

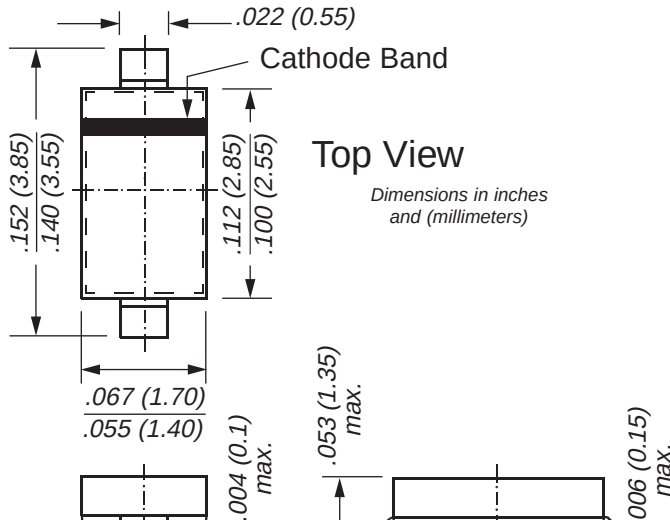


## Zener Diodes

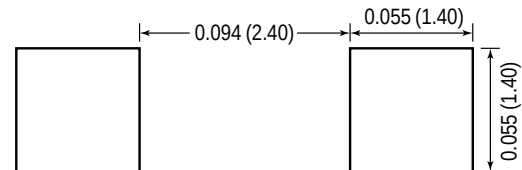
VZ Range 2.4 to 75

Power Dissipation 410mW

### SOD-123



### 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 suffix "C" with "B" for  $\pm 2\%$  tolerance. Other tolerances and other Zener voltages are available upon request.
- These diodes are also available in other case styles and other configurations including: the SOT-23 case with type designation BZX84 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:** SOD-123 Plastic Case

**Weight:** approx. 0.01g

**Packaging Codes/Options:**

D3 / 10K per 13" reel (8mm tape)

D4 / 3K per 7" reel (8mm tape)

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

| Parameter                                     | Symbol           | Value              | Unit |
|-----------------------------------------------|------------------|--------------------|------|
| Zener Current (see Table "Characteristics")   |                  |                    |      |
| Power Dissipation at Tamb = 25°C              | P <sub>tot</sub> | 410 <sup>(1)</sup> | mW   |
| Thermal Resistance<br>Junction to Ambient Air | R <sub>θJA</sub> | 300 <sup>(2)</sup> | °C/W |
| Junction Temperature                          | T <sub>j</sub>   | 150                | °C   |
| Storage Temperature Range                     | T <sub>S</sub>   | -65 to +150        | °C   |

