

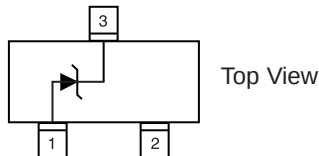
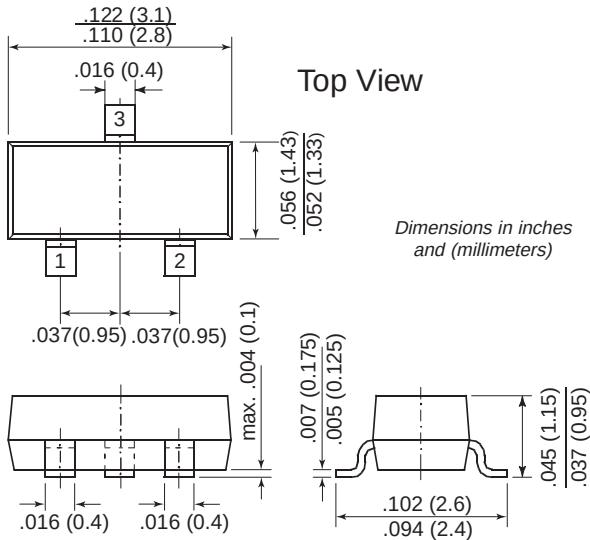
## Zener Diodes

Vz Range 2.4 to 75V

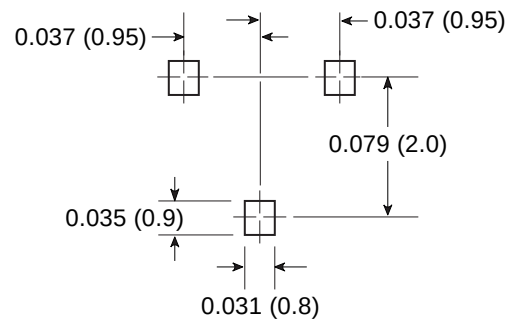
Power Dissipation 300mW



### TO-236AB (SOT-23)



### Mounting Pad Layout



## 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 "C" with "B" for  $\pm 2\%$  tolerance. Other voltage tolerances and other Zener voltages are available upon request.
- These diodes are also available in other case styles and other configurations including: the SOD-123 case with type designation BZT52 series, the dual zener diode common anode configuration in the SOT-23 case with type designation AZ23 series and the dual zener diode common cathode configuration in the SOT-23 case with type designation DZ23 series.

## Mechanical Data

**Case:** SOT-23 Plastic Package

**Weight:** Approx. 0.008g

**Packaging Codes/Options:**

E8/10K per 13" reel (8mm tape), 30K box

E9/3K per 7" reel (8mm tape), 30K box

## Maximum Ratings and Thermal Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

| Parameter                                    | Symbol           | Value              | Unit |
|----------------------------------------------|------------------|--------------------|------|
| Zener Current                                | I <sub>ZM</sub>  | 250                | mA   |
| Power Dissipation at T <sub>amb</sub> = 25°C | P <sub>tot</sub> | 300 <sup>(1)</sup> | mW   |
| Thermal Resistance Junction to Ambient Air   | R <sub>θJA</sub> | 420 <sup>(1)</sup> | °C/W |
| Junction Temperature                         | T <sub>j</sub>   | 150                | °C   |
| Storage Temperature Range                    | T <sub>s</sub>   | -65 to +150        | °C   |

**Notes:** (1) Device on fiberglass substrate, see layout.

### Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted) Maximum V<sub>F</sub> = 0.9V at I<sub>F</sub> = 10mA

