

## Small Signal Zener Diodes



### FEATURES

- Very sharp reverse characteristic
- Low reverse current level
- Very high stability
- Low noise
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
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Available

### APPLICATIONS

- Voltage stabilization

| PRIMARY CHARACTERISTICS      |               |      |
|------------------------------|---------------|------|
| PARAMETER                    | VALUE         | UNIT |
| V <sub>Z</sub> range nom.    | 2.4 to 75     | V    |
| Test current I <sub>ZT</sub> | 2.5 to 5      | mA   |
| V <sub>Z</sub> specification | Pulse current |      |
| Circuit configuration        | Single        |      |

| ORDERING INFORMATION |                   |                      |                        |
|----------------------|-------------------|----------------------|------------------------|
| DEVICE NAME          | ORDERING CODE     | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
| BZT55-series         | BZT55-series-GS18 | 10 000 per 13" reel  | 10 000/box             |
| BZT55-series         | BZT55-series-GS08 | 2500 per 7" reel     | 12 500/box             |

| PACKAGE             |        |                                      |                                      |                          |
|---------------------|--------|--------------------------------------|--------------------------------------|--------------------------|
| PACKAGE NAME        | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL           | SOLDERING CONDITIONS     |
| QuadroMELF (SOD-80) | 34 mg  | UL 94 V-0                            | MSL level 1<br>(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> ≤ 300 K/W        | P <sub>tot</sub>  | 500                            | mW   |
| Zener current   |                                    | I <sub>Z</sub>    | P <sub>V</sub> /V <sub>Z</sub> | mA   |
| Junction to ambient air   | On PC board 50 mm x 50 mm x 1.6 mm | R <sub>thJA</sub> | 500                            | K/W  |
| Junction temperature  |                                    | T <sub>j</sub>    | 175                            | °C   |
| Storage temperature range   |                                    | T <sub>stg</sub>  | -65 to +175                    | °C   |
| Forward voltage (max.)  | I <sub>F</sub> = 200 mA            | V <sub>F</sub>    | 1.5                            | V    |



