



# BZX55 Series

Zener Diodes

Zener Voltage Range: 0.8, 2.4 to 200 Volts Power Dissipation: 500mW

## Features

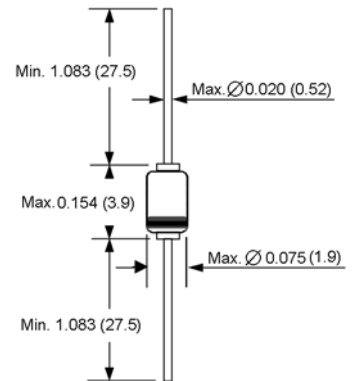
- ◆ Silicon Planar Power Zener Diodes.
- ◆ The Zener voltages are graded according to the international E 24 standard. Standard Zener voltage tolerance is  $\pm 5\%$ . Replace suffix "C" with "B" for  $\pm 2\%$  tolerance. Other voltage tolerances and other Zener voltages are available upon request.



DO-204AH (DO-35 Glass)

## Mechanical Data

- ◆ Case: DO-35 Glass Case
- ◆ Weight: approx. 0.13g



Dimensions in inches and (millimeters)

## Maximum Ratings and Thermal Characteristics

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Parameter   | Symbol          | Value              | Unit               |
|---|-----------------|--------------------|--------------------|
| Zener current (see Table "Characteristics")       |                 |                    |                    |
| Power dissipation at $T_{amb} = 25^\circ\text{C}$ | $P_{tot}$       | 500 <sup>(1)</sup> | mW                 |
| Thermal resistance junction to ambient air        | $R_{\theta JA}$ | 300 <sup>(1)</sup> | $^\circ\text{C/W}$ |
| Junction temperature                              | $T_j$           | 175                | $^\circ\text{C}$   |
| Storage temperature range                         | $T_s$           | -55 to +175        | $^\circ\text{C}$   |

**Notes:** 1. Valid provided that leads at a distance of 3/8" from case are kept at ambient temperature.

# Electrical Characteristics

(T<sub>A</sub>=25°C unless otherwise noted) Maximum V<sub>F</sub>=1.0V at I<sub>F</sub>=100mA

