Symbol | Min | Typ. | Max | Unit |
|-----------------|-----------------------|--------|-----|------|-----|------|
| Forward voltage | $I_F = 200\text{ mA}$ | $V_F$  |     |      | 1.5 | V    |



## Electrical Characteristics

### BZM55C..

| Partnumber  | Zener Voltage Range <sup>1)</sup> |      | Dynamic Resistance                             |  | Test Current | Temperature Coefficient |        | Test Current | Reverse Leakage Current                    |   |                   |
|-------------|-----------------------------------|------|--|--|--------------|-------------------------|--------|--------------|--|---|-------------------|
|             | V <sub>Z</sub> at I <sub>ZT</sub> |      | r <sub>zjT</sub> at I <sub>ZT</sub> , f = 1kHz | r <sub>zjK</sub> at I <sub>ZK</sub> , f = 1kHz |              | TK <sub>VZ</sub>        |        |              | I <sub>R</sub> at T <sub>amb</sub> = 25 °C | I <sub>R</sub> at T <sub>amb</sub> = 150 °C | at V <sub>R</sub> |
|             | min                               | max  | Ω  |  | mA           | %K                      |        | mA           | μA   |   | V                 |
| BZM55C2V4   | 2.28                              | 2.56 | < 85   | < 600  | 5            | - 0.09                  | - 0.06 | 1            | < 50                                       | < 100                                       | 1                 |
| BZM55C2V7   | 2.5                               | 2.9  | < 85   | < 600  | 5            | - 0.09                  | - 0.06 | 1            | < 10                                       | < 50  | 1                 |
| BZM55C3V0   | 2.8                               | 3.2  | < 90   | < 600  | 5            | - 0.08                  | - 0.05 | 1            | < 4  | < 40  | 1                 |
| BZM55C3V3   | 3.1                               | 3.5  | < 90   | < 600  | 5            | - 0.08                  | - 0.05 | 1            | < 2  | < 40  | 1                 |
| BZM55C3V6   | 3.4                               | 3.8  | < 90   | < 600  | 5            | - 0.08                  | - 0.05 | 1            | < 2  | < 40  | 1                 |
| BZM55C3V9   | 3.7                               | 4.1  | < 90   | < 600  | 5            | - 0.08                  | - 0.05 | 1            | < 2  | < 40  | 1                 |
| BZM55C4V3   | 4                                 | 4.6  | < 90   | < 600  | 5            | - 0.06                  | - 0.03 | 1            | < 1  | < 20  | 1                 |
| BZM55C4V7   | 4.4                               | 5    | < 80   | < 600  | 5            | - 0.05                  | 0.02   | 1            | < 0.5                                      | < 10  | 1                 |
| BZM55C5V1   | 4.8                               | 5.4  | < 60   | < 550  | 5            | - 0.02                  | 0.02   | 1            | < 0.1                                      | < 2   | 1                 |
| BZM55C5V6   | 5.2                               | 6    | < 40   | < 450  | 5            | - 0.05                  | 0.05   | 1            | < 0.1                                      | < 2   | 1                 |
| BZM55C6V2   | 5.8                               | 6.6  | < 10   | < 200  | 5            | 0.03                    | 0.06   | 1            | < 0.1                                      | < 2   | 2                 |
| BZM55C6V8   | 6.4                               | 7.2  | < 8  | < 150  | 5            | 0.03                    | 0.07   | 1            | < 0.1                                      | < 2   | 3                 |
| BZM55C7V5   | 7                                 | 7.9  | < 7  | < 50   | 5            | 0.03                    | 0.07   | 1            | < 0.1                                      | < 2   | 5                 |
| BZM55C8V2   | 7.7                               | 8.7  | < 7  | < 50   | 5            | 0.03                    | 0.08   | 1            | < 0.1                                      | < 2   | 6.2               |
| BZM55C9V1 * | 8.5                               | 9.6  | < 10   | < 50   | 5            | 0.03                    | 0.09   | 1            | < 0.1                                      | < 2   | 6.8               |
| BZM55C10 *  | 9.4                               | 0.6  | < 15   | < 70   | 5            | 0.03                    | 0.1    | 1            | < 0.1                                      | < 2   | 7.5               |