| Type<br>y = C for 5%<br>y = B for 2% | Marking<br>Code | Dynamic<br>Resistance<br>at I <sub>ZT1</sub><br>r <sub>zj</sub> (Ω) | Temp. Coeffi-<br>cient of Zener<br>Voltage at I <sub>ZT1</sub><br>α <sub>VZ</sub> (10 <sup>-4</sup> /°C) | Test<br>Current<br>I <sub>ZT1</sub> (mA) | Dynamic<br>Resistance<br>at I <sub>ZT2</sub><br>r <sub>zj</sub> (Ω) | Test<br>Current<br>I <sub>ZT2</sub> (mA) | Reverse Leakage<br>Current |                          |
|--------------------------------------|-----------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------|------------------------------------------|----------------------------|--------------------------|
|                                      |                 |                                                                     |                                                                                                          |                                          |                                                                     |                                          | I <sub>R</sub> (μA)        | at<br>V <sub>R</sub> (V) |
| BZX84-y2V4                           | Z11             | 70 (≤100)                                                           | -9.0 ... -4.0                                                                                            | 5                                        | 275                                                                 | 1.0                                      | 50                         | 1.0                      |
| BZX84-y2V7                           | Z12             | 75 (≤100)                                                           | -9.0 ... -4.0                                                                                            | 5                                        | 300 (≤600)                                                          | 1.0                                      | 20                         | 1.0                      |
| BZX84-y3                             | Z13             | 80 (≤95)                                                            | -9.0 ... -3.0                                                                                            | 5                                        | 325 (≤600)                                                          | 1.0                                      | 10                         | 1.0                      |
| BZX84-y3V3                           | Z14             | 85 (≤95)                                                            | -8.0 ... -3.0                                                                                            | 5                                        | 350 (≤600)                                                          | 1.0                                      | 5.0                        | 1.0                      |
| BZX84-y3V6                           | Z15             | 85 (≤90)                                                            | -8.0 ... -3.0                                                                                            | 5                                        | 375 (≤600)                                                          | 1.0                                      | 5.0                        | 1.0                      |
| BZX84-y3V9                           | Z16             | 85 (≤90)                                                            | -7.0 ... -3.0                                                                                            | 5                                        | 400 (≤600)                                                          | 1.0                                      | 3.0                        | 1.0                      |
| BZX84-y4V3                           | Z17             | 80 (≤90)                                                            | -6.0 ... -1.0                                                                                            | 5                                        | 410 (≤600)                                                          | 1.0                                      | 3.0                        | 1.0                      |
| BZX84-y4V7                           | Z1              | 50 (≤80)                                                            | -5.0 ... +2.0                                                                                            | 5                                        | 425 (≤500)                                                          | 1.0                                      | 3.0                        | 2.0                      |
| BZX84-y5V1                           | Z2              | 40 (≤60)                                                            | -3.0 ... +4.0                                                                                            | 5                                        | 400 (≤480)                                                          | 1.0                                      | 2.0                        | 2.0                      |
| BZX84-y5V6                           | Z3              | 15 (≤40)                                                            | -2.0 ... +6.0                                                                                            | 5                                        | 80 (≤400)                                                           | 1.0                                      | 1.0                        | 2.0                      |
| BZX84-y6V2                           | Z4              | 6.0 (≤10)                                                           | -1.0 ... +7.0                                                                                            | 5                                        | 40 (≤150)                                                           | 1.0                                      | 3.0                        | 4.0                      |
| BZX84-y6V8                           | Z5              | 6.0 (≤15)                                                           | +2.0 ... +7.0                                                                                            | 5                                        | 30 (≤80)                                                            | 1.0                                      | 2.0                        | 4.0                      |
| BZX84-y7V5                           | Z6              | 6.0 (≤15)                                                           | +3.0 ... +7.0                                                                                            | 5                                        | 30 (≤80)                                                            | 1.0                                      | 1.0                        | 5.0                      |
| BZX84-y8V2                           | Z7              | 6.0 (≤15)                                                           | +4.0 ... +7.0                                                                                            | 5                                        | 40 (≤80)                                                            | 1.0                                      | 0.7                        | 5.0                      |
| BZX84-y9V1                           | Z8              | 6.0 (≤15)                                                           | +5.0 ... +8.0                                                                                            | 5                                        | 40 (≤100)                                                           | 1.0                                      | 0.5                        | 6.0                      |
| BZX84-y10                            | Z9              | 8.0 (≤20)                                                           | +5.0 ... +8.0                                                                                            | 5                                        | 50 (≤150)                                                           | 1.0                                      | 0.2                        | 7.0                      |
| BZX84-y11                            | Y1              | 10 (≤20)                                                            | +5.0 ... +9.0                                                                                            | 5                                        | 50 (≤150)                                                           | 1.0                                      | 0.1                        | 8.0                      |
| BZX84-y12                            | Y2              | 10 (≤25)                                                            | +6.0 ... +9.0                                                                                            | 5                                        | 50 (≤150)                                                           | 1.0                                      | 0.1                        | 8.0                      |
| BZX84-y13                            | Y3              | 10 (≤30)                                                            | +7.0 ... +9.0                                                                                            | 5                                        | 50 (≤170)                                                           | 1.0                                      | 0.1                        | 8.0                      |
| BZX84-y15                            | Y4              | 10 (≤30)                                                            | +7.0 ... +9.0                                                                                            | 5                                        | 50 (≤200)                                                           | 1.0                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y16                            | Y5              | 10 (≤40)                                                            | +8.0 ... +9.5                                                                                            | 5                                        | 50 (≤200)                                                           | 1.0                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y18                            | Y6              | 10 (≤45)                                                            | +8.0 ... +9.5                                                                                            | 5                                        | 50 (≤225)                                                           | 1.0                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y20                            | Y7              | 15 (≤55)                                                            | +8.0 ... +10                                                                                             | 5                                        | 60 (≤225)                                                           | 1.0                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y22                            | Y8              | 20 (≤55)                                                            | +8.0 ... +10                                                                                             | 5                                        | 60 (≤250)                                                           | 1.0                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y24                            | Y9              | 25 (≤70)                                                            | +8.0 ... +10                                                                                             | 5                                        | 60 (≤250)                                                           | 1.0                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y27                            | Y10             | 25 (≤80)                                                            | +8.0 ... +10                                                                                             | 2                                        | 65 (≤300)                                                           | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y30                            | Y11             | 30 (≤80)                                                            | +8.0 ... +10                                                                                             | 2                                        | 70 (≤300)                                                           | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y33                            | Y12             | 35 (≤80)                                                            | +8.0 ... +10                                                                                             | 2                                        | 75 (≤325)                                                           | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y36                            | Y13             | 35 (≤90)                                                            | +8.0 ... +10                                                                                             | 2                                        | 80 (≤350)                                                           | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y39                            | Y14             | 40 (≤130)                                                           | +10 ... +12                                                                                              | 2                                        | 80 (≤350)                                                           | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y43                            | Y15             | 45 (≤150)                                                           | +10 ... +12                                                                                              | 2                                        | 85 (≤375)                                                           | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y47                            | Y16             | 50 (≤170)                                                           | +10 ... +12                                                                                              | 2                                        | 85 (≤375)                                                           | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y51                            | Y17             | 60 (≤180)                                                           | +10 ... +12                                                                                              | 2                                        | 85 (≤400)                                                           | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y56                            | Y18             | 70 (≤200)                                                           | +9.0 ... +11                                                                                             | 2                                        | 100 (≤425)                                                          | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y62                            | Y19             | 80 (≤215)                                                           | +9.0 ... +12                                                                                             | 2                                        | 100 (≤450)                                                          | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y68                            | Y20             | 90 (≤240)                                                           | +10 ... +12                                                                                              | 2                                        | 150 (≤475)                                                          | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |
| BZX84-y75                            | Y21             | 95 (≤255)                                                           | +10 ... +12                                                                                              | 2                                        | 170 (≤500)                                                          | 0.5                                      | 0.05                       | 0.7 V <sub>Znom.</sub>   |

### Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted) Maximum V<sub>F</sub> = 0.9V at I<sub>F</sub> = 10mA

| Type<br>± 5% Tol. | Zener Voltage<br>range <sup>(1)</sup> at I <sub>ZT1</sub><br>V <sub>Z</sub> (V) |      | Test Current<br>I <sub>ZT1</sub> (mA) |
|-------------------|---------------------------------------------------------------------------------|------|---------------------------------------|
|                   | min.                                                                            | max. |                                       |
| BZX84-C2V4        | 2.20                                                                            | 2.60 | 5                                     |
| BZX84-C2V7        | 2.50                                                                            | 2.90 | 5                                     |
| BZX84-C3          | 2.80                                                                            | 3.20 | 5                                     |
| BZX84-C3V3        | 3.10                                                                            | 3.50 | 5                                     |
| BZX84-C3V6        | 3.40                                                                            | 3.80 | 5                                     |
| BZX84-C3V9        | 3.70                                                                            | 4.10 | 5                                     |
| BZX84-C4V3        | 4.00                                                                            | 4.60 | 5                                     |
| BZX84-C4V7        | 4.40                                                                            | 5.00 | 5                                     |
| BZX84-C5V1        | 4.80                                                                            | 5.40 | 5                                     |
| BZX84-C5V6        | 5.20                                                                            | 6.00 | 5                                     |
| BZX84-C6V2        | 5.80                                                                            | 6.60 | 5                                     |
| BZX84-C6V8        | 6.40                                                                            | 7.20 | 5                                     |
| BZX84-C7V5        | 7.00                                                                            | 7.90 | 5                                     |
| BZX84-C8V2        | 7.70                                                                            | 8.70 | 5                                     |
| BZX84-C9V1        | 8.50                                                                            | 9.60 | 5                                     |
| BZX84-C10         | 9.4                                                                             | 10.6 | 5                                     |
| BZX84-C11         | 10.4                                                                            | 11.6 | 5                                     |
| BZX84-C12         | 11.4                                                                            | 12.7 | 5                                     |
| BZX84-C13         | 12.4                                                                            | 14.1 | 5                                     |
| BZX84-C15         | 13.8                                                                            | 15.6 | 5                                     |
| BZX84-C16         | 15.3                                                                            | 17.1 | 5                                     |
| BZX84-C18         | 16.8                                                                            | 19.1 | 5                                     |
| BZX84-C20         | 18.8                                                                            | 21.2 | 5                                     |
| BZX84-C22         | 20.8                                                                            | 23.3 | 5                                     |
| BZX84-C24         | 22.8                                                                            | 25.6 | 5                                     |
| BZX84-C27         | 25.1                                                                            | 28.9 | 2                                     |
| BZX84-C30         | 28.0                                                                            | 32.0 | 2                                     |
| BZX84-C33         | 31.0                                                                            | 35.0 | 2                                     |
| BZX84-C36         | 34.0                                                                            | 38.0 | 2                                     |
| BZX84-C39         | 37.0                                                                            | 41.0 | 2                                     |
| BZX84-C43         | 40.0                                                                            | 46.0 | 2                                     |
| BZX84-C47         | 44.0                                                                            | 50.0 | 2                                     |
| BZX84-C51         | 48.0                                                                            | 54.0 | 2                                     |
| BZX84-C56         | 52.0                                                                            | 60.0 | 2                                     |
| BZX84-C62         | 58.0                                                                            | 66.0 | 2                                     |
| BZX84-C68         | 64.0                                                                            | 72.0 | 2                                     |
| BZX84-C75         | 70.0                                                                            | 79.0 | 2                                     |