| Type number<br>y=C for +5%<br>y=B for +2% | Dynamic resistance                                      |   | Temp. coefficient of zener voltage at I <sub>Z</sub> =5mA<br>α <sub>VZ</sub> (% / °C) |        | Reverse leakage current                             |  |                                 | Admissible zener current <sup>(2)</sup><br>I <sub>ZM</sub> (mA) |
|---|---|---|---|--------|---|--|---------------------------------|---|
|   | at I <sub>Z</sub> =5mA<br>f=1kHz<br>r <sub>Zj</sub> (Ω) | at I <sub>Z</sub> =1mA<br>f=1kHz<br>r <sub>Zj</sub> (Ω) | Min.  | Max.   | at<br>T <sub>amb</sub> =25°C<br>I <sub>R</sub> (nA) | at<br>T <sub>amb</sub> =150°C<br>I <sub>R</sub> (μA) | at<br>V <sub>R</sub><br>(Volts) |   |
|   |   |   |   |        |   |  |                                 |   |
| BZX55 - y0V8 <sup>(3)</sup>               | < 8   | < 600   | - 0.25  | -      | -   | -  | -                               | -   |
| BZX55 - y2V4                              | < 85  | < 600   | - 0.08  | - 0.06 | < 50000   | < 100  | 1                               | 145   |
| BZX55 - y2V7                              | < 85  | < 600   | - 0.08  | - 0.06 | < 10000   | < 50   | 1                               | 135   |
| BZX55 - y3V0                              | < 85  | < 600   | - 0.08  | - 0.06 | < 4000  | < 40   | 1                               | 125   |
| BZX55 - y3V3                              | < 85  | < 600   | - 0.08  | - 0.05 | < 2000  | < 40   | 1                               | 115   |
| BZX55 - y3V6                              | < 85  | < 600   | - 0.08  | - 0.04 | < 2000  | < 40   | 1                               | 105   |
| BZX55 - y3V9                              | < 85  | < 600   | - 0.07  | - 0.03 | < 2000  | < 40   | 1                               | 95  |
| BZX55 - y4V3                              | < 75  | < 600   | - 0.04  | - 0.01 | < 1000  | < 20   | 1                               | 90  |
| BZX55 - y4V7                              | < 60  | < 600   | - 0.03  | + 0.01 | < 500   | < 10   | 1                               | 85  |
| BZX55 - y5V1                              | < 35  | < 550   | - 0.02  | + 0.05 | < 100   | < 2  | 1                               | 80  |
| BZX55 - y5V6                              | < 25  | < 450   | - 0.01  | + 0.06 | < 100   | < 2  | 1                               | 70  |
| BZX55 - y6V2                              | < 10  | < 200   | 0   | + 0.07 | < 100   | < 2  | 2                               | 64  |
| BZX55 - y6V8                              | < 8   | < 150   | + 0.01  | + 0.08 | < 100   | < 2  | 3                               | 58  |
| BZX55 - y7V5                              | < 7   | < 50  | + 0.01  | + 0.09 | < 100   | < 2  | 5                               | 53  |
| BZX55 - y8V2                              | < 7   | < 50  | + 0.01  | + 0.09 | < 100   | < 2  | 6.2                             | 47  |
| BZX55 - y9V1                              | < 10  | < 50  | + 0.02  | + 0.10 | < 100   | < 2  | 6.8                             | 43  |
| BZX55 - y10                               | < 15  | < 70  | + 0.03  | + 0.11 | < 100   | < 2  | 7.5                             | 40  |
| BZX55 - y11                               | < 20  | < 70  | + 0.03  | + 0.11 | < 100   | < 2  | 8.2                             | 36  |
| BZX55 - y12                               | < 20  | < 90  | + 0.03  | + 0.11 | < 100   | < 2  | 9.1                             | 32  |
| BZX55 - y13                               | < 26  | < 110   | + 0.03  | + 0.11 | < 100   | < 2  | 10                              | 29  |
| BZX55 - y15                               | < 30  | < 110   | + 0.03  | + 0.11 | < 100   | < 2  | 11                              | 27  |
| BZX55 - y16                               | < 40  | < 170   | + 0.03  | + 0.11 | < 100   | < 2  | 12                              | 24  |
| BZX55 - y18                               | < 50  | < 170   | + 0.03  | + 0.11 | < 100   | < 2  | 13                              | 21  |
| BZX55 - y20                               | < 55  | < 220   | + 0.03  | + 0.11 | < 100   | < 2  | 15                              | 20  |
| BZX55 - y22                               | < 55  | < 220   | + 0.03  | + 0.11 | < 100   | < 2  | 16                              | 18  |
| BZX55 - y24                               | < 80  | < 220   | + 0.04  | + 0.12 | < 100   | < 2  | 18                              | 16  |
