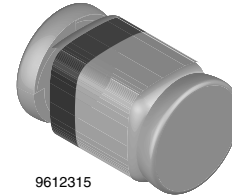


## Small Signal Zener Diodes

### Features

- Saving space
- Hermetic sealed parts
- Electrical data identical with the devices BZT55..Series/TZM..Series
- Fits onto SOD-323/SOD-110 footprints
- Very sharp reverse characteristic
- Low reverse current level
- Very high stability
- Low noise
- Available with tighter tolerances
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



### 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..

| Part number | Zener voltage range <sup>1)</sup> |      | Dynamic resistance                          |                                             | Test current | Temperature coefficient |        | Test current | Reverse leakage current               |                                        |          |
|-------------|-----------------------------------|------|---------------------------------------------|---------------------------------------------|--------------|-------------------------|--------|--------------|---------------------------------------|----------------------------------------|----------|
|             | $V_Z$ at $I_{ZT}$                 |      | $r_{zT}$ at $I_{ZT}$ ,<br>$f = 1\text{kHz}$ | $r_{zK}$ at $I_{ZK}$ ,<br>$f = 1\text{kHz}$ | $I_{ZT}$     | $TK_{VZ}$               |        | $I_{ZK}$     | $I_R$ at $T_{amb} = 25^\circ\text{C}$ | $I_R$ at $T_{amb} = 150^\circ\text{C}$ | at $V_R$ |
|             | V                                 |      | $\Omega$                                    |                                             | mA           | %/K                     |        | mA           | $\mu\text{A}$                         |                                        | V        |
|             | min.                              | max. |                                             |                                             |              | min.                    | max.   |              |                                       |                                        |          |
| 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       |

Notes:

<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  $T_j 25^\circ\text{C}$

## Electrical Characteristics

### BZM55B..

| Part number | Zener voltage range <sup>1)</sup> |       | Dynamic resistance                           |                                              | Test current | Temperature coefficient |        | Test current | Reverse leakage current           |                                    |          |
|-------------|-----------------------------------|-------|----------------------------------------------|----------------------------------------------|--------------|-------------------------|--------|--------------|-----------------------------------|------------------------------------|----------|
|             | $V_Z$ at $I_{ZT}$                 |       | $r_{zT}$ at $I_{ZT}$ ,<br>$f = 1\text{ kHz}$ | $r_{zK}$ at $I_{ZK}$ ,<br>$f = 1\text{ kHz}$ | $I_{ZT}$     | $TK_{VZ}$               |        | $I_{ZK}$     | $I_R$ at $T_{amb} = 25\text{ °C}$ | $I_R$ at $T_{amb} = 150\text{ °C}$ | at $V_R$ |
|             | V                                 |       | $\Omega$                                     |                                              | mA           | %/K                     |        | mA           | $\mu\text{A}$                     |                                    | V        |
|             | min.                              | max.  |                                              |                                              |              | min.                    | max.   |              |                                   |                                    |          |
| 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       |
| BZM55B75 *  | 73.5                              | 76.5  | < 250                                        | < 1500                                       | 2.5          | 0.04                    | 0.12   | 0.5          | < 0.1                             | < 10                               | 56       |

Notes:

<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  $T_j 25\text{ °C}$

## Typical Characteristics

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

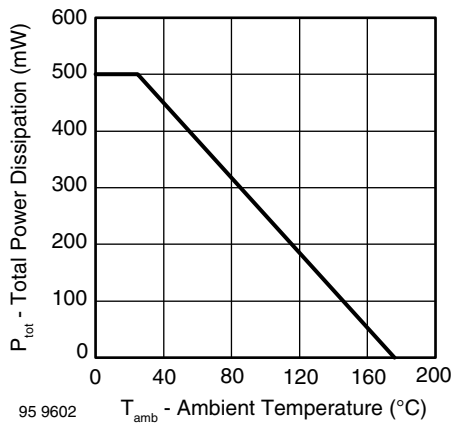


Figure 1. Total Power Dissipation vs. Ambient Temperature

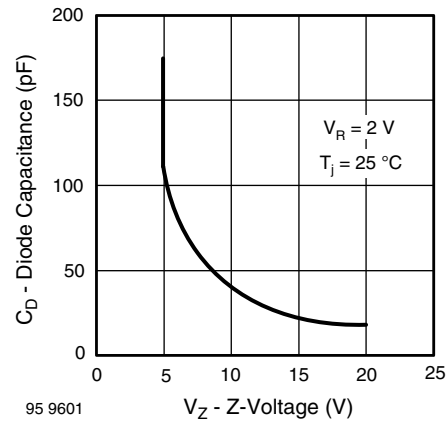


Figure 4. Diode Capacitance vs. Z-Voltage

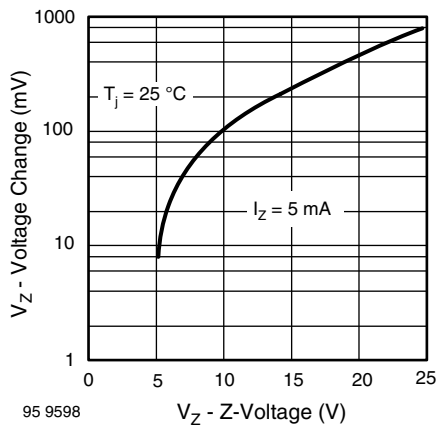


Figure 2. Typical Change of Working Voltage under Operating Conditions at  $T_{amb}=25^{\circ}\text{C}$