| BZM55C11 *  | 10.4                              | 11.6 | < 20   | < 70   | 5            | 0.03                    | 0.11   | 1            | < 0.1                                      | < 2   | 8.2               |
| BZM55C12 *  | 11.4                              | 12.7 | < 20   | < 90   | 5            | 0.03                    | 0.11   | 1            | < 0.1                                      | < 2   | 9.1               |
| BZM55C13 *  | 12.4                              | 14.1 | < 26   | < 110  | 5            | 0.03                    | 0.11   | 1            | < 0.1                                      | < 2   | 10                |
| BZM55C15 *  | 13.8                              | 15.6 | < 30   | < 110  | 5            | 0.03                    | 0.11   | 1            | < 0.1                                      | < 2   | 11                |
| BZM55C16 *  | 15.3                              | 17.1 | < 40   | < 170  | 5            | 0.03                    | 0.11   | 1            | < 0.1                                      | < 2   | 12                |
| BZM55C18 *  | 16.8                              | 19.1 | < 50   | < 170  | 5            | 0.03                    | 0.11   | 1            | < 0.1                                      | < 2   | 13                |
| BZM55C20 *  | 18.8                              | 21.2 | < 55   | < 220  | 5            | 0.03                    | 0.11   | 1            | < 0.1                                      | < 2   | 15                |
| BZM55C22 *  | 20.8                              | 23.3 | < 55   | < 220  | 5            | 0.04                    | 0.12   | 1            | < 0.1                                      | < 2   | 16                |
| BZM55C24 *  | 22.8                              | 25.6 | < 80   | < 220  | 5            | 0.04                    | 0.12   | 1            | < 0.1                                      | < 2   | 18                |
| BZM55C27 *  | 25.1                              | 28.9 | < 80   | < 220  | 5            | 0.04                    | 0.12   | 1            | < 0.1                                      | < 2   | 20                |
| BZM55C30 *  | 28                                | 32   | < 80   | < 220  | 5            | 0.04                    | 0.12   | 1            | < 0.1                                      | < 2   | 22                |
| BZM55C33 *  | 31                                | 35   | < 80   | < 220  | 5            | 0.04                    | 0.12   | 1            | < 0.1                                      | < 2   | 24                |
| BZM55C36 *  | 34                                | 38   | < 80   | < 220  | 5            | 0.04                    | 0.12   | 1            | < 0.1                                      | < 2   | 27                |
| BZM55C39 *  | 37                                | 41   | < 90   | < 500  | 2.5          | 0.04                    | 0.12   | 0.5          | < 0.1                                      | < 5   | 30                |
| BZM55C43 *  | 40                                | 46   | < 90   | < 600  | 2.5          | 0.04                    | 0.12   | 0.5          | < 0.1                                      | < 5   | 33                |
| BZM55C47 *  | 44                                | 50   | 110  | < 700  | 2.5          | 0.04                    | 0.12   | 0.5          | < 0.1                                      | < 5   | 36                |
| BZM55C51 *  | 48                                | 54   | 125  | < 700  | 2.5          | 0.04                    | 0.12   | 0.5          | < 0.1                                      | < 10  | 39                |
| BZM55C56 *  | 52                                | 60   | 135  | < 1000   | 2.5          | 0.04                    | 0.12   | 0.5          | < 0.1                                      | < 10  | 43                |
| BZM55C62 *  | 58                                | 66   | 150  | < 1000   | 2.5          | 0.04                    | 0.12   | 0.5          | < 0.1                                      | < 10  | 47                |
| BZM55C68 *  | 64                                | 72   | 200  | < 1000   | 2.5          | 0.04                    | 0.12   | 0.5          | < 0.1                                      | < 10  | 51                |
| BZM55C75 *  | 70                                | 79   | 250  | < 1500   | 2.5          | 0.04                    | 0.12   | 0.5          | < 0.1                                      | < 10  | 56                |