| BZX55 - y27                               | < 80  | < 220   | + 0.04  | + 0.12 | < 100   | < 2  | 20                              | 14  |
| BZX55 - y30                               | < 80  | < 220   | + 0.04  | + 0.12 | < 100   | < 2  | 22                              | 13  |
| BZX55 - y33                               | < 80  | < 220   | + 0.04  | + 0.12 | < 100   | < 2  | 24                              | 12  |
| BZX55 - y36                               | < 80  | < 220   | + 0.04  | + 0.12 | < 100   | < 2  | 27                              | 11  |
| BZX55 - y39                               | < 90 <sup>(4)</sup>                                     | < 500 <sup>(5)</sup>                                    | + 0.04  | + 0.12 | < 100   | < 5  | 30                              | 10  |
| BZX55 - y43                               | < 90 <sup>(4)</sup>                                     | < 600 <sup>(5)</sup>                                    | + 0.04  | + 0.12 | < 100   | < 5  | 33                              | 9.2   |
| BZX55 - y47                               | < 110 <sup>(4)</sup>                                    | < 700 <sup>(5)</sup>                                    | + 0.04  | + 0.12 | < 100   | < 5  | 36                              | 8.5   |
| BZX55 - y51                               | < 125 <sup>(4)</sup>                                    | < 700 <sup>(5)</sup>                                    | + 0.04  | + 0.12 | < 100   | < 10   | 39                              | 7.8   |
| BZX55 - y56                               | < 135 <sup>(4)</sup>                                    | < 1000 <sup>(5)</sup>                                   | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 43                              | 7.0   |
| BZX55 - y62                               | < 150 <sup>(4)</sup>                                    | < 1000 <sup>(5)</sup>                                   | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 47                              | 6.4   |
| BZX55 - y68                               | < 200 <sup>(4)</sup>                                    | < 1000 <sup>(5)</sup>                                   | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 51                              | 5.9   |
| BZX55 - y75                               | < 250 <sup>(4)</sup>                                    | < 1500 <sup>(5)</sup>                                   | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 56                              | 5.3   |
| BZX55 - y82                               | < 300 <sup>(4)</sup>                                    | < 2000 <sup>(5)</sup>                                   | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 62                              | 4.8   |
| BZX55 - y91                               | < 450 <sup>(6)</sup>                                    | < 5000 <sup>(7)</sup>                                   | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 68                              | 4.4   |
| BZX55 - y100                              | < 450 <sup>(6)</sup>                                    | < 5000 <sup>(7)</sup>                                   | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 75                              | 4.0   |
| BZX55 - y110                              | < 600   | < 5000  | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 82                              | -   |
| BZX55 - y120                              | < 800   | < 5500  | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 91                              | -   |
| BZX55 - y130                              | < 950   | < 6000  | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 100                             | -   |
| BZX55 - y150                              | < 1250  | < 6500  | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 110                             | -   |
| BZX55 - y160                              | < 1400  | < 7000  | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 120                             | -   |
| BZX55 - y180                              | < 1700  | < 8500  | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 130                             | -   |
| BZX55 - y200                              | < 2000  | < 10000   | typ. +0.1 <sup>(4)</sup>  |        | < 100   | < 10   | 150                             | -   |