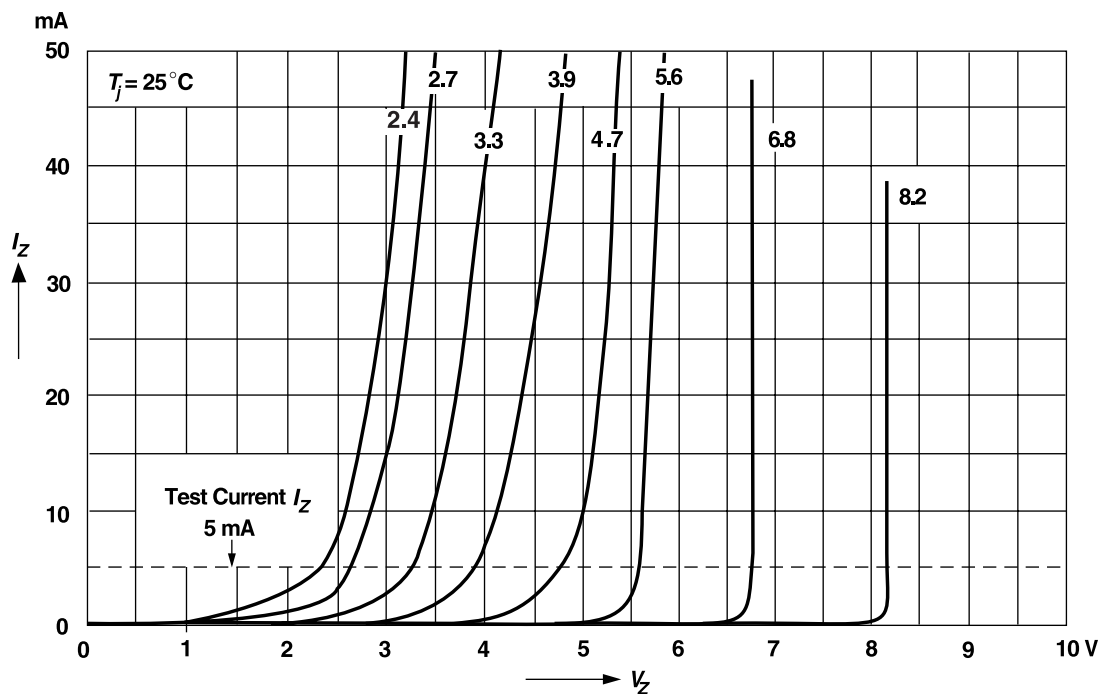
| Type<br>± 2% Tol. | Zener Voltage<br>range <sup>(1)</sup> at I <sub>ZT1</sub><br>V <sub>Z</sub> (V) |      | Test Current<br>I <sub>ZT1</sub> (mA) |
|-------------------|---------------------------------------------------------------------------------|------|---------------------------------------|
|                   | min.                                                                            | max. |                                       |
| BZX84-B2V4        | 2.35                                                                            | 2.45 | 5                                     |
| BZX84-B2V7        | 2.65                                                                            | 2.75 | 5                                     |
| BZX84-B3          | 2.94                                                                            | 3.06 | 5                                     |
| BZX84-B3V3        | 3.23                                                                            | 3.37 | 5                                     |
| BZX84-B3V6        | 3.53                                                                            | 3.67 | 5                                     |
| BZX84-B3V9        | 3.82                                                                            | 3.98 | 5                                     |
| BZX84-B4V3        | 4.21                                                                            | 4.39 | 5                                     |
| BZX84-B4V7        | 4.61                                                                            | 4.79 | 5                                     |
| BZX84-B5V1        | 5.00                                                                            | 5.20 | 5                                     |
| BZX84-B5V6        | 5.49                                                                            | 5.71 | 5                                     |
| BZX84-B6V2        | 6.08                                                                            | 6.32 | 5                                     |
| BZX84-B6V8        | 6.66                                                                            | 6.94 | 5                                     |
| BZX84-B7V5        | 7.35                                                                            | 7.65 | 5                                     |
| BZX84-B8V2        | 8.04                                                                            | 8.36 | 5                                     |
| BZX84-B9V1        | 8.92                                                                            | 9.28 | 5                                     |
| BZX84-B10         | 9.80                                                                            | 10.2 | 5                                     |
| BZX84-B11         | 10.8                                                                            | 11.2 | 5                                     |
| BZX84-B12         | 11.8                                                                            | 12.2 | 5                                     |
| BZX84-B13         | 12.7                                                                            | 13.3 | 5                                     |
| BZX84-B15         | 14.7                                                                            | 15.3 | 5                                     |
| BZX84-B16         | 15.7                                                                            | 16.3 | 5                                     |
| BZX84-B18         | 17.6                                                                            | 18.4 | 5                                     |
| BZX84-B20         | 19.6                                                                            | 20.4 | 5                                     |
| BZX84-B22         | 21.6                                                                            | 22.4 | 5                                     |
| BZX84-B24         | 23.5                                                                            | 24.5 | 5                                     |
| BZX84-B27         | 26.5                                                                            | 27.5 | 2                                     |
| BZX84-B30         | 29.4                                                                            | 30.6 | 2                                     |
| BZX84-B33         | 32.3                                                                            | 33.7 | 2                                     |
| BZX84-B36         | 35.3                                                                            | 36.7 | 2                                     |
| BZX84-B39         | 38.2                                                                            | 39.8 | 2                                     |
| BZX84-B43         | 42.1                                                                            | 43.9 | 2                                     |
| BZX84-B47         | 46.1                                                                            | 47.9 | 2                                     |
| BZX84-B51         | 50.0                                                                            | 52.0 | 2                                     |
| BZX84-B56         | 54.9                                                                            | 46.9 | 2                                     |
| BZX84-B62         | 60.8                                                                            | 63.2 | 2                                     |
| BZX84-B68         | 66.6                                                                            | 69.4 | 2                                     |
| BZX84-B75         | 73.5                                                                            | 76.5 | 2                                     |