**Notes:**

(1) Diode on Ceramic Substrate 0.7mm; 2.5mm<sup>2</sup> area

(2) Valid provided that electrodes are kept at ambient temperature

### Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

| y = C for ± 5%<br>y = B for ± 2%<br>Type | Marking<br>Code | Dynamic Resistance                                          |                                                            | Temp. Coeff.<br>of Zener Voltage<br>at I <sub>Z</sub> = 5mA<br>α <sub>VZ</sub> (10 <sup>-4</sup> /°C) | Reverse<br>Voltage<br>at I <sub>R</sub> = 100nA<br>V <sub>R</sub> (V) | Admissible Zener current <sup>(4)</sup>              |                                                      |
|------------------------------------------|-----------------|-------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|
|                                          |                 | at I <sub>Z</sub> = 5mA<br>f = 1 kHz<br>r <sub>Zj</sub> (Ω) | at I <sub>Z</sub> = 1mA<br>f = 1kHz<br>r <sub>Zj</sub> (Ω) |                                                                                                       |                                                                       | at<br>T <sub>amb</sub> = 45°C<br>I <sub>Z</sub> (mA) | at<br>T <sub>amb</sub> = 25°C<br>I <sub>Z</sub> (mA) |
| BZT52-y2V4                               | W1              | 85                                                          | 600                                                        | - 9 ... - 4                                                                                           | -                                                                     | -                                                    | -                                                    |
| BZT52-y2V7                               | W2              | 75 (< 83)                                                   | < 500                                                      | - 9 ... - 4                                                                                           | -                                                                     | 113                                                  | 134                                                  |
| BZT52-y3                                 | W3              | 80 (< 95)                                                   | < 500                                                      | - 9 ... - 3                                                                                           | -                                                                     | 98                                                   | 118                                                  |
| BZT52-y3V3                               | W4              | 80 (< 95)                                                   | < 500                                                      | - 8 ... - 3                                                                                           | -                                                                     | 92                                                   | 109W5                                                |
| BZT52-y3V6                               | W5              | 80 (< 95)                                                   | < 500                                                      | - 8 ... - 3                                                                                           | -                                                                     | 85                                                   | 100                                                  |
| BZT52-y3V9                               | W6              | 80 (< 95)                                                   | < 500                                                      | - 7 ... - 3                                                                                           | -                                                                     | 77                                                   | 92                                                   |
| BZT52-y4V3                               | W7              | 80 (< 95)                                                   | < 500                                                      | - 6 ... - 1                                                                                           | -                                                                     | 71                                                   | 84                                                   |
| BZT52-y4V7                               | W8              | 70 (< 78)                                                   | < 500                                                      | - 5 ... +2                                                                                            | -                                                                     | 64                                                   | 76                                                   |
| BZT52-y5V1                               | W9              | 30 (< 60)                                                   | < 480                                                      | - 3 ... +4                                                                                            | > 0.8                                                                 | 56                                                   | 67                                                   |
| BZT52-y5V6                               | WA              | 10 (< 40)                                                   | < 400                                                      | - 2 ... +6                                                                                            | > 1                                                                   | 50                                                   | 59                                                   |
| BZT52-y6V2                               | WB              | 4.8 (< 10)                                                  | < 200                                                      | - 1 ... +7                                                                                            | > 2                                                                   | 45                                                   | 54                                                   |
| BZT52-y6V8                               | WC              | 4.5 (< 8)                                                   | < 150                                                      | +2 ... +7                                                                                             | > 3                                                                   | 41                                                   | 49                                                   |
| BZT52-y7V5                               | WD              | 4 (< 7)                                                     | < 50                                                       | +3 ... +7                                                                                             | > 5                                                                   | 37                                                   | 44                                                   |
| BZT52-y8V2                               | WE              | 4.5 (< 7)                                                   | < 50                                                       | +4 ... +7                                                                                             | > 6                                                                   | 34                                                   | 40                                                   |
| BZT52-y9V1                               | WF              | 4.8 (< 10)                                                  | < 50                                                       | +5 ... +8                                                                                             | > 7                                                                   | 30                                                   | 36                                                   |
| BZT52-y10                                | WG              | 5.2 (< 15)                                                  | < 70                                                       | +5 ... +8                                                                                             | > 7.5                                                                 | 28                                                   | 33                                                   |
| BZT52-y11                                | WH              | 6 (< 20)                                                    | < 70                                                       | +5 ... +9                                                                                             | > 8.5                                                                 | 25                                                   | 30                                                   |
| BZT52-y12                                | WI              | 7 (< 20)                                                    | < 90                                                       | +6 ... +9                                                                                             | > 9                                                                   | 23                                                   | 28                                                   |
| BZT52-y13                                | WK              | 9 (< 25)                                                    | < 110                                                      | +7 ... +9                                                                                             | > 10                                                                  | 21                                                   | 25                                                   |
| BZT52-y15                                | WL              | 11 (< 30)                                                   | < 110                                                      | +7 ... +9                                                                                             | > 11                                                                  | 19                                                   | 23                                                   |
| BZT52-y16                                | WM              | 13 (< 40)                                                   | < 170                                                      | +8 ... +9.5                                                                                           | > 12                                                                  | 17                                                   | 20                                                   |
| BZT52-y18                                | WN              | 18 (< 50)                                                   | < 170                                                      | +8 ... +9.5                                                                                           | > 14                                                                  | 15                                                   | 18                                                   |
| BZT52-y20                                | WO              | 20 (< 50)                                                   | < 220                                                      | +8 ... +10                                                                                            | > 15                                                                  | 14                                                   | 17                                                   |
| BZT52-y22                                | WP              | 25 (< 55)                                                   | < 220                                                      | +8 ... +10                                                                                            | > 17                                                                  | 13                                                   | 16                                                   |
| BZT52-y24                                | WR              | 28 (< 80)                                                   | < 220                                                      | +8 ... +10                                                                                            | > 18                                                                  | 11                                                   | 13                                                   |
| BZT52-y27                                | WS              | 30 (< 80)                                                   | < 250                                                      | +8 ... +10                                                                                            | > 20                                                                  | 10                                                   | 12                                                   |
| BZT52-y30                                | WT              | 35 (< 80)                                                   | < 250                                                      | +8 ... +10                                                                                            | > 22.5                                                                | 9                                                    | 10                                                   |
| BZT52-y33                                | WU              | 40 (< 80)                                                   | < 250                                                      | +8 ... +10                                                                                            | > 25                                                                  | 8                                                    | 9                                                    |
| BZT52-y36                                | WW              | 40 (< 90)                                                   | < 250                                                      | +8 ... +10                                                                                            | > 27                                                                  | 8                                                    | 9                                                    |
| BZT52-y39                                | WX              | 50 (< 90)                                                   | < 300                                                      | +10 ... +12                                                                                           | > 29                                                                  | 7                                                    | 8                                                    |
| BZT52-y43                                | WY              | 60 (< 100)                                                  | < 700                                                      | +10 ... +12                                                                                           | > 32                                                                  | 6                                                    | 7                                                    |
| BZT52-y47                                | WZ              | 70 (< 100)                                                  | < 750                                                      | +10 ... +12                                                                                           | > 35                                                                  | 5                                                    | 6                                                    |
| BZT52-y51                                | X1              | 70 (< 100)                                                  | < 750                                                      | +10 ... +12                                                                                           | > 38                                                                  | 5                                                    | 6                                                    |
| BZT52-y56                                | X2              | < 135 <sup>(2)</sup>                                        | < 1000 <sup>(3)</sup>                                      | typ. +10 <sup>(2)</sup>                                                                               | -                                                                     | -                                                    | -                                                    |
| BZT52-y62                                | X3              | < 150 <sup>(2)</sup>                                        | < 1000 <sup>(3)</sup>                                      | typ. +10 <sup>(2)</sup>                                                                               | -                                                                     | -                                                    | -                                                    |
| BZT52-y68                                | X4              | < 200 <sup>(2)</sup>                                        | < 1000 <sup>(3)</sup>                                      | typ. +10 <sup>(2)</sup>                                                                               | -                                                                     | -                                                    | -                                                    |
| BZT52-y75                                | X5              | < 250 <sup>(2)</sup>                                        | < 1500 <sup>(3)</sup>                                      | typ. +10 <sup>(2)</sup>                                                                               | -                                                                     | -                                                    | -                                                    |