Notes: 1. Tested with pulses t<sub>p</sub>=5 ms

2. Valid provided that leads are kept at ambient temperature at a distance of 8 mm from case

3. The BZX55 - C0V8 is a silicon diode with operation in forward direction. Hence, the index of all parameters should be "F" instead of "Z". Connect the cathode lead to the negative pole.

4. at I<sub>Z</sub>=2.5 mA

5. at I<sub>Z</sub>=0.5 mA

6. at I<sub>Z</sub>=1.0 mA

7. at I<sub>Z</sub>=0.1 mA

# Electrical Characteristics

(T<sub>A</sub>=25°C unless otherwise noted) Maximum V<sub>F</sub>=1.0V at I<sub>F</sub>=100mA

| Type number<br>±5% Tol.   | Zener voltage range <sup>(1)</sup> at I <sub>ZT1</sub> (mA)<br>V <sub>Z</sub> (Volts) |      | Test current<br>I <sub>ZT1</sub> (mA) |
|---------------------------|---|------|---------------------------------------|
|                           | Min.  | Max. |                                       |
| BZX55-C0V8 <sup>(3)</sup> | 0.73  | 0.83 | 5.0                                   |
| BZX55-C2V4                | 2.28  | 2.56 | 5.0                                   |
| BZX55-C2V7                | 2.50  | 2.90 | 5.0                                   |
| BZX55-C3V0                | 2.80  | 3.20 | 5.0                                   |
| BZX55-C3V3                | 3.10  | 3.50 | 5.0                                   |
| BZX55-C3V6                | 3.40  | 3.90 | 5.0                                   |
| BZX55-C3V9                | 3.70  | 4.10 | 5.0                                   |
| BZX55-C4V3                | 4.00  | 4.60 | 5.0                                   |
| BZX55-C4V7                | 4.40  | 5.00 | 5.0                                   |
| BZX55-C5V1                | 4.80  | 5.40 | 5.0                                   |
| BZX55-C5V6                | 5.20  | 6.00 | 5.0                                   |
| BZX55-C6V2                | 5.80  | 6.60 | 5.0                                   |
| BZX55-C6V8                | 6.40  | 7.20 | 5.0                                   |
| BZX55-C7V5                | 7.00  | 7.90 | 5.0                                   |
| BZX55-C8V2                | 7.70  | 8.70 | 5.0                                   |
| BZX55-C9V1                | 8.50  | 9.60 | 5.0                                   |
| BZX55-C10                 | 9.40  | 10.6 | 5.0                                   |
| BZX55-C11                 | 10.4  | 11.6 | 5.0                                   |
| BZX55-C12                 | 11.4  | 12.7 | 5.0                                   |
| BZX55-C13                 | 12.4  | 14.1 | 5.0                                   |
| BZX55-C15                 | 13.8  | 15.6 | 5.0                                   |
| BZX55-C16                 | 15.3  | 17.1 | 5.0                                   |
| BZX55-C18                 | 16.8  | 19.1 | 5.0                                   |
| BZX55-C20                 | 18.8  | 21.2 | 5.0                                   |
| BZX55-C22                 | 20.8  | 23.3 | 5.0                                   |
| BZX55-C24                 | 22.8  | 25.6 | 5.0                                   |
| BZX55-C27                 | 25.1  | 28.9 | 5.0                                   |
| BZX55-C30                 | 28.0  | 32.0 | 5.0                                   |
| BZX55-C33                 | 31.0  | 35.0 | 5.0                                   |
| BZX55-C36                 | 34.0  | 38.0 | 5.0                                   |
| BZX55-C39                 | 37.0  | 41.0 | 2.5                                   |
| BZX55-C43                 | 40.0  | 46.0 | 2.5                                   |
| BZX55-C47                 | 44.0  | 50.0 | 2.5                                   |
| BZX55-C51                 | 48.0  | 54.0 | 2.5                                   |
| BZX55-C56                 | 52.0  | 60.0 | 2.5                                   |
| BZX55-C62                 | 58.0  | 66.0 | 2.5                                   |
| BZX55-C68                 | 64.0  | 72.0 | 2.5                                   |
| BZX55-C75                 | 70.0  | 80.0 | 2.5                                   |
| BZX55-C82                 | 77.0  | 87.0 | 2.5                                   |
| BZX55-C91                 | 85.0  | 96.0 | 1.0                                   |
| BZX55-C100                | 94.0  | 106  | 1.0                                   |
| BZX55-C110                | 104   | 116  | 1.0                                   |
| BZX55-C120                | 114   | 127  | 1.0                                   |
| BZX55-C130                | 124   | 141  | 1.0                                   |
| BZX55-C150                | 138   | 156  | 1.0                                   |
| BZX55-C160                | 153   | 171  | 1.0                                   |
| BZX55-C180                | 168   | 191  | 1.0                                   |
| BZX55-C200                | 188   | 212  | 1.0                                   |