**Notes:** (1) Measured with pulses t<sub>p</sub> = 5 ms

### Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

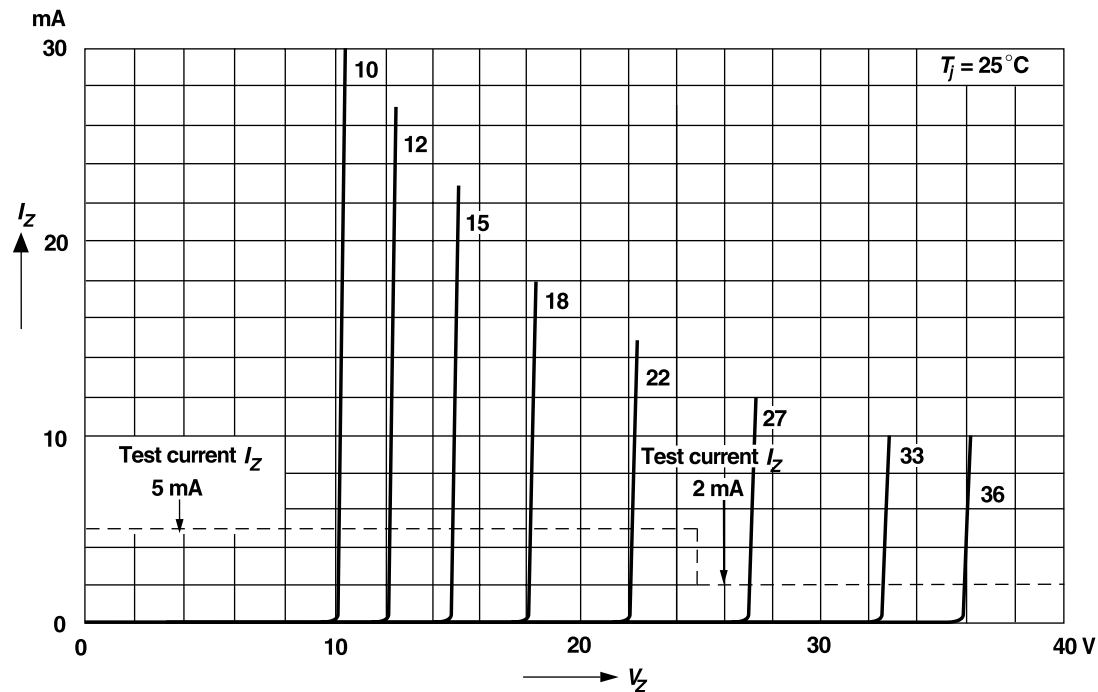
#### Breakdown characteristics

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



#### Breakdown characteristics

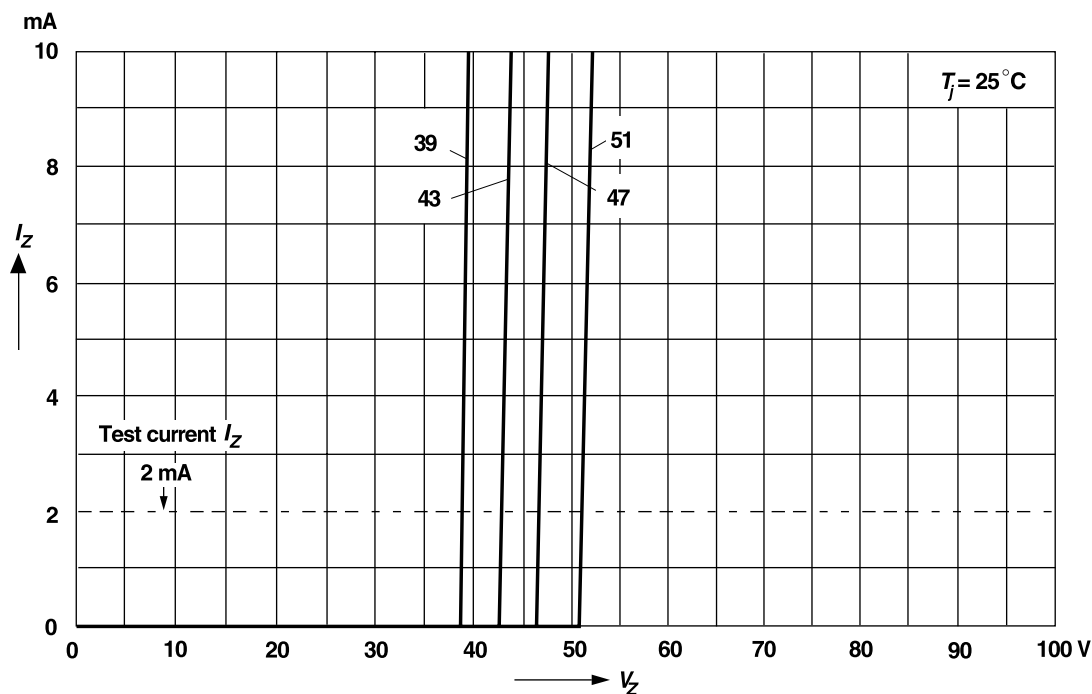
$T_j = \text{constant (pulsed)}$



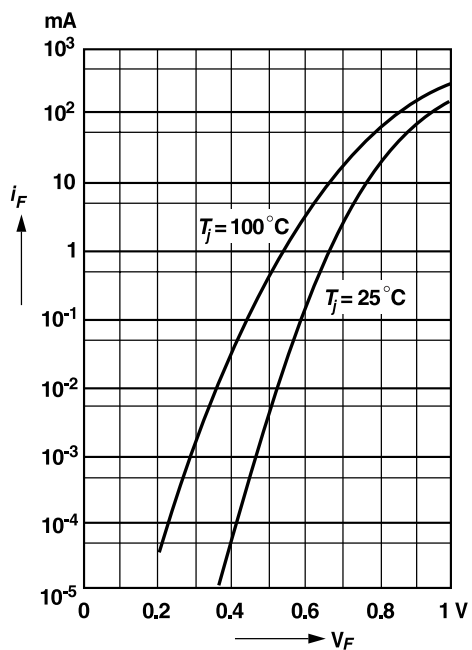
### Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