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

(2) at I<sub>Z</sub> = 2.5 mA

(3) at I<sub>Z</sub> = 0.5 mA

(4) Valid provided that electrodes are kept at ambient temperature

### Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

| 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. |                                       |
| BZT52-C2V4        | 2.20                                                                            | 2.60 | 5                                     |
| BZT52-C2V7        | 2.50                                                                            | 2.90 | 5                                     |
| BZT52-C3          | 2.80                                                                            | 3.20 | 5                                     |
| BZT52-C3V3        | 3.10                                                                            | 3.50 | 5                                     |
| BZT52-C3V6        | 3.40                                                                            | 3.80 | 5                                     |
| BZT52-C3V9        | 3.70                                                                            | 4.10 | 5                                     |
| BZT52-C4V3        | 4.00                                                                            | 4.60 | 5                                     |
| BZT52-C4V7        | 4.40                                                                            | 5.00 | 5                                     |
| BZT52-C5V1        | 4.80                                                                            | 5.40 | 5                                     |
| BZT52-C5V6        | 5.20                                                                            | 6.00 | 5                                     |
| BZT52-C6V2        | 5.80                                                                            | 6.60 | 5                                     |
| BZT52-C6V8        | 6.40                                                                            | 7.20 | 5                                     |
| BZT52-C7V5        | 7.00                                                                            | 7.90 | 5                                     |
| BZT52-C8V2        | 7.70                                                                            | 8.70 | 5                                     |
| BZT52-C9V1        | 8.50                                                                            | 9.60 | 5                                     |
| BZT52-C10         | 9.4                                                                             | 10.6 | 5                                     |
| BZT52-C11         | 10.4                                                                            | 11.6 | 5                                     |
| BZT52-C12         | 11.4                                                                            | 12.7 | 5                                     |
| BZT52-C13         | 12.4                                                                            | 14.1 | 5                                     |
| BZT52-C15         | 13.8                                                                            | 15.6 | 5                                     |
| BZT52-C16         | 15.3                                                                            | 17.1 | 5                                     |
| BZT52-C18         | 16.8                                                                            | 19.1 | 5                                     |
| BZT52-C20         | 18.8                                                                            | 21.2 | 5                                     |
| BZT52-C22         | 20.8                                                                            | 23.3 | 5                                     |
| BZT52-C24         | 22.8                                                                            | 25.6 | 5                                     |
| BZT52-C27         | 25.1                                                                            | 28.9 | 5                                     |
| BZT52-C30         | 28.0                                                                            | 32.0 | 5                                     |
| BZT52-C33         | 31.0                                                                            | 35.0 | 5                                     |
| BZT52-C36         | 34.0                                                                            | 38.0 | 5                                     |
| BZT52-C39         | 37.0                                                                            | 41.0 | 5                                     |
| BZT52-C43         | 40.0                                                                            | 46.0 | 5                                     |
| BZT52-C47         | 44.0                                                                            | 50.0 | 5                                     |
| BZT52-C51         | 48.0                                                                            | 54.0 | 5                                     |
| BZT52-C56         | 52.0                                                                            | 60.0 | 2.5                                   |
| BZT52-C62         | 58.0                                                                            | 66.0 | 2.5                                   |
| BZT52-C68         | 64.0                                                                            | 72.0 | 2.5                                   |
| BZT52-C75         | 70.0                                                                            | 79.0 | 2.5                                   |