| Type number<br>±2% Tol.   | Zener voltage range <sup>(1)</sup> at I <sub>ZT1</sub> (mA)<br>V <sub>Z</sub> (Volts) |      | Test current<br>I <sub>ZT1</sub> (mA) |
|---------------------------|---|------|---------------------------------------|
|                           | Min.  | Max. |                                       |
| BZX55-B0V8 <sup>(3)</sup> | 0.78  | 0.82 | 5.0                                   |
| BZX55-B2V7                | 2.35  | 2.45 | 5.0                                   |
| BZX55-B3                  | 2.65  | 2.75 | 5.0                                   |
| BZX55-B3V0                | 2.94  | 3.06 | 5.0                                   |
| BZX55-B3V3                | 3.23  | 3.37 | 5.0                                   |
| BZX55-B3V6                | 3.53  | 3.67 | 5.0                                   |
| BZX55-B3V9                | 3.82  | 3.98 | 5.0                                   |
| BZX55-B4V3                | 4.21  | 4.39 | 5.0                                   |
| BZX55-B4V7                | 4.61  | 4.79 | 5.0                                   |
| BZX55-B5V1                | 5.00  | 5.20 | 5.0                                   |
| BZX55-B5V6                | 5.49  | 5.71 | 5.0                                   |
| BZX55-B6V2                | 6.08  | 6.32 | 5.0                                   |
| BZX55-B6V8                | 6.66  | 6.94 | 5.0                                   |
| BZX55-B7V5                | 7.35  | 7.65 | 5.0                                   |
| BZX55-B8V2                | 8.04  | 8.36 | 5.0                                   |
| BZX55-B9V1                | 8.92  | 9.28 | 5.0                                   |
| BZX55-B10                 | 9.80  | 10.2 | 5.0                                   |
| BZX55-B11                 | 10.8  | 11.2 | 5.0                                   |
| BZX55-B12                 | 11.8  | 12.2 | 5.0                                   |
| BZX55-B13                 | 12.7  | 13.3 | 5.0                                   |
| BZX55-B15                 | 14.7  | 15.3 | 5.0                                   |
| BZX55-B16                 | 15.7  | 16.3 | 5.0                                   |
| BZX55-B18                 | 17.6  | 18.4 | 5.0                                   |
| BZX55-B20                 | 19.6  | 20.4 | 5.0                                   |
| BZX55-B22                 | 21.6  | 22.4 | 5.0                                   |
| BZX55-B24                 | 23.5  | 24.5 | 5.0                                   |
| BZX55-B27                 | 26.5  | 27.5 | 5.0                                   |
| BZX55-B30                 | 29.4  | 30.6 | 5.0                                   |
| BZX55-B33                 | 32.3  | 33.7 | 5.0                                   |
| BZX55-B36                 | 35.3  | 36.7 | 5.0                                   |
| BZX55-B39                 | 38.2  | 39.8 | 2.5                                   |
| BZX55-B43                 | 42.1  | 43.9 | 2.5                                   |
| BZX55-B47                 | 46.1  | 47.9 | 2.5                                   |
| BZX55-B51                 | 50.0  | 52.0 | 2.5                                   |
| BZX55-B56                 | 54.9  | 56.9 | 2.5                                   |
| BZX55-B62                 | 60.8  | 63.2 | 2.5                                   |
| BZX55-B68                 | 66.6  | 69.4 | 2.5                                   |
| BZX55-B75                 | 73.5  | 76.5 | 2.5                                   |
| BZX55-B82                 | 80.4  | 83.6 | 2.5                                   |
| BZX55-B91                 | 89.2  | 92.8 | 1.0                                   |
| BZX55-B100                | 98.0  | 102  | 1.0                                   |
| BZX55-B110                | 108   | 112  | 1.0                                   |
| BZX55-B120                | 118   | 122  | 1.0                                   |
| BZX55-B130                | 127   | 133  | 1.0                                   |
| BZX55-B150                | 147   | 153  | 1.0                                   |
| BZX55-B160                | 157   | 163  | 1.0                                   |
| BZX55-B180                | 176   | 184  | 1.0                                   |
| BZX55-B200                | 196   | 204  | 1.0                                   |

- Notes:**
1. Measured with pulses t<sub>r</sub>=5 ms
  2. The BZX55 - C0V8 is a silicon diode with operation in forward direction. Hence, the index of all parameters should be "F" instead of "Z". Connect the cathode lead to the negative pole.