#### Breakdown characteristics

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

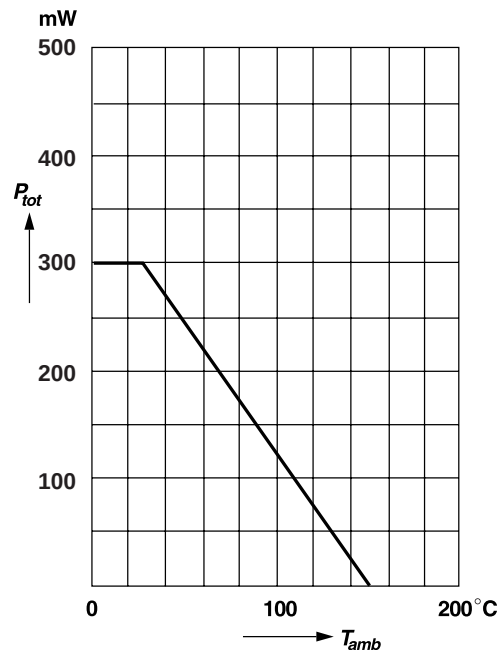


#### Forward characteristics



#### Admissible power dissipation versus ambient temperature

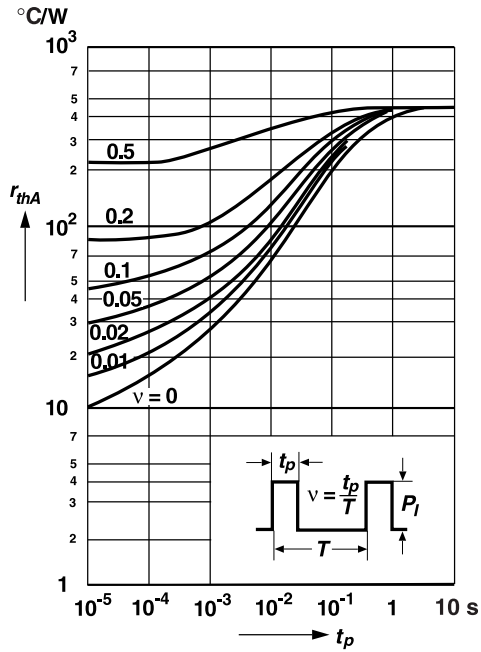
For conditions, see footnote in table  
"Absolute Maximum Ratings"



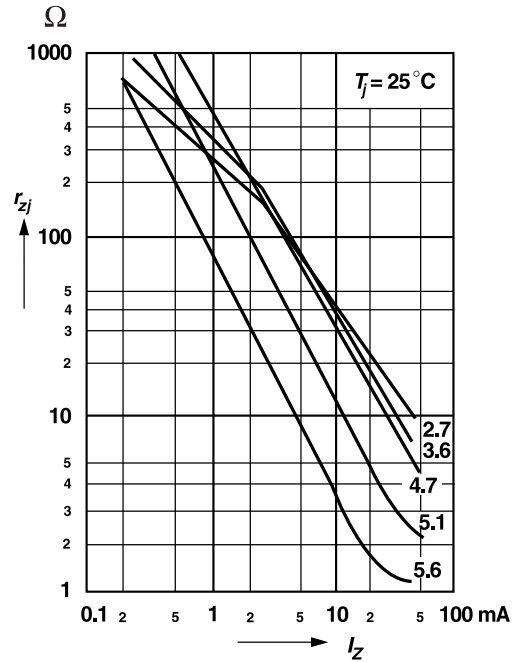
### Ratings and Characteristic Curves (T<sub>A</sub> = 25°C unless otherwise noted)

**Pulse thermal resistance  
versus pulse duration**

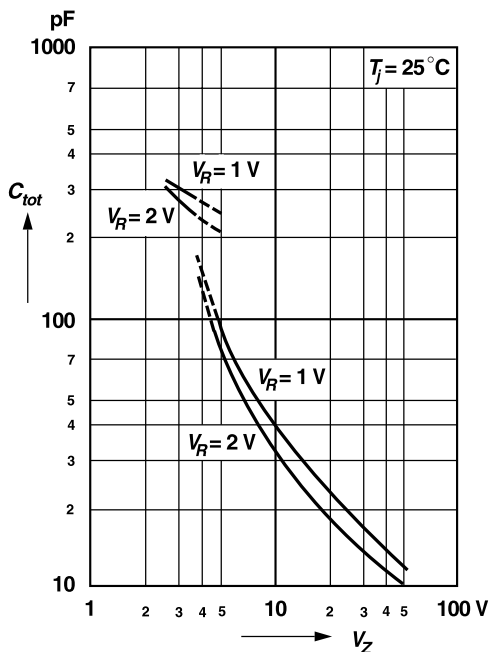
For conditions, see footnote in table  
"Absolute Maximum Ratings"



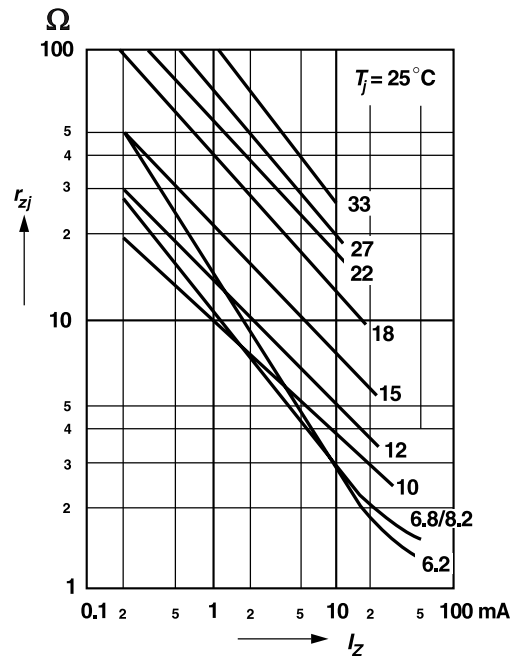
**Dynamic resistance  
versus Zener current**