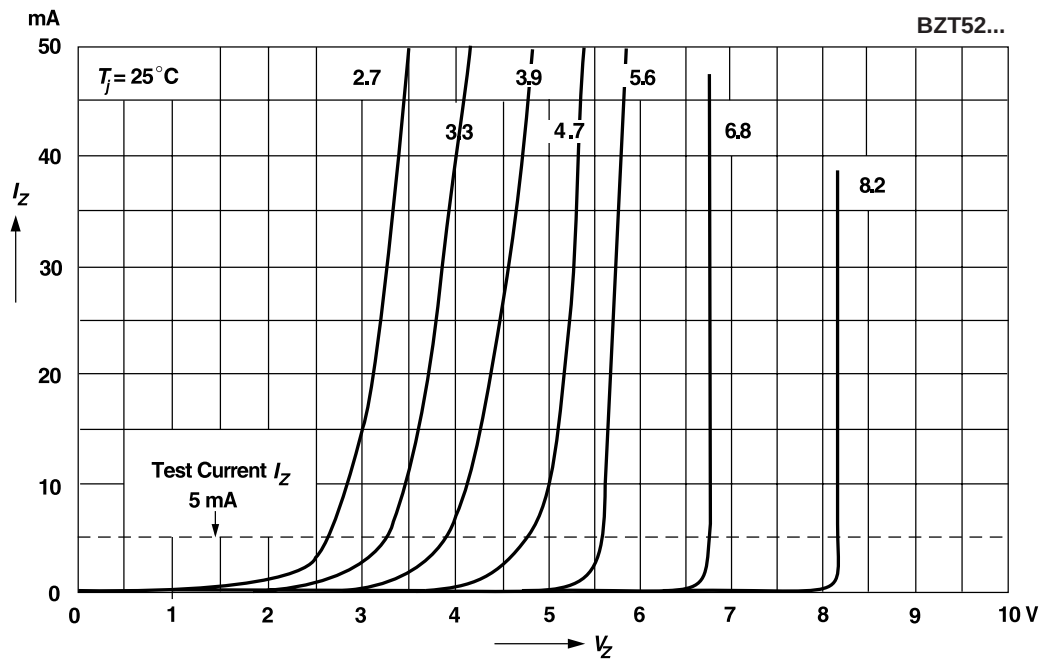
| Type<br>± 2% Tol. | Zener Voltage<br>range <sup>(1)</sup> at I <sub>ZT1</sub><br>V <sub>Z</sub> (V) |      | Test Current<br>I <sub>ZT1</sub> (mA) |
|-------------------|---------------------------------------------------------------------------------|------|---------------------------------------|
|                   | min.                                                                            | max. |                                       |
| BZT52-B2V4        | 2.35                                                                            | 2.45 | 5                                     |
| BZT52-B2V7        | 2.65                                                                            | 2.75 | 5                                     |
| BZT52-B3          | 2.94                                                                            | 3.06 | 5                                     |
| BZT52-B3V3        | 3.23                                                                            | 3.37 | 5                                     |
| BZT52-B3V6        | 3.53                                                                            | 3.67 | 5                                     |
| BZT52-B3V9        | 3.82                                                                            | 3.98 | 5                                     |
| BZT52-B4V3        | 4.21                                                                            | 4.39 | 5                                     |
| BZT52-B4V7        | 4.61                                                                            | 4.79 | 5                                     |
| BZT52-B5V1        | 5.00                                                                            | 5.20 | 5                                     |
| BZT52-B5V6        | 5.49                                                                            | 5.71 | 5                                     |
| BZT52-B6V2        | 6.08                                                                            | 6.32 | 5                                     |
| BZT52-B6V8        | 6.66                                                                            | 6.94 | 5                                     |
| BZT52-B7V5        | 7.35                                                                            | 7.65 | 5                                     |
| BZT52-B8V2        | 8.04                                                                            | 8.36 | 5                                     |
| BZT52-B9V1        | 8.92                                                                            | 9.28 | 5                                     |
| BZT52-B10         | 9.80                                                                            | 10.2 | 5                                     |
| BZT52-B11         | 10.8                                                                            | 11.2 | 5                                     |
| BZT52-B12         | 11.8                                                                            | 12.2 | 5                                     |
| BZT52-B13         | 12.7                                                                            | 13.3 | 5                                     |
| BZT52-B15         | 14.7                                                                            | 15.3 | 5                                     |
| BZT52-B16         | 15.7                                                                            | 16.3 | 5                                     |
| BZT52-B18         | 17.6                                                                            | 18.4 | 5                                     |
| BZT52-B20         | 19.6                                                                            | 20.4 | 5                                     |
| BZT52-B22         | 21.6                                                                            | 22.4 | 5                                     |
| BZT52-B24         | 23.5                                                                            | 24.5 | 5                                     |
| BZT52-B27         | 26.5                                                                            | 27.5 | 5                                     |
| BZT52-B30         | 29.4                                                                            | 30.6 | 5                                     |
| BZT52-B33         | 32.3                                                                            | 33.7 | 5                                     |
| BZT52-B36         | 35.3                                                                            | 36.7 | 5                                     |
| BZT52-B39         | 38.2                                                                            | 39.8 | 5                                     |
| BZT52-B43         | 42.1                                                                            | 43.9 | 5                                     |
| BZT52-B47         | 46.1                                                                            | 47.9 | 5                                     |
| BZT52-B51         | 50.0                                                                            | 52.0 | 5                                     |
| BZT52-B56         | 54.9                                                                            | 57.1 | 2.5                                   |
| BZT52-B62         | 60.8                                                                            | 63.2 | 2.5                                   |
| BZT52-B68         | 66.6                                                                            | 69.4 | 2.5                                   |
| BZT52-B75         | 73.5                                                                            | 76.5 | 2.5                                   |