# RATINGS AND CHARACTERISTIC CURVES

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

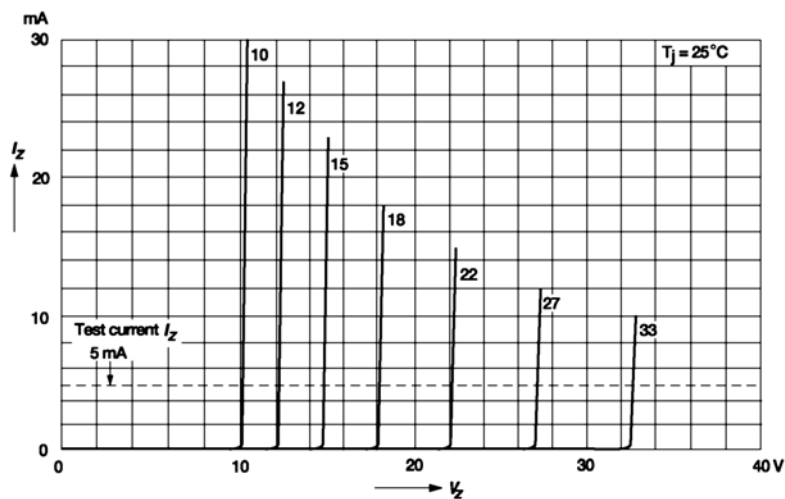
## Breakdown characteristics

at  $T_j = \text{constant}$  (pulsed)



## Breakdown characteristics

at  $T_j = \text{constant}$  (pulsed)

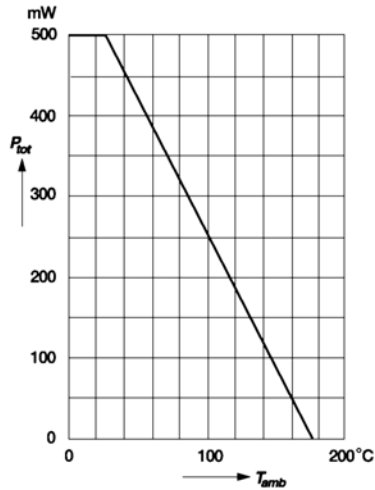


# RATINGS AND CHARACTERISTIC CURVES

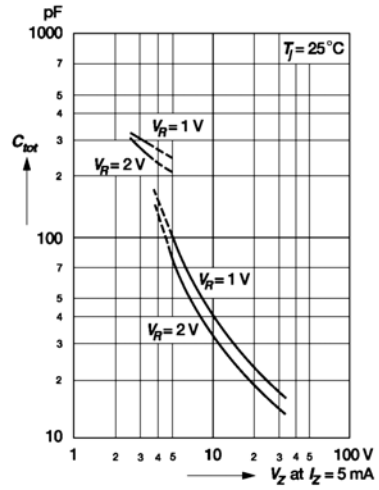
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

## Admissible power dissipation versus ambient temperature

Valid provided that leads are kept ambient temperature at a distance of 8 mm from case.

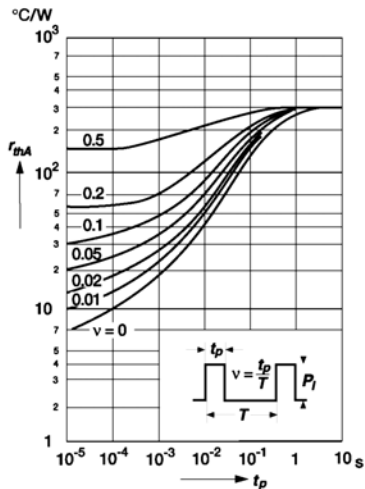


## Capacitance versus Zener voltage

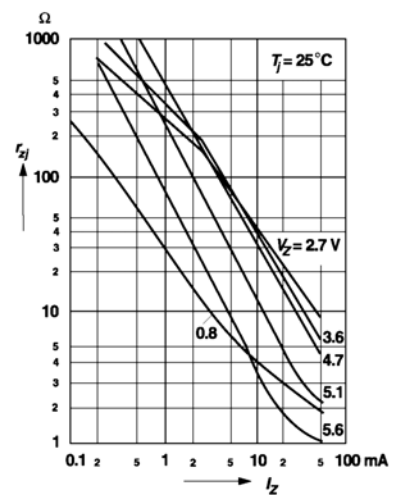


## Pulse thermal resistance versus pulse duration

Valid provided that leads are kept at ambient temperature at a distance of 8 mm from case.