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                    |      |      |              |           |                         |       |     |                    |                       |                         |       |
|--|------------------------------------|------|------|--------------|-----------|-------------------------|-------|-----|--------------------|-----------------------|-------------------------|-------|
| PART NUMBER  | ZENER VOLTAGE RANGE <sup>(1)</sup> |      |      | TEST CURRENT |           | REVERSE LEAKAGE CURRENT |       |     | DYNAMIC RESISTANCE |                       | TEMPERATURE COEFFICIENT |       |
|  | $V_z$ at $I_{ZT1}$                 |      |      | $I_{ZT1}$    | $I_{ZT2}$ | $I_R$ at $V_R$          |       |     | $Z_z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $TK_{Vz}$               |       |
|  | V                                  |      |      | mA           |           | $\mu\text{A}$           |       | V   | $\Omega$           |                       |                         |       |
|  | MIN.                               | NOM. | MAX. |              |           |                         |       |     | MAX.               | MAX.                  | MIN.                    | MAX.  |
| BZT55C2V4  | 2.28                               | 2.4  | 2.56 | 5            | 1         | < 50                    | < 100 | 1   | < 85               | < 600                 | -0.09                   | -0.06 |
| BZT55C2V7  | 2.5                                | 2.7  | 2.9  | 5            | 1         | < 10                    | < 50  | 1   | < 85               | < 600                 | -0.09                   | -0.06 |
| BZT55C3V0  | 2.8                                | 3.0  | 3.2  | 5            | 1         | < 4                     | < 40  | 1   | < 90               | < 600                 | -0.08                   | -0.05 |
| BZT55C3V3  | 3.1                                | 3.3  | 3.5  | 5            | 1         | < 2                     | < 40  | 1   | < 90               | < 600                 | -0.08                   | -0.05 |
| BZT55C3V6  | 3.4                                | 3.6  | 3.8  | 5            | 1         | < 2                     | < 40  | 1   | < 90               | < 600                 | -0.08                   | -0.05 |
| BZT55C3V9  | 3.7                                | 3.9  | 4.1  | 5            | 1         | < 2                     | < 40  | 1   | < 90               | < 600                 | -0.08                   | -0.05 |
| BZT55C4V3  | 4                                  | 4.3  | 4.6  | 5            | 1         | < 1                     | < 20  | 1   | < 90               | < 600                 | -0.06                   | -0.03 |
| BZT55C4V7  | 4.4                                | 4.7  | 5    | 5            | 1         | < 0.5                   | < 10  | 1   | < 80               | < 600                 | -0.05                   | 0.02  |
| BZT55C5V1  | 4.8                                | 5.1  | 5.4  | 5            | 1         | < 0.1                   | < 2   | 1   | < 60               | < 550                 | -0.02                   | 0.02  |
| BZT55C5V6  | 5.2                                | 5.6  | 6    | 5            | 1         | < 0.1                   | < 2   | 1   | < 40               | < 450                 | -0.05                   | 0.05  |
| BZT55C6V2  | 5.8                                | 6.2  | 6.6  | 5            | 1         | < 0.1                   | < 2   | 2   | < 10               | < 200                 | 0.03                    | 0.06  |
| BZT55C6V8  | 6.4                                | 6.8  | 7.2  | 5            | 1         | < 0.1                   | < 2   | 3   | < 8                | < 150                 | 0.03                    | 0.07  |
| BZT55C7V5  | 7                                  | 7.5  | 7.9  | 5            | 1         | < 0.1                   | < 2   | 5   | < 7                | < 50                  | 0.03                    | 0.07  |
| BZT55C8V2  | 7.7                                | 8.2  | 8.7  | 5            | 1         | < 0.1                   | < 2   | 6.2 | < 7                | < 50                  | 0.03                    | 0.08  |
| BZT55C9V1  | 8.5                                | 9.1  | 9.6  | 5            | 1         | < 0.1                   | < 2   | 6.8 | < 10               | < 50                  | 0.03                    | 0.09  |
| BZT55C10   | 9.4                                | 10   | 10.6 | 5            | 1         | < 0.1                   | < 2   | 7.5 | < 15               | < 70                  | 0.03                    | 0.1   |
| BZT55C11   | 10.4                               | 11   | 11.6 | 5            | 1         | < 0.1                   | < 2   | 8.2 | < 20               | < 70                  | 0.03                    | 0.11  |
| BZT55C12   | 11.4                               | 12   | 12.7 | 5            | 1         | < 0.1                   | < 2   | 9.1 | < 20               | < 90                  | 0.03                    | 0.11  |
| BZT55C13   | 12.4                               | 13   | 14.1 | 5            | 1         | < 0.1                   | < 2   | 10  | < 26               | < 110                 | 0.03                    | 0.11  |
| BZT55C15   | 13.8                               | 15   | 15.6 | 5            | 1         | < 0.1                   | < 2   | 11  | < 30               | < 110                 | 0.03                    | 0.11  |
| BZT55C16   | 15.3                               | 16   | 17.1 | 5            | 1         | < 0.1                   | < 2   | 12  | < 40               | < 170                 | 0.03                    | 0.11  |
| BZT55C18   | 16.8                               | 18   | 19.1 | 5            | 1         | < 0.1                   | < 2   | 13  | < 50               | < 170                 | 0.03                    | 0.11  |
| BZT55C20   | 18.8                               | 20   | 21.2 | 5            | 1         | < 0.1                   | < 2   | 15  | < 55               | < 220                 | 0.03                    | 0.11  |
| BZT55C22   | 20.8                               | 22   | 23.3 | 5            | 1         | < 0.1                   | < 2   | 16  | < 55               | < 220                 | 0.04                    | 0.12  |
| BZT55C24   | 22.8                               | 24   | 25.6 | 5            | 1         | < 0.1                   | < 2   | 18  | < 80               | < 220                 | 0.04                    | 0.12  |
| BZT55C27   | 25.1                               | 27   | 28.9 | 5            | 1         | < 0.1                   | < 2   | 20  | < 80               | < 220                 | 0.04                    | 0.12  |
| BZT55C30   | 28                                 | 30   | 32   | 5            | 1         | < 0.1                   | < 2   | 22  | < 80               | < 220                 | 0.04                    | 0.12  |
| BZT55C33   | 31                                 | 33   | 35   | 5            | 1         | < 0.1                   | < 2   | 24  | < 80               | < 220                 | 0.04                    | 0.12  |
| BZT55C36   | 34                                 | 36   | 38   | 5            | 1         | < 0.1                   | < 2   | 27  | < 80               | < 220                 | 0.04                    | 0.12  |
| BZT55C39   | 37                                 | 39   | 41   | 2.5          | 0.5       | < 0.1                   | < 5   | 30  | < 90               | < 500                 | 0.04                    | 0.12  |
| BZT55C43   | 40                                 | 43   | 46   | 2.5          | 0.5       | < 0.1                   | < 5   | 33  | < 90               | < 600                 | 0.04                    | 0.12  |
| BZT55C47   | 44                                 | 47   | 50   | 2.5          | 0.5       | < 0.1                   | < 5   | 36  | < 110              | < 700                 | 0.04                    | 0.12  |
| BZT55C51   | 48                                 | 51   | 54   | 2.5          | 0.5       | < 0.1                   | < 10  | 39  | < 125              | < 700                 | 0.04                    | 0.12  |
| BZT55C56   | 52                                 | 56   | 60   | 2.5          | 0.5       | < 0.1                   | < 10  | 43  | < 135              | < 1000                | 0.04                    | 0.12  |
| BZT55C62   | 58                                 | 62   | 66   | 2.5          | 0.5       | < 0.1                   | < 10  | 47  | < 150              | < 1000                | 0.04                    | 0.12  |
| BZT55C68   | 64                                 | 68   | 72   | 2.5          | 0.5       | < 0.1                   | < 10  | 51  | < 200              | < 1000                | 0.04                    | 0.12  |
| BZT55C75   | 70                                 | 75   | 79   | 2.5          | 0.5       | < 0.1                   | < 10  | 56  | < 250              | < 1500                | 0.04                    | 0.12  |