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

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

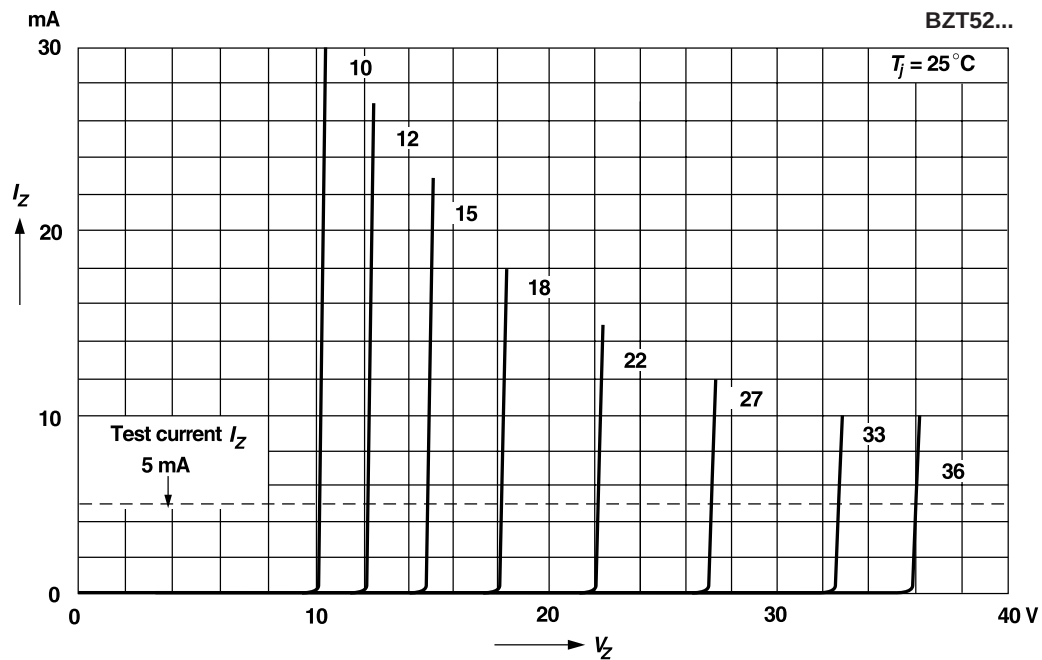
#### Breakdown characteristics

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



#### Breakdown characteristics

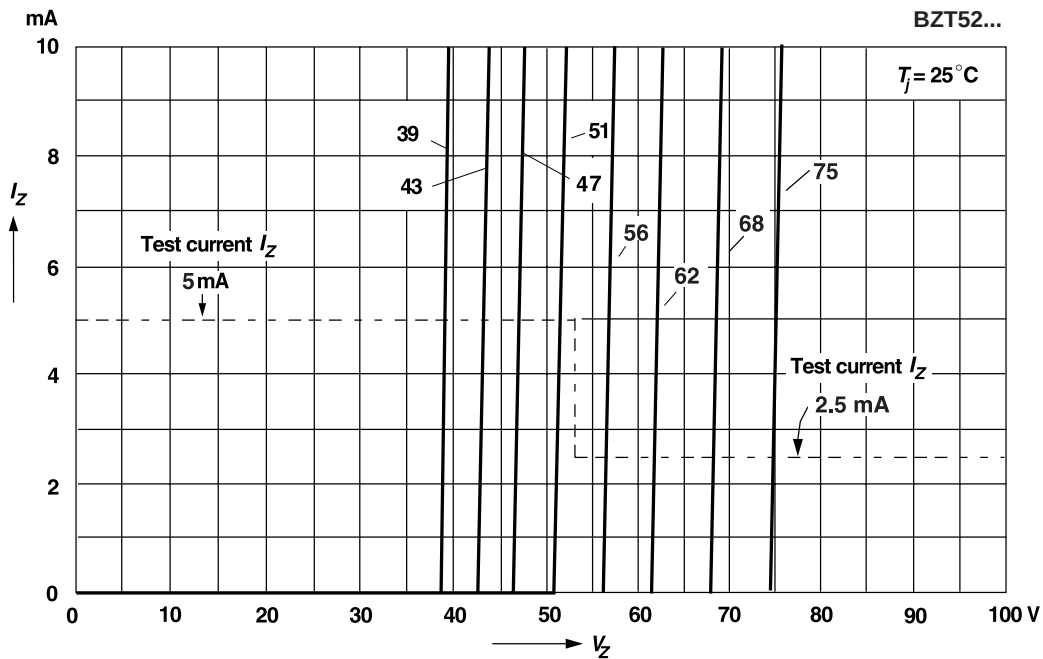
$T_J = \text{constant (pulsed)}$



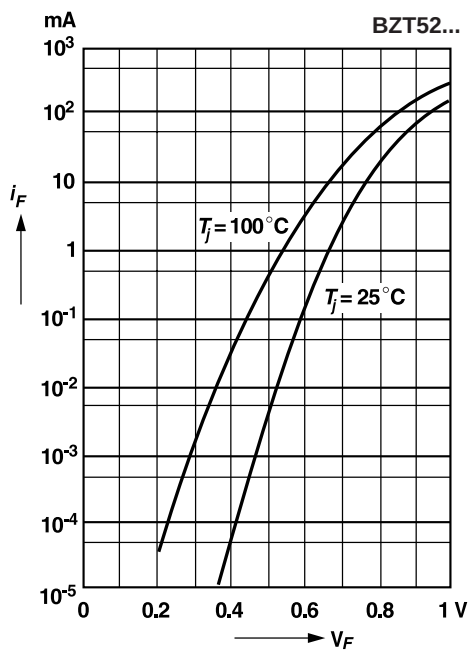
### Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