<sup>1)</sup> t<sub>p</sub> ≤ 10 ms, T/t<sub>p</sub> > 1000

<sup>\*)</sup> Additional measurement of Voltage group 9V1 to 75 at 95 % V<sub>Zmin</sub> ≤ 35 nA at T<sub>j</sub> 25 °C



## Electrical Characteristics

### BZM55B..

| Partnumber  | Zener Voltage Range <sup>1)</sup> |       | Dynamic Resistance                           |  | Test Current<br>$I_{ZT}$ | Temperature Coefficient |        | Test Current<br>$I_{ZK}$ | Reverse Leakage Current               |  |          |
|-------------|-----------------------------------|-------|--|--|--------------------------|-------------------------|--------|--------------------------|---------------------------------------|--|----------|
|             | $V_Z$ at $I_{ZT}$                 |       | $r_{zJT}$ at $I_{ZT}$ ,<br>$f = 1\text{kHz}$ | $r_{zJK}$ at $I_{ZK}$ ,<br>$f = 1\text{kHz}$ |                          | TK <sub>VZ</sub>        |        |                          | $I_R$ at $T_{amb} = 25^\circ\text{C}$ | $I_R$ at $T_{amb} = 150^\circ\text{C}$ | at $V_R$ |
|             | min                               | max   | $\Omega$                                     |  | mA                       | %/K                     |        | mA                       | $\mu\text{A}$                         |  | V        |
| BZM55B2V4   | 2.35                              | 2.45  | < 85   | < 600  | 5                        | - 0.09                  | - 0.06 | 1                        | < 50                                  | < 100                                  | 1        |
| BZM55B2V7   | 2.64                              | 2.76  | < 85   | < 600  | 5                        | - 0.09                  | - 0.06 | 1                        | < 10                                  | < 50                                   | 1        |
| BZM55B3V0   | 2.94                              | 3.06  | < 90   | < 600  | 5                        | - 0.08                  | - 0.05 | 1                        | < 4                                   | < 40                                   | 1        |
| BZM55B3V3   | 3.24                              | 3.36  | < 90   | < 600  | 5                        | - 0.08                  | - 0.05 | 1                        | < 2                                   | < 40                                   | 1        |
| BZM55B3V6   | 3.52                              | 3.68  | < 90   | < 600  | 5                        | - 0.08                  | - 0.05 | 1                        | < 2                                   | < 40                                   | 1        |
| BZM55B3V9   | 3.82                              | 3.98  | < 90   | < 600  | 5                        | - 0.08                  | - 0.05 | 1                        | < 2                                   | < 40                                   | 1        |
| BZM55B4V3   | 4.22                              | 4.38  | < 90   | < 600  | 5                        | - 0.06                  | - 0.03 | 1                        | < 1                                   | < 20                                   | 1        |
| BZM55B4V7   | 4.6                               | 4.80  | < 80   | < 600  | 5                        | - 0.05                  | 0.02   | 1                        | < 0.5                                 | < 10                                   | 1        |
| BZM55B5V1   | 5                                 | 5.20  | < 60   | < 550  | 5                        | - 0.02                  | 0.02   | 1                        | < 0.1                                 | < 2                                    | 1        |
| BZM55B5V6   | 5.48                              | 5.72  | < 40   | < 450  | 5                        | - 0.05                  | 0.05   | 1                        | < 0.1                                 | < 2                                    | 1        |
| BZM55B6V2   | 6.08                              | 6.32  | < 10   | < 200  | 5                        | 0.03                    | 0.06   | 1                        | < 0.1                                 | < 2                                    | 2        |
| BZM55B6V8   | 6.66                              | 6.94  | < 8  | < 150  | 5                        | 0.03                    | 0.07   | 1                        | < 0.1                                 | < 2                                    | 3        |
| BZM55B7V5   | 7.35                              | 7.65  | < 7  | < 50   | 5                        | 0.03                    | 0.07   | 1                        | < 0.1                                 | < 2                                    | 5        |
| BZM55B8V2   | 8.04                              | 8.36  | < 7  | < 50   | 5                        | 0.03                    | 0.08   | 1                        | < 0.1                                 | < 2                                    | 6.2      |
| BZM55B9V1 * | 8.92                              | 9.28  | < 10   | < 50   | 5                        | 0.03                    | 0.09   | 1                        | < 0.1                                 | < 2                                    | 6.8      |
| BZM55B10 *  | 9.8                               | 10.20 | < 15   | < 70   | 5                        | 0.03                    | 0.1    | 1                        | < 0.1                                 | < 2                                    | 7.5      |