**Notes**

- Additional measurement of voltage group 9V1 to 75 at 95 %  $V_{zmin.} \leq 35\text{ nA}$  at  $T_j 25\text{ }^{\circ}\text{C}$
- <sup>(1)</sup>  $t_p \leq 10\text{ ms}$ ,  $T/t_p > 1000$



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                    |      |       |              |           |  |       |   |                    |                       |                         |       |
|--|------------------------------------|------|-------|--------------|-----------|--|-------|---|--------------------|-----------------------|-------------------------|-------|
| PART NUMBER  | ZENER VOLTAGE RANGE <sup>(1)</sup> |      |       | TEST CURRENT |           | REVERSE LEAKAGE CURRENT                |       |   | DYNAMIC RESISTANCE |                       | TEMPERATURE COEFFICIENT |       |
|  | $V_z$ at $I_{ZT1}$                 |      |       | $I_{ZT1}$    | $I_{ZT2}$ | $I_R$ at $V_R$                         |       |   | $Z_z$ at $I_{ZT1}$ | $Z_{zk}$ at $I_{ZT2}$ | $TK_{Vz}$               |       |
|  | V                                  |      |       | mA           |           | $T_{amb} = 25\text{ }^{\circ}\text{C}$ |       | $T_{amb} = 150\text{ }^{\circ}\text{C}$ | f = 1 kHz          |                       |                         |       |
|  | MIN.                               | NOM. | MAX.  |              |           | $\mu\text{A}$                          |       | V                                       | $\Omega$           |                       | MIN.                    | MAX.  |
| BZT55B2V4  | 2.35                               | 2.4  | 2.45  | 5            | 1         | < 50                                   | < 100 | 1                                       | < 85               | < 600                 | -0.09                   | -0.06 |
| BZT55B2V7  | 2.64                               | 2.7  | 2.76  | 5            | 1         | < 10                                   | < 50  | 1                                       | < 85               | < 600                 | -0.09                   | -0.06 |
| BZT55B3V0  | 2.94                               | 3.0  | 3.06  | 5            | 1         | < 4                                    | < 40  | 1                                       | < 90               | < 600                 | -0.08                   | -0.05 |
| BZT55B3V3  | 3.24                               | 3.3  | 3.36  | 5            | 1         | < 2                                    | < 40  | 1                                       | < 90               | < 600                 | -0.08                   | -0.05 |
| BZT55B3V6  | 3.52                               | 3.6  | 3.68  | 5            | 1         | < 2                                    | < 40  | 1                                       | < 90               | < 600                 | -0.08                   | -0.05 |
| BZT55B3V9  | 3.82                               | 3.9  | 3.98  | 5            | 1         | < 2                                    | < 40  | 1                                       | < 90               | < 600                 | -0.08                   | -0.05 |
| BZT55B4V3  | 4.22                               | 4.3  | 4.38  | 5            | 1         | < 1                                    | < 20  | 1                                       | < 90               | < 600                 | -0.06                   | -0.03 |
| BZT55B4V7  | 4.6                                | 4.7  | 4.8   | 5            | 1         | < 0.5                                  | < 10  | 1                                       | < 80               | < 600                 | -0.05                   | 0.02  |
| BZT55B5V1  | 5                                  | 5.1  | 5.2   | 5            | 1         | < 0.1                                  | < 2   | 1                                       | < 60               | < 550                 | -0.02                   | 0.02  |
| BZT55B5V6  | 5.48                               | 5.6  | 5.72  | 5            | 1         | < 0.1                                  | < 2   | 1                                       | < 40               | < 450                 | -0.05                   | 0.05  |
| BZT55B6V2  | 6.08                               | 6.2  | 6.32  | 5            | 1         | < 0.1                                  | < 2   | 2                                       | < 10               | < 200                 | 0.03                    | 0.06  |
| BZT55B6V8  | 6.66                               | 6.8  | 6.94  | 5            | 1         | < 0.1                                  | < 2   | 3                                       | < 8                | < 150                 | 0.03                    | 0.07  |
| BZT55B7V5  | 7.35                               | 7.5  | 7.65  | 5            | 1         | < 0.1                                  | < 2   | 5                                       | < 7                | < 50                  | 0.03                    | 0.07  |
| BZT55B8V2  | 8.04                               | 8.2  | 8.36  | 5            | 1         | < 0.1                                  | < 2   | 6.2                                     | < 7                | < 50                  | 0.03                    | 0.08  |
| BZT55B9V1  | 8.92                               | 9.1  | 9.28  | 5            | 1         | < 0.1                                  | < 2   | 6.8                                     | < 10               | < 50                  | 0.03                    | 0.09  |
| BZT55B10   | 9.8                                | 10   | 10.2  | 5            | 1         | < 0.1                                  | < 2   | 7.5                                     | < 15               | < 70                  | 0.03                    | 0.1   |