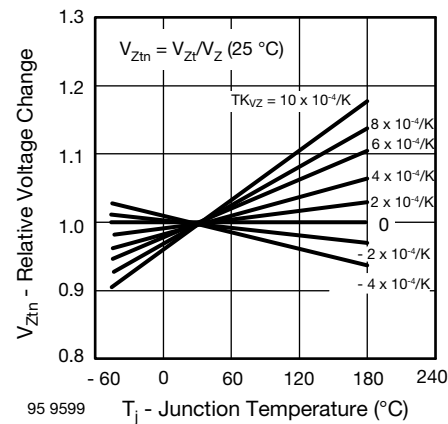


Figure 5. Typical Change of Working Voltage vs. Junction Temperature

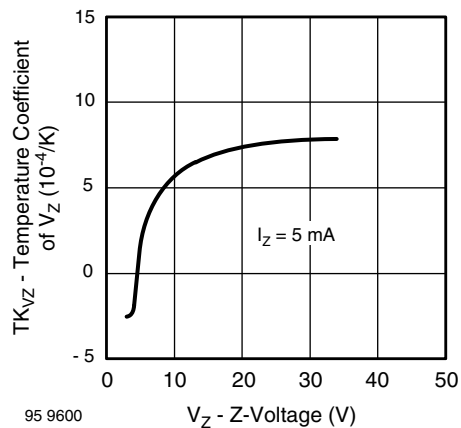


Figure 3. Temperature Coefficient of  $V_Z$  vs. Z-Voltage

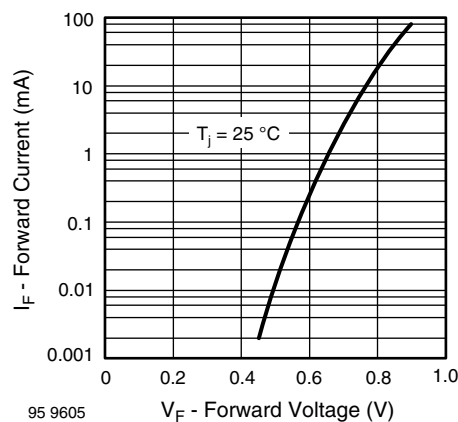


Figure 6. Forward Current vs. Forward Voltage

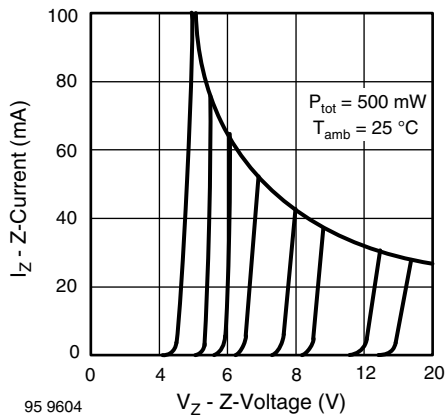


Figure 7. Z-Current vs. Z-Voltage

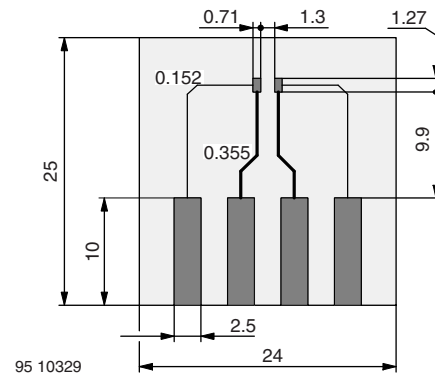


Figure 10. Board for  $R_{thJA}$  Definition (in mm)

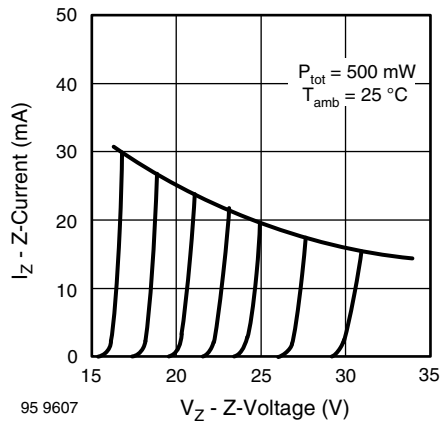


Figure 8. Z-Current vs. Z-Voltage

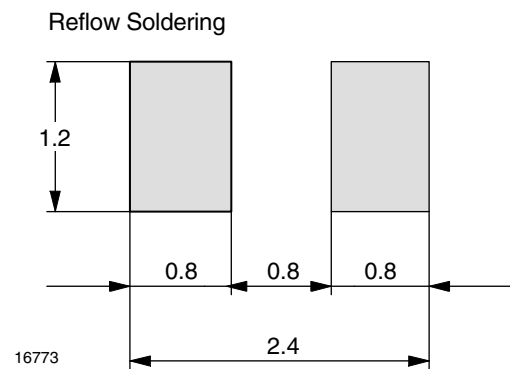


Figure 11. Recommended Foot Pads (in mm)