| BZM55B11 *  | 10.78                             | 11.22 | < 20   | < 70   | 5                        | 0.03                    | 0.11   | 1                        | < 0.1                                 | < 2                                    | 8.2      |
| BZM55B12 *  | 11.76                             | 12.24 | < 20   | < 90   | 5                        | 0.03                    | 0.11   | 1                        | < 0.1                                 | < 2                                    | 9.1      |
| BZM55B13 *  | 12.74                             | 13.26 | < 26   | < 110  | 5                        | 0.03                    | 0.11   | 1                        | < 0.1                                 | < 2                                    | 10       |
| BZM55B15 *  | 14.7                              | 15.30 | < 30   | < 110  | 5                        | 0.03                    | 0.11   | 1                        | < 0.1                                 | < 2                                    | 11       |
| BZM55B16 *  | 15.7                              | 16.30 | < 40   | < 170  | 5                        | 0.03                    | 0.11   | 1                        | < 0.1                                 | < 2                                    | 12       |
| BZM55B18 *  | 17.64                             | 18.36 | < 50   | < 170  | 5                        | 0.03                    | 0.11   | 1                        | < 0.1                                 | < 2                                    | 13       |
| BZM55B20 *  | 19.6                              | 20.40 | < 55   | < 220  | 5                        | 0.03                    | 0.11   | 1                        | < 0.1                                 | < 2                                    | 15       |
| BZM55B22 *  | 21.55                             | 22.45 | < 55   | < 220  | 5                        | 0.04                    | 0.12   | 1                        | < 0.1                                 | < 2                                    | 16       |
| BZM55B24 *  | 23.5                              | 24.5  | < 80   | < 220  | 5                        | 0.04                    | 0.12   | 1                        | < 0.1                                 | < 2                                    | 18       |
| BZM55B27 *  | 26.4                              | 27.6  | < 80   | < 220  | 5                        | 0.04                    | 0.12   | 1                        | < 0.1                                 | < 2                                    | 20       |
| BZM55B30 *  | 29.4                              | 30.6  | < 80   | < 220  | 5                        | 0.04                    | 0.12   | 1                        | < 0.1                                 | < 2                                    | 22       |
| BZM55B33 *  | 32.4                              | 33.6  | < 80   | < 220  | 5                        | 0.04                    | 0.12   | 1                        | < 0.1                                 | < 2                                    | 24       |
| BZM55B36 *  | 35.3                              | 36.7  | < 80   | < 220  | 5                        | 0.04                    | 0.12   | 1                        | < 0.1                                 | < 2                                    | 27       |
| BZM55B39 *  | 38.2                              | 39.8  | < 90   | < 500  | 2.5                      | 0.04                    | 0.12   | 1                        | < 0.1                                 | < 5                                    | 30       |
| BZM55B43 *  | 42.1                              | 43.9  | < 90   | < 600  | 2.5                      | 0.04                    | 0.12   | 0.5                      | < 0.1                                 | < 5                                    | 33       |
| BZM55B47 *  | 46.1                              | 47.9  | < 110  | < 700  | 2.5                      | 0.04                    | 0.12   | 0.5                      | < 0.1                                 | < 5                                    | 36       |
| BZM55B51 *  | 50                                | 52.0  | < 125  | < 700  | 2.5                      | 0.04                    | 0.12   | 0.5                      | < 0.1                                 | < 10                                   | 39       |
| BZM55B56 *  | 54.9                              | 57.1  | < 135  | < 1000                                       | 2.5                      | 0.04                    | 0.12   | 0.5                      | < 0.1                                 | < 10                                   | 43       |
| BZM55B62 *  | 60.8                              | 63.2  | < 150  | < 1000                                       | 2.5                      | 0.04                    | 0.12   | 0.5                      | < 0.1                                 | < 10                                   | 47       |
| BZM55B68 *  | 66.6                              | 69.4  | < 200  | < 1000                                       | 2.5                      | 0.04                    | 0.12   | 0.5                      | < 0.1                                 | < 10                                   | 51       |
| BZM55C75 *  | 73.5                              | 76.5  | < 250  | < 1500                                       | 2.5                      | 0.04                    | 0.12   | 0.5                      | < 0.1                                 | < 10                                   | 56       |