| BZT55B11   | 10.78                              | 11   | 11.22 | 5            | 1         | < 0.1                                  | < 2   | 8.2                                     | < 20               | < 70                  | 0.03                    | 0.11  |
| BZT55B12   | 11.76                              | 12   | 12.24 | 5            | 1         | < 0.1                                  | < 2   | 9.1                                     | < 20               | < 90                  | 0.03                    | 0.11  |
| BZT55B13   | 12.74                              | 13   | 13.26 | 5            | 1         | < 0.1                                  | < 2   | 10                                      | < 26               | < 110                 | 0.03                    | 0.11  |
| BZT55B15   | 14.7                               | 15   | 15.3  | 5            | 1         | < 0.1                                  | < 2   | 11                                      | < 30               | < 110                 | 0.03                    | 0.11  |
| BZT55B16   | 15.7                               | 16   | 16.3  | 5            | 1         | < 0.1                                  | < 2   | 12                                      | < 40               | < 170                 | 0.03                    | 0.11  |
| BZT55B18   | 17.64                              | 18   | 18.36 | 5            | 1         | < 0.1                                  | < 2   | 13                                      | < 50               | < 170                 | 0.03                    | 0.11  |
| BZT55B20   | 19.6                               | 20   | 20.4  | 5            | 1         | < 0.1                                  | < 2   | 15                                      | < 55               | < 220                 | 0.03                    | 0.11  |
| BZT55B22   | 21.55                              | 22   | 22.45 | 5            | 1         | < 0.1                                  | < 2   | 16                                      | < 55               | < 220                 | 0.04                    | 0.12  |
| BZT55B24   | 23.5                               | 24   | 24.5  | 5            | 1         | < 0.1                                  | < 2   | 18                                      | < 80               | < 220                 | 0.04                    | 0.12  |
| BZT55B27   | 26.4                               | 27   | 27.6  | 5            | 1         | < 0.1                                  | < 2   | 20                                      | < 80               | < 220                 | 0.04                    | 0.12  |
| BZT55B30   | 29.4                               | 30   | 30.6  | 5            | 1         | < 0.1                                  | < 2   | 22                                      | < 80               | < 220                 | 0.04                    | 0.12  |
| BZT55B33   | 32.4                               | 33   | 33.6  | 5            | 1         | < 0.1                                  | < 2   | 24                                      | < 80               | < 220                 | 0.04                    | 0.12  |
| BZT55B36   | 35.3                               | 36   | 36.7  | 5            | 1         | < 0.1                                  | < 2   | 27                                      | < 80               | < 220                 | 0.04                    | 0.12  |
| BZT55B39   | 38.2                               | 39   | 39.8  | 2.5          | 1         | < 0.1                                  | < 5   | 30                                      | < 90               | < 500                 | 0.04                    | 0.12  |
| BZT55B43   | 42.1                               | 43   | 43.9  | 2.5          | 0.5       | < 0.1                                  | < 5   | 33                                      | < 90               | < 600                 | 0.04                    | 0.12  |
| BZT55B47   | 46.1                               | 47   | 47.9  | 2.5          | 0.5       | < 0.1                                  | < 5   | 36                                      | < 110              | < 700                 | 0.04                    | 0.12  |
| BZT55B51   | 50                                 | 51   | 52    | 2.5          | 0.5       | < 0.1                                  | < 10  | 39                                      | < 125              | < 700                 | 0.04                    | 0.12  |
| BZT55B56   | 54.9                               | 56   | 57.1  | 2.5          | 0.5       | < 0.1                                  | < 10  | 43                                      | < 135              | < 1000                | 0.04                    | 0.12  |
| BZT55B62   | 60.8                               | 62   | 63.2  | 2.5          | 0.5       | < 0.1                                  | < 10  | 47                                      | < 150              | < 1000                | 0.04                    | 0.12  |
| BZT55B68   | 66.6                               | 68   | 69.4  | 2.5          | 0.5       | < 0.1                                  | < 10  | 51                                      | < 200              | < 1000                | 0.04                    | 0.12  |
| BZT55B75   | 73.5                               | 75   | 76.5  | 2.5          | 0.5       | < 0.1                                  | < 10  | 56                                      | < 250              | < 1500                | 0.04                    | 0.12  |