#### Breakdown characteristics

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



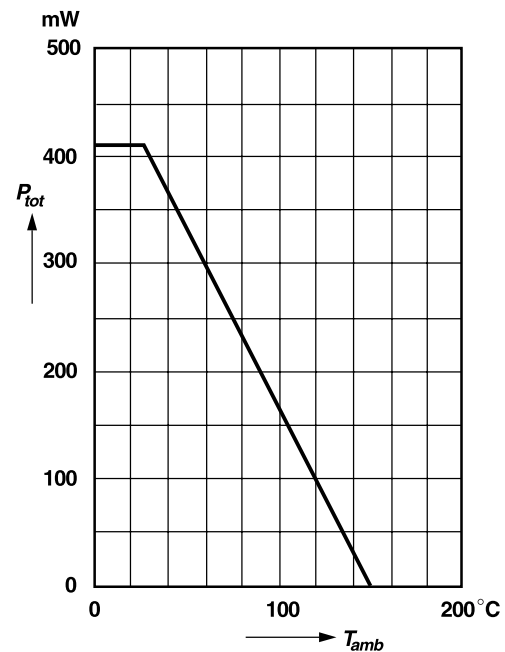
#### Forward characteristics



#### Admissible power dissipation versus ambient temperature

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

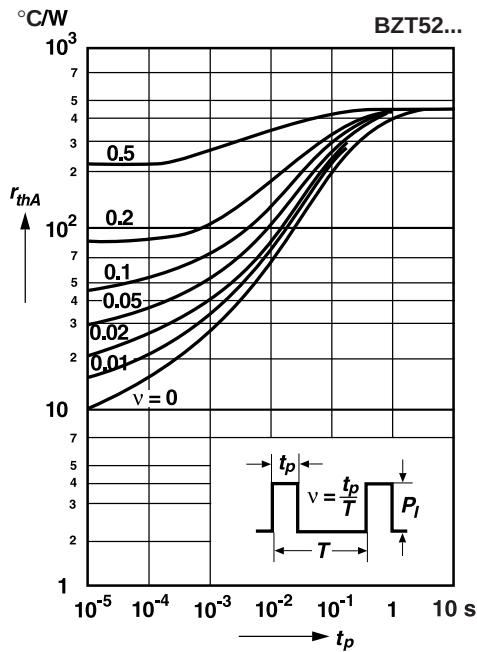
BZT52...



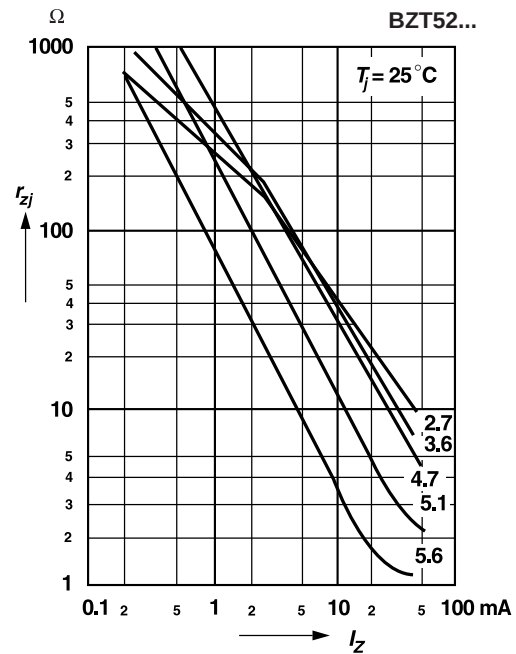
### Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

**Pulse thermal resistance  
versus pulse duration**

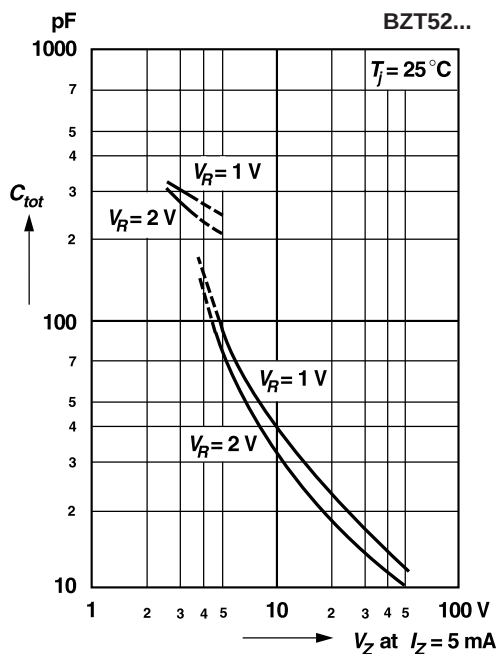
For conditions, see footnote in table  
"Absolute Maximum Ratings"