<sup>1)</sup>  $t_p \leq 10\text{ ms}$ ,  $T/t_p > 1000$

<sup>\*)</sup> Additional measurement of Voltage group 9V1 to 75 at 95 %  $V_{zmin} \leq 35\text{ nA}$  at  $T_j 25^\circ\text{C}$

### Typical Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

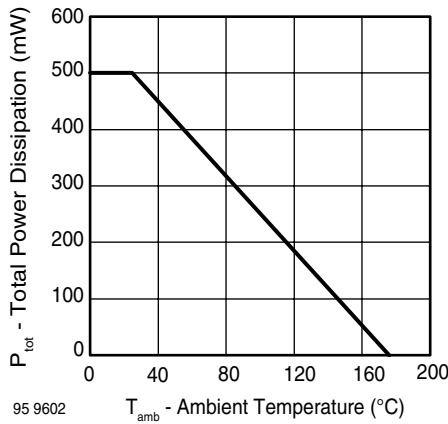


Figure 1. Total Power Dissipation vs. Ambient Temperature

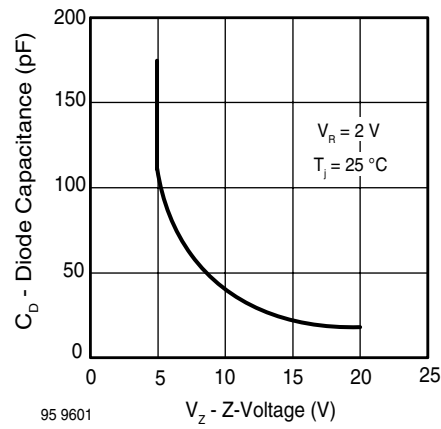


Figure 4. Diode Capacitance vs. Z-Voltage

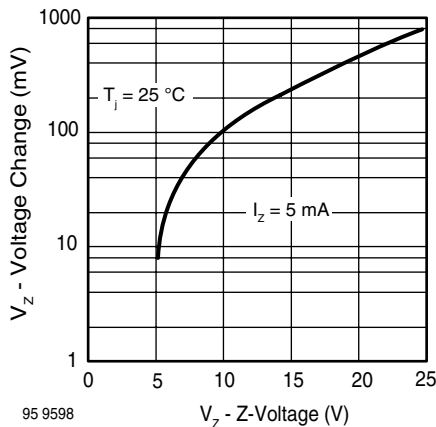


Figure 2. Typical Change of Working Voltage under Operating Conditions at  $T_{amb}=25\text{ }^{\circ}\text{C}$