**Notes**

- Additional measurement of voltage group 9V1 to 75 at 95 %  $V_{zmin.} \leq 35\text{ nA}$  at  $T_j 25\text{ }^{\circ}\text{C}$
- (1)  $t_p \leq 10\text{ ms}$ ,  $T/t_p > 1000$

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

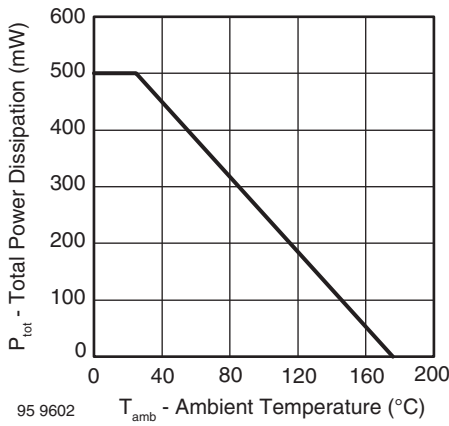


Fig. 1 - Total Power Dissipation vs. Ambient Temperature

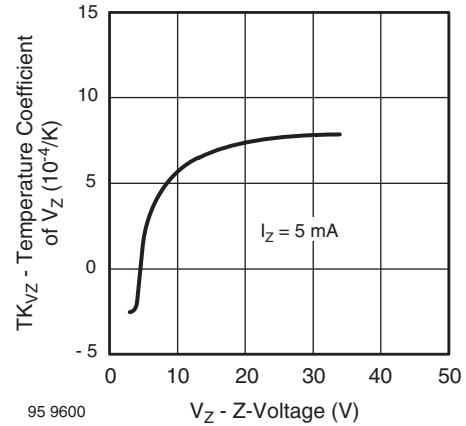


Fig. 4 - Temperature Coefficient of  $V_Z$  vs. Z-Voltage

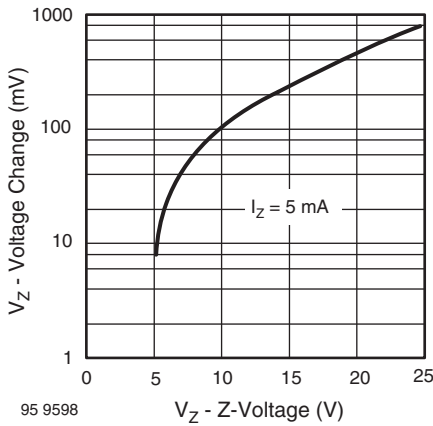


Fig. 2 - Typical Change of Working Voltage under Operating Conditions at  $T_{amb} = 25\text{ }^{\circ}\text{C}$