**Capacitance  
versus Zener voltage**

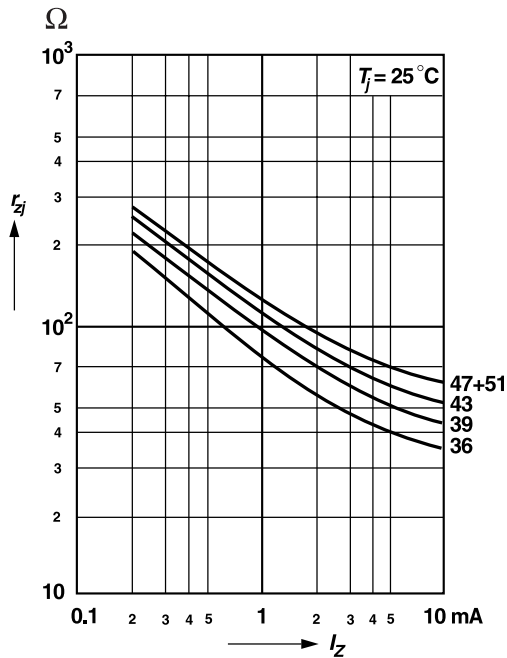


**Dynamic resistance  
versus Zener current**



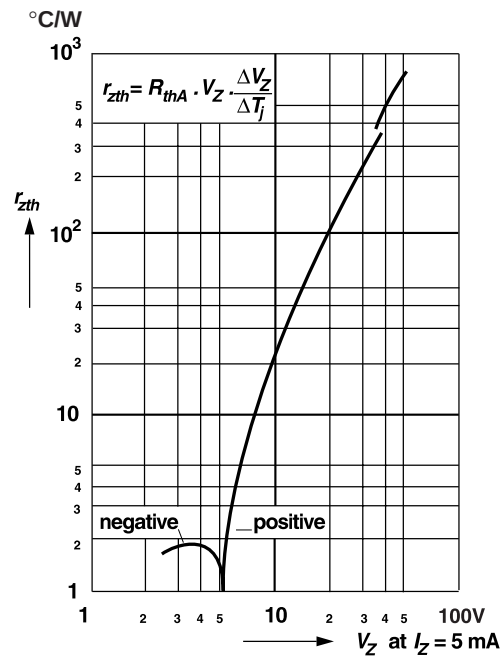
### Ratings and Characteristic Curves (T<sub>A</sub> = 25°C unless otherwise noted)

Dynamic resistance  
versus Zener current

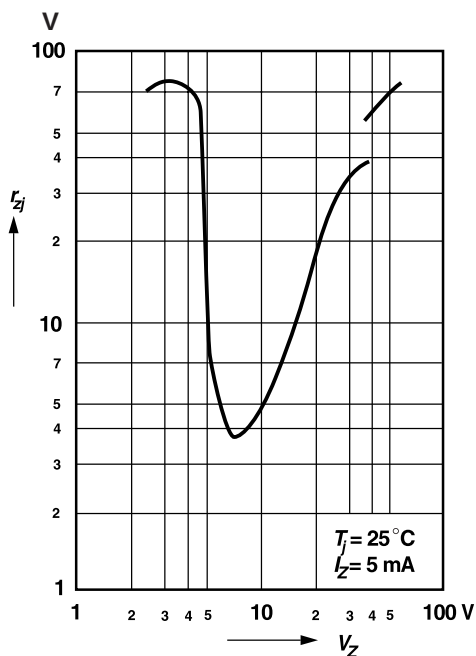


Thermal differential resistance  
versus Zener voltage

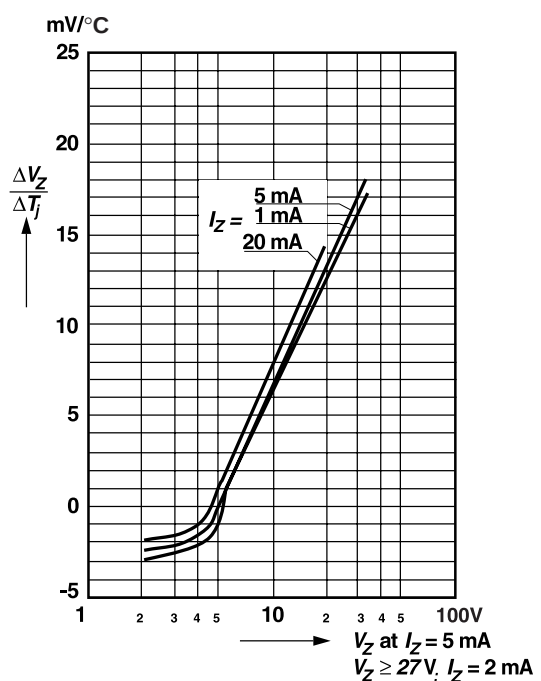
For conditions, see footnote in table  
"Absolute Maximum Ratings"