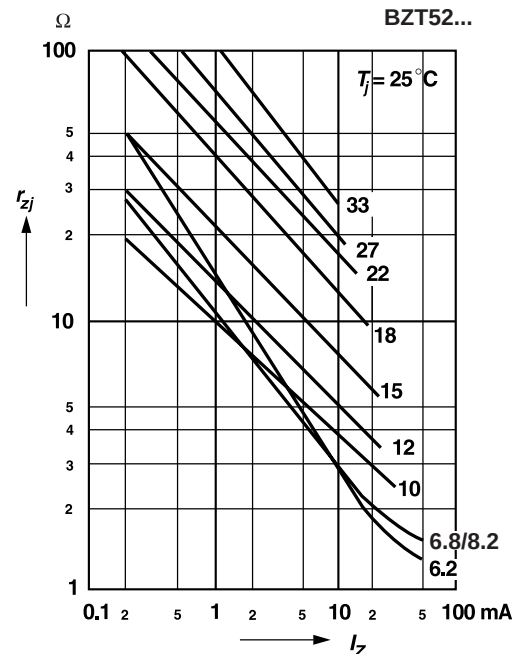
**Dynamic resistance  
versus Zener current**



**Capacitance  
versus Zener voltage**

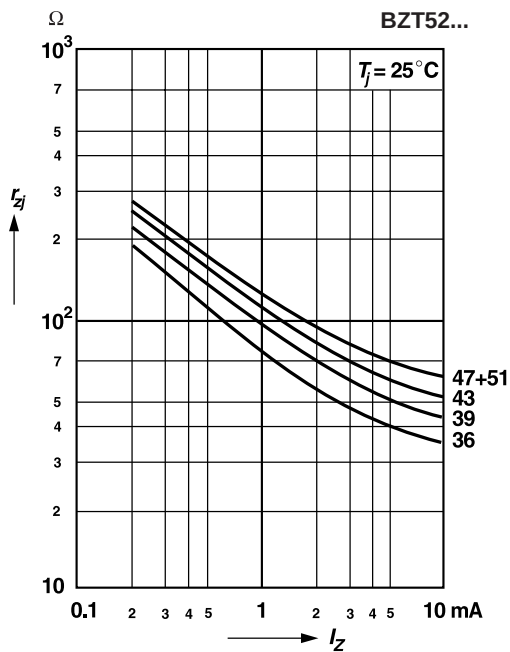


**Dynamic resistance  
versus Zener current**



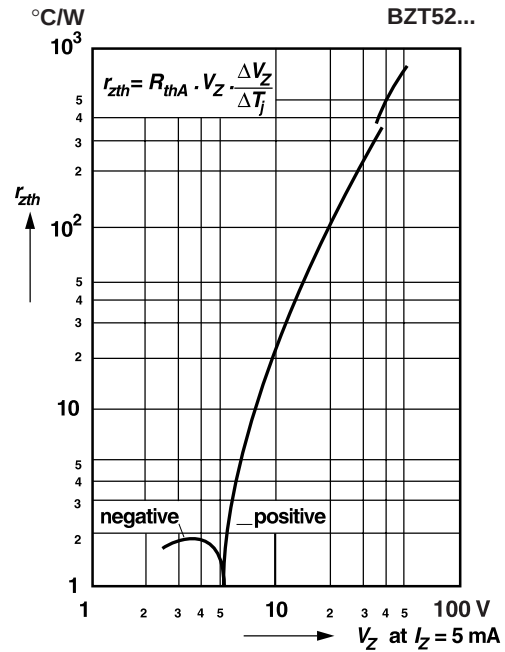
### Ratings and Characteristic Curves (T<sub>A</sub> = 25°C unless otherwise noted)

Dynamic resistance  
versus Zener current

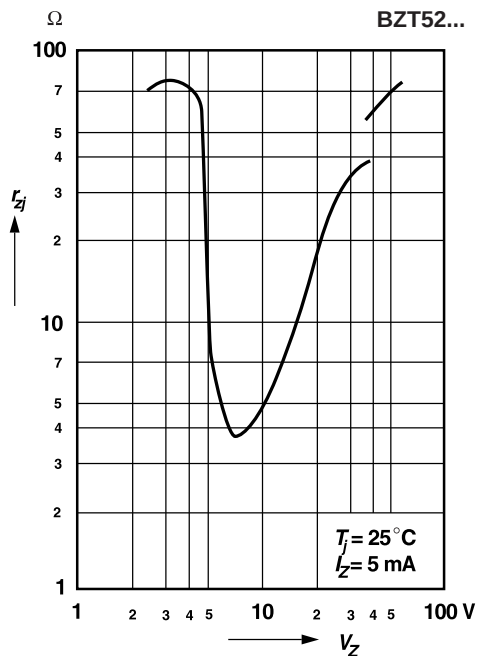


Thermal differential resistance  
versus Zener voltage

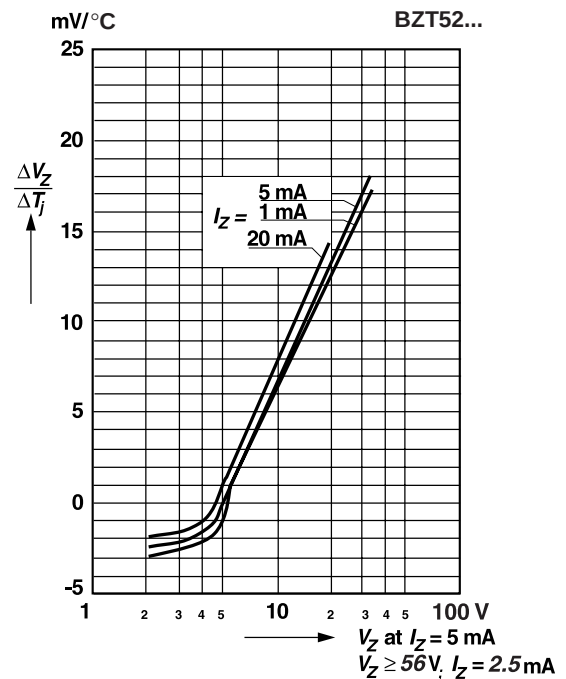
For conditions, see footnote in table  
"Absolute Maximum Ratings"