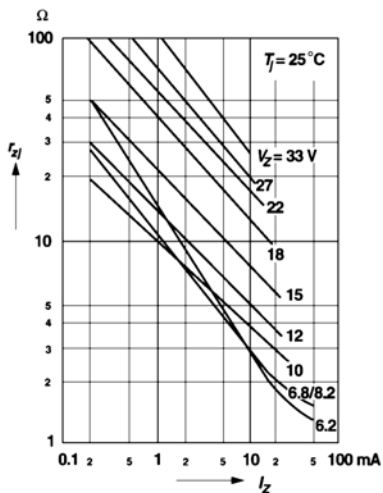
## Dynamic resistance versus Zener current



# RATINGS AND CHARACTERISTIC CURVES

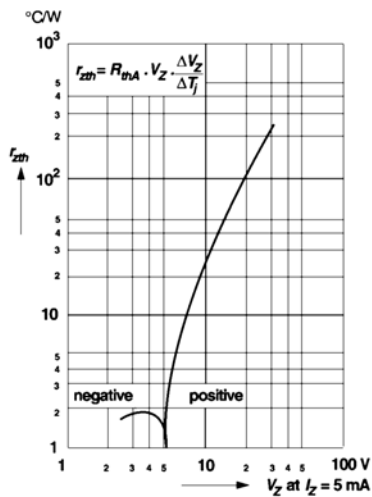
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Dynamic resistance versus Zener current**

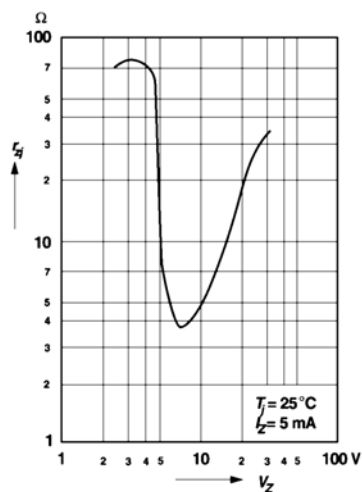


**Thermal differential resistance versus Zener voltage**

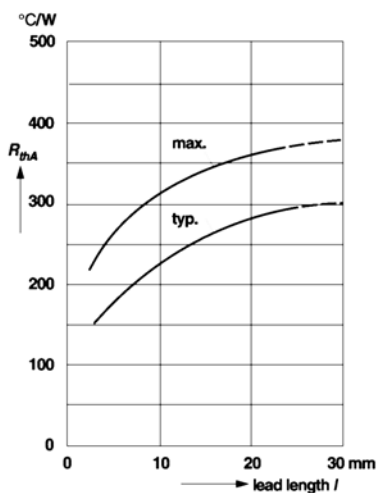
Valid provided that leads are kept at ambient temperature at a distance of 8 mm from case.



**Dynamic resistance versus Zener voltage**



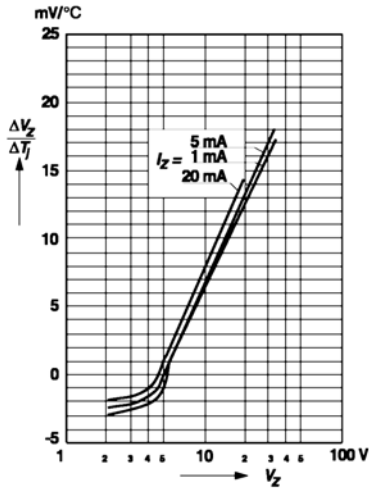
**Thermal resistance versus lead length**



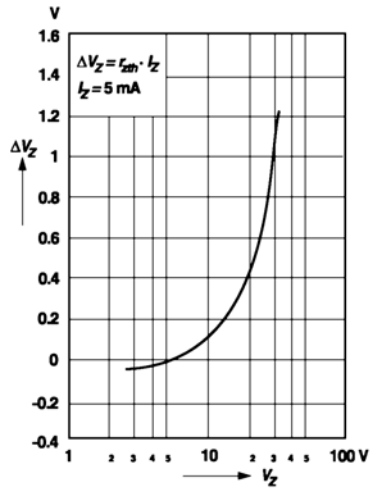
# RATINGS AND CHARACTERISTIC CURVES

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Temperature dependence of Zener voltage versus Zener voltage



Change of Zener voltage from turn-on up to the point of thermal equilibrium versus Zener voltage



Change of Zener voltage versus junction temperature