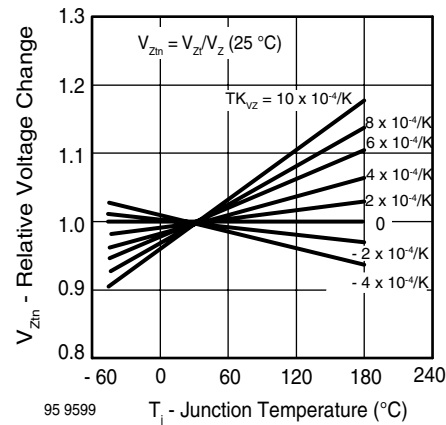


Figure 5. Typical Change of Working Voltage vs. Junction Temperature

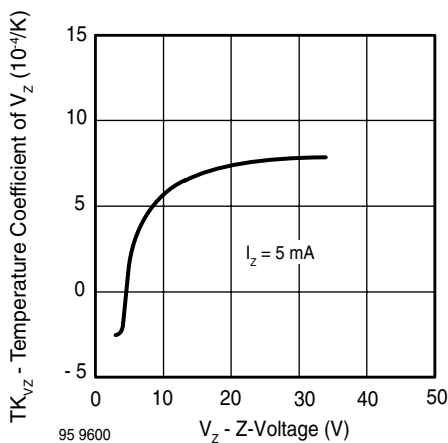


Figure 3. Temperature Coefficient of  $V_z$  vs. Z-Voltage

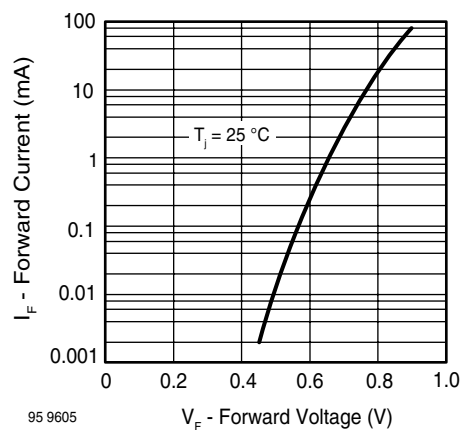


Figure 6. Forward Current vs. Forward Voltage

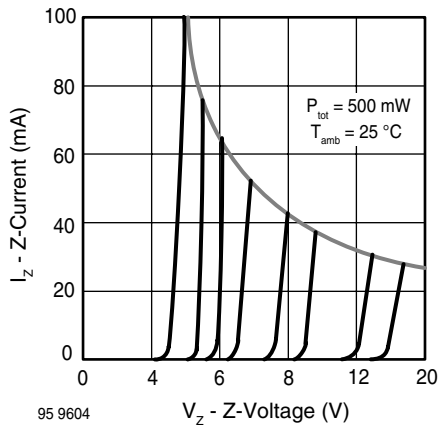


Figure 7. Z-Current vs. Z-Voltage

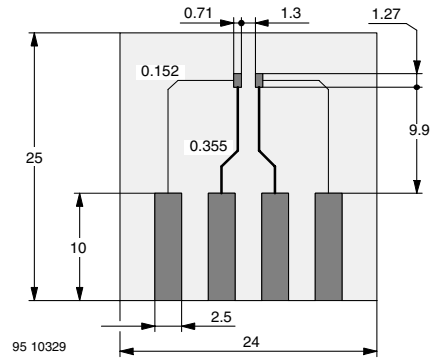


Figure 10. Board for  $R_{thJA}$  definition (in mm)

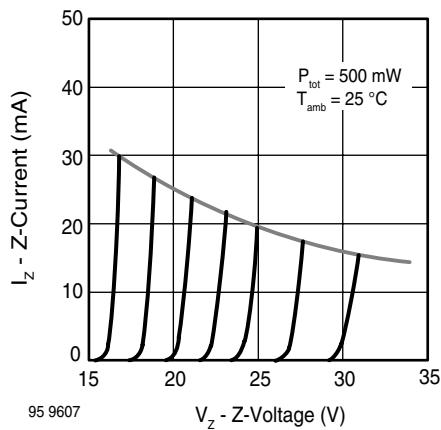


Figure 8. Z-Current vs. Z-Voltage

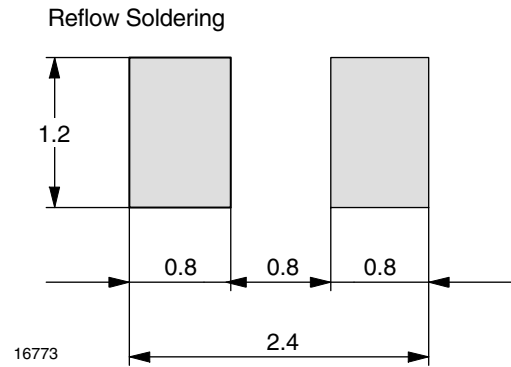


Figure 11. Recommended foot pads (in mm)

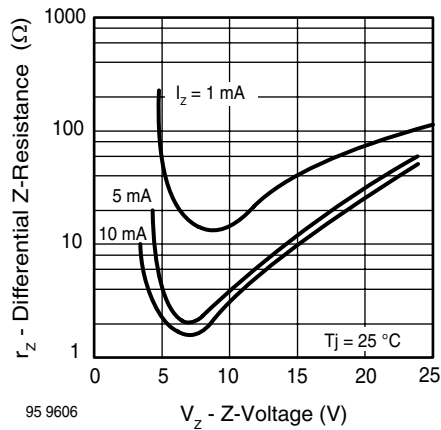


Figure 9. Differential Z-Resistance vs. Z-Voltage

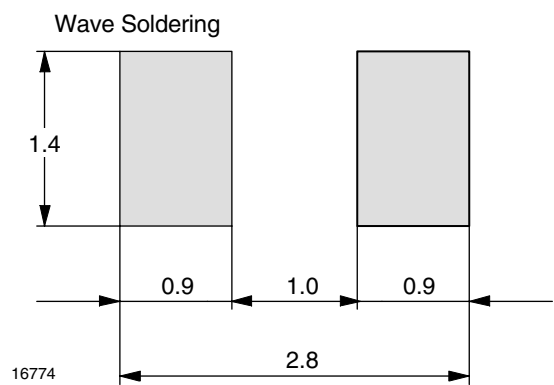


Figure 12. Recommended foot pads (in mm)