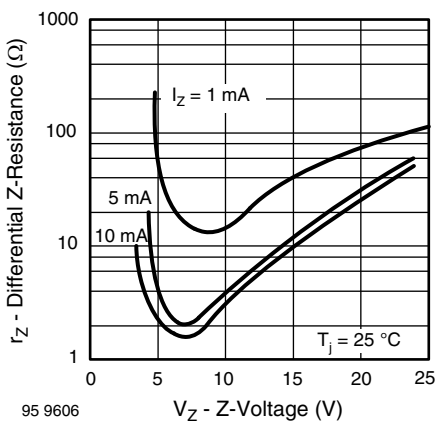


Figure 9. Differential Z-Resistance vs. Z-Voltage

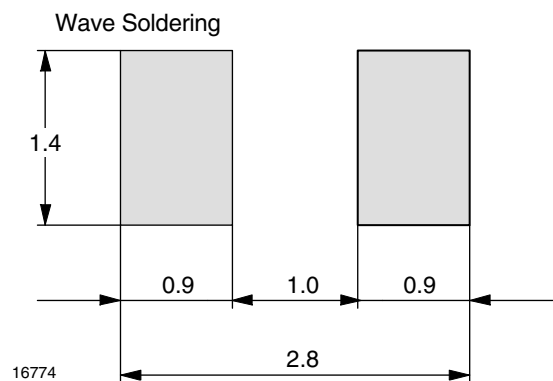
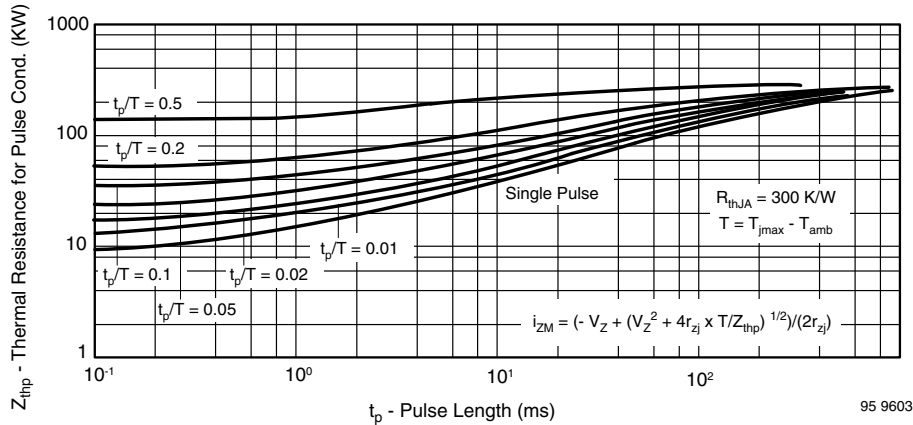
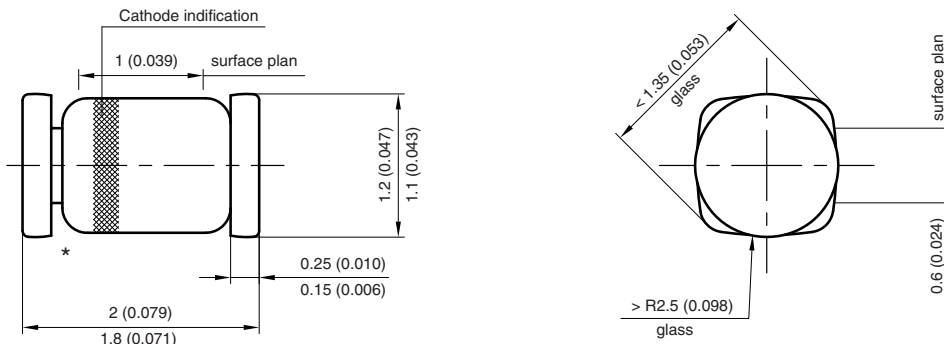


Figure 12. Recommended Foot Pads (in mm)

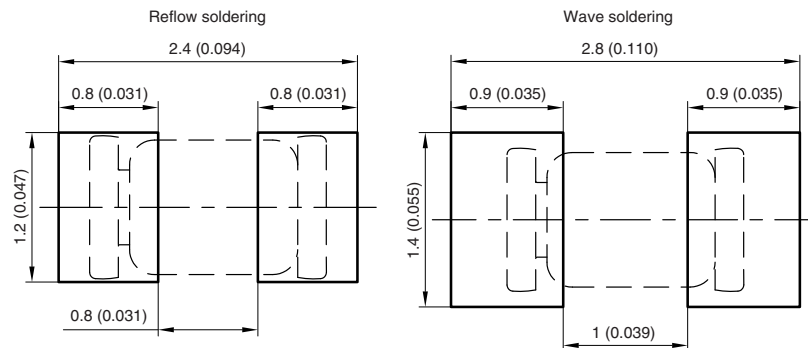


## Package Dimensions in millimeters (inches): MicroMELF



\* The gap between plug and glass can be either on cathode or anode side

Foot print recommendation:



Created - Date: 26.July.1996  
Rev. 13 - Date: 07.June.2006  
Document no.: 6.560-5007.01-4  
96 12072



## Disclaimer

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