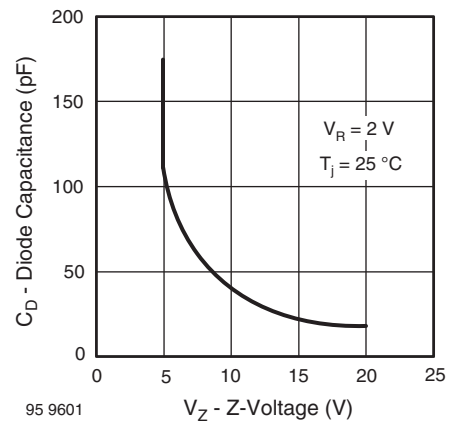


Fig. 5 - Diode Capacitance vs. Z-Voltage

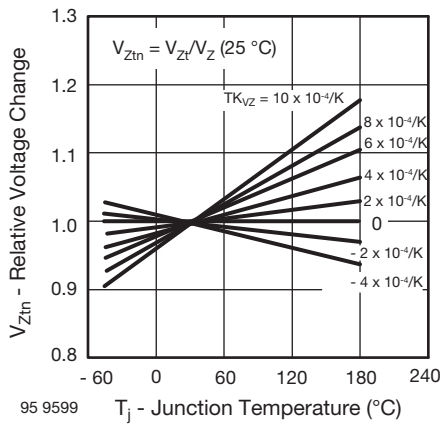


Fig. 3 - Typical Change of Working Voltage vs. Junction Temperature

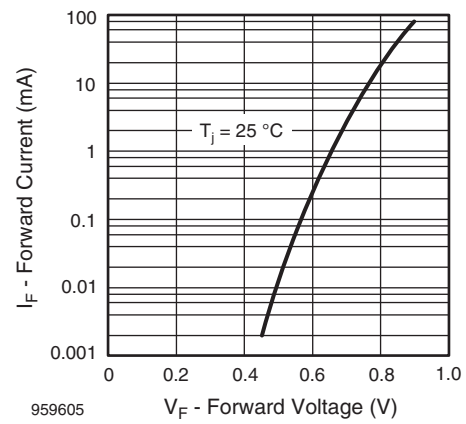


Fig. 6 - Forward Current vs. Forward Voltage

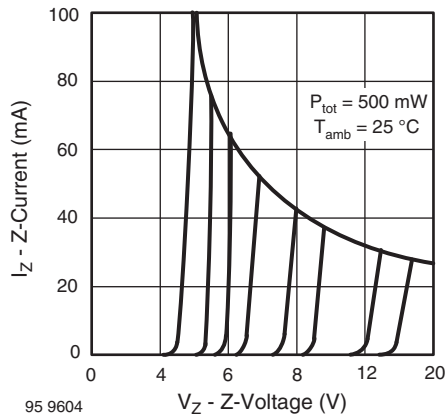


Fig. 7 - Z-Current vs. Z-Voltage

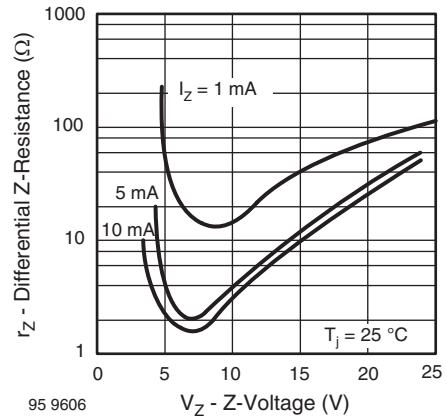


Fig. 9 - Differential Z-Resistance vs. Z-Voltage

