

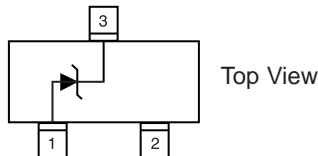