Dynamic resistance  
versus Zener voltage

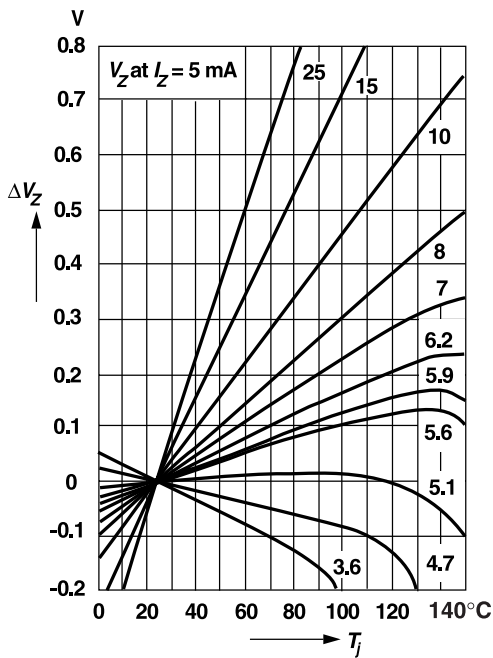


Temperature dependence of Zener voltage  
versus Zener voltage

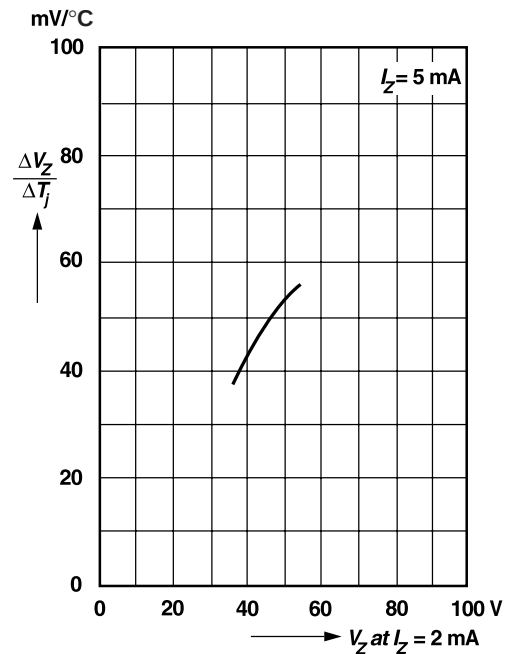


### Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

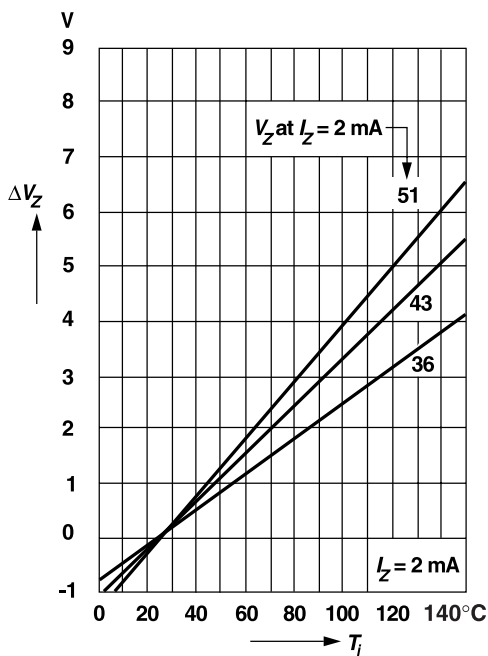
Change of Zener voltage  
versus junction temperature



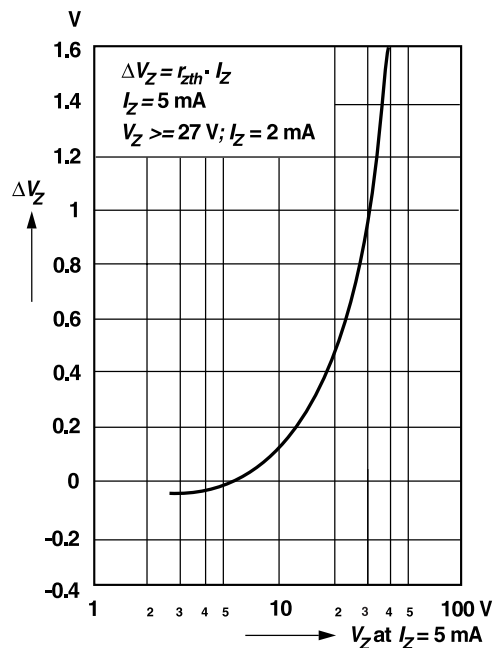
Temperature dependence of Zener  
voltage versus Zener voltage



Change of Zener voltage  
versus junction temperature



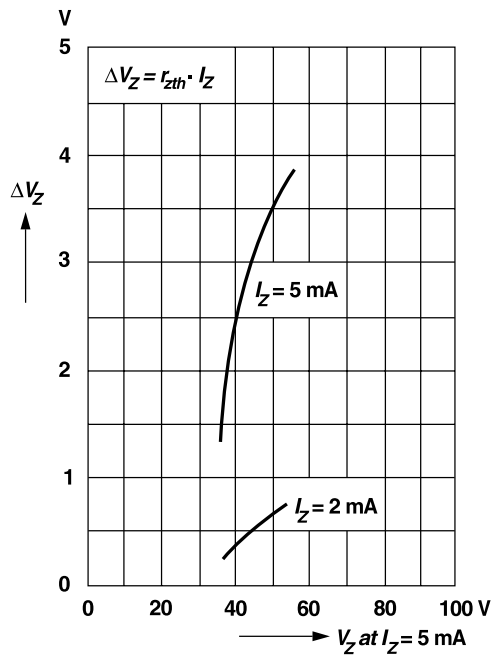
Change of Zener voltage from turn-on  
up to the point of thermal equilibrium  
versus Zener voltage





### Ratings and Characteristic Curves (T<sub>A</sub> = 25°C unless otherwise noted)

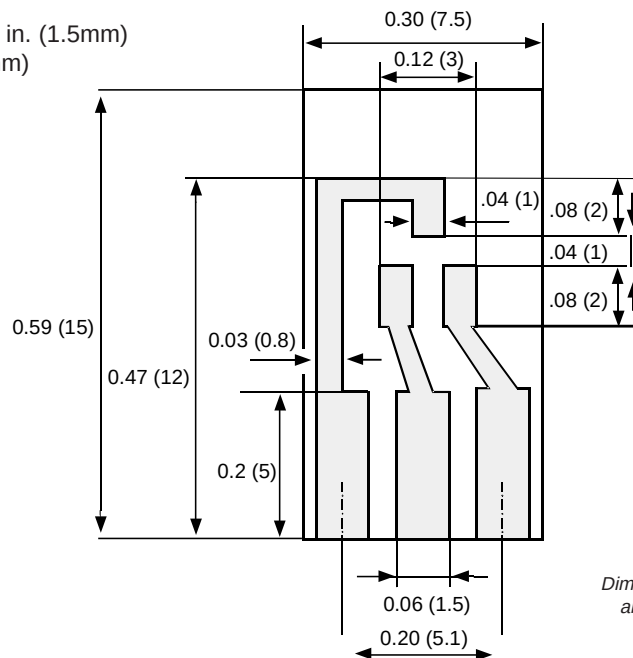
Change of Zener voltage from turn-on  
up to the point of thermal equilibrium  
versus Zener voltage



#### Layout for R<sub>ΘJA</sub> test

Thickness: Fiberglass 0.059 in. (1.5mm)

Copper leads 0.012 in. (0.3mm)



Dimensions in inches  
and (millimeters)