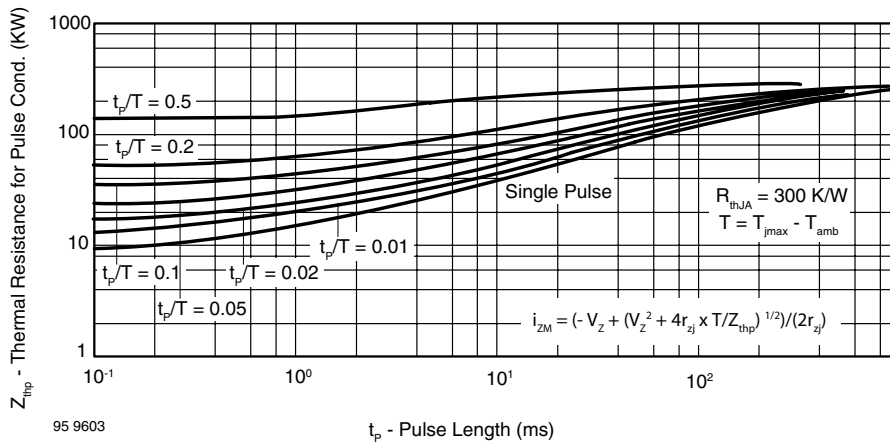
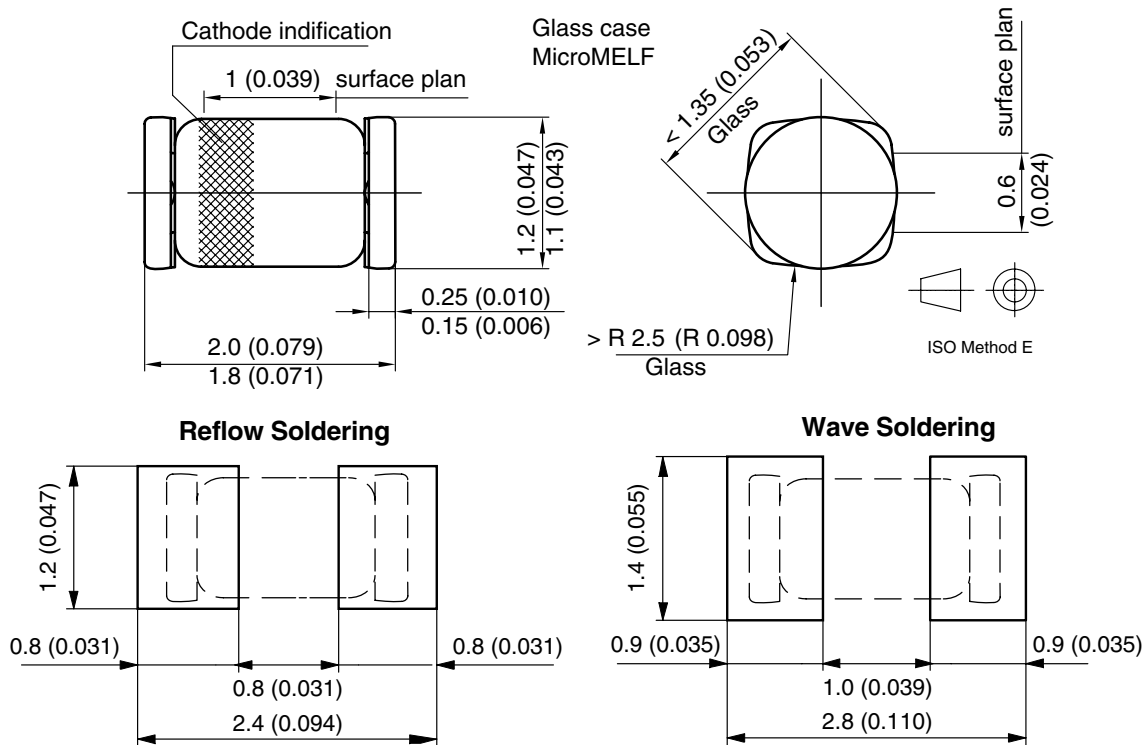


Figure 13. Thermal Response

## Package Dimensions in mm (Inches)



Document No.: 6.560-5007.01-4  
 Rev. 11, 07.Feb.2005  
 9612072



## Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

We reserve the right to make changes to improve technical design  
and may do so without further notice.

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany



## Disclaimer

All product specifications and data are subject to change without notice.

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