Dynamic resistance  
versus Zener voltage

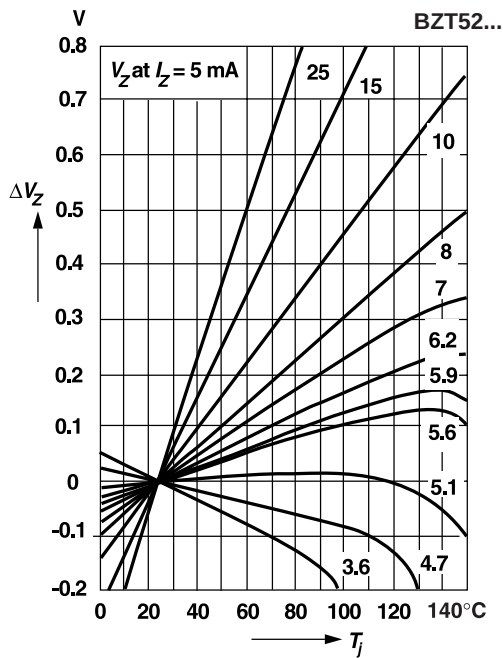


Temperature dependence of Zener voltage  
versus Zener voltage

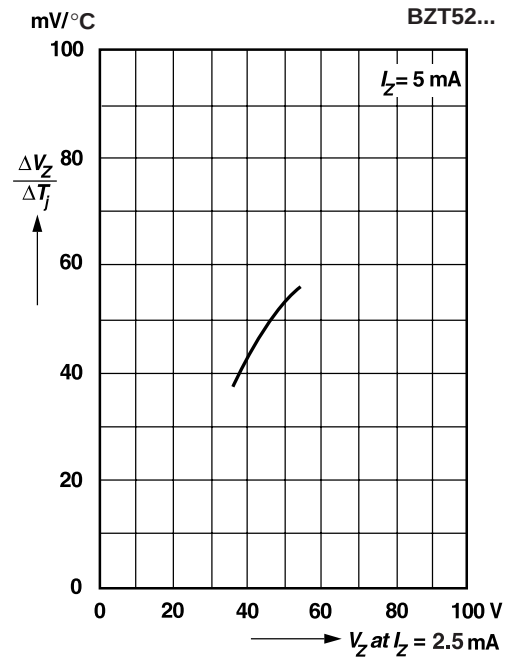


### Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

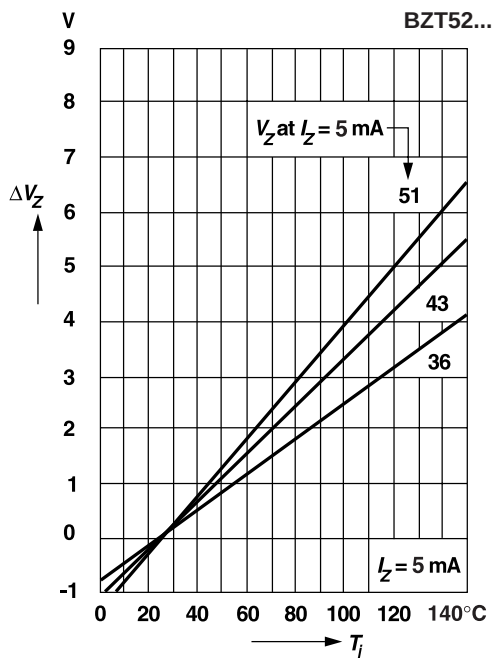
Change of Zener voltage  
versus junction temperature



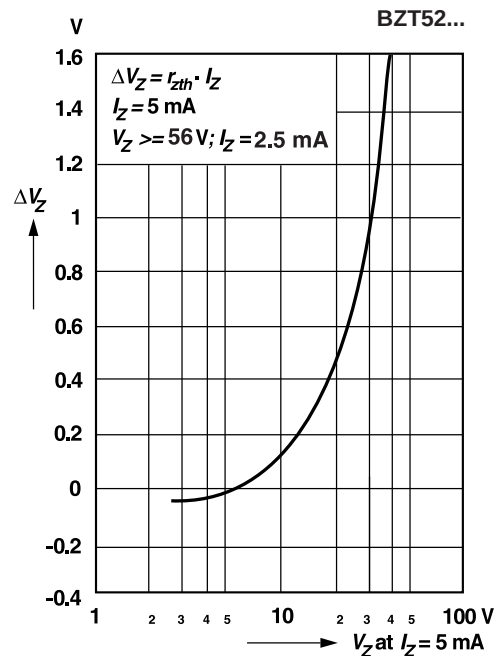
Temperature dependence of Zener  
voltage versus Zener voltage



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