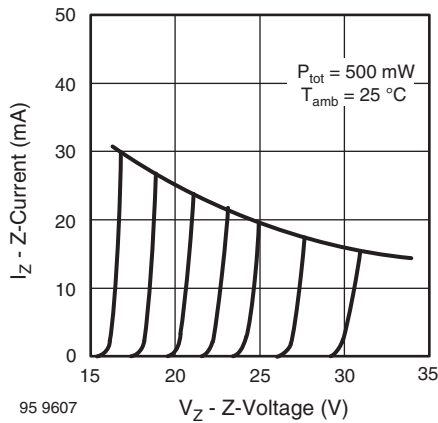


Fig. 8 - Z-Current vs. Z-Voltage

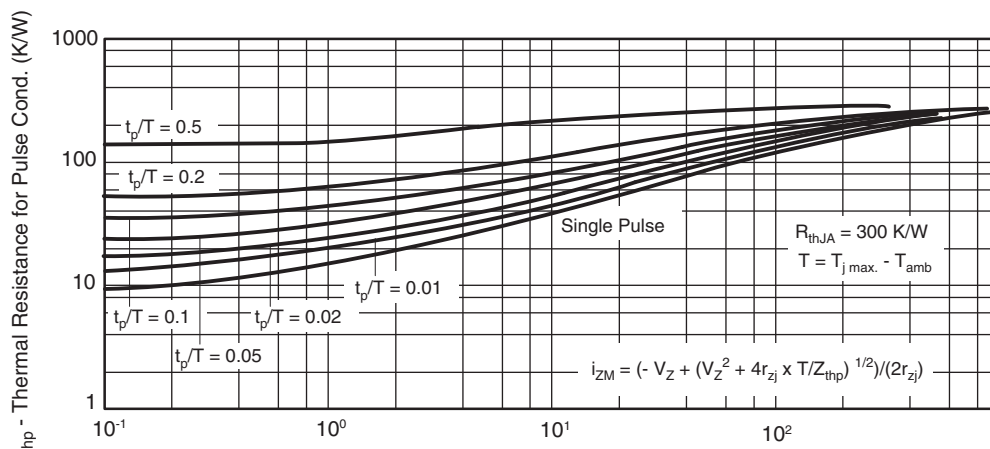
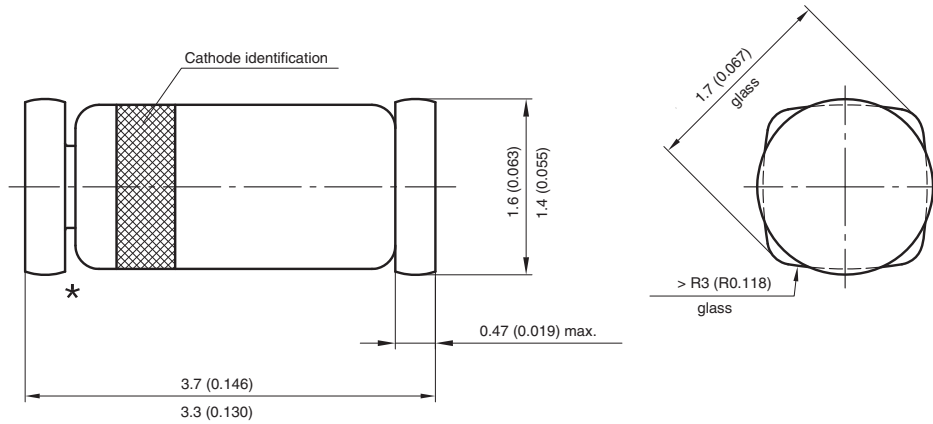


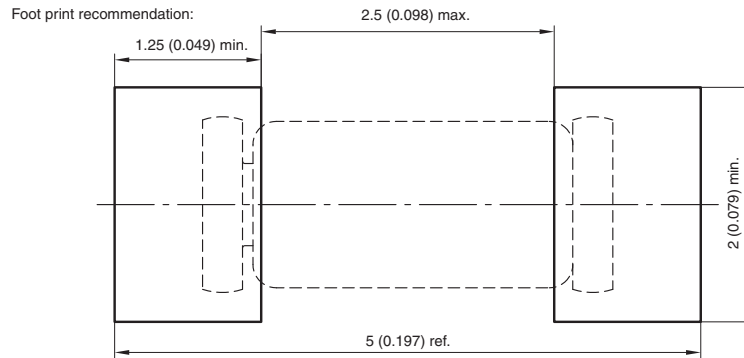
Fig. 10 - Thermal Response



### PACKAGE DIMENSIONS in millimeters (inches): **QuadroMELF SOD-80**



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



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96 12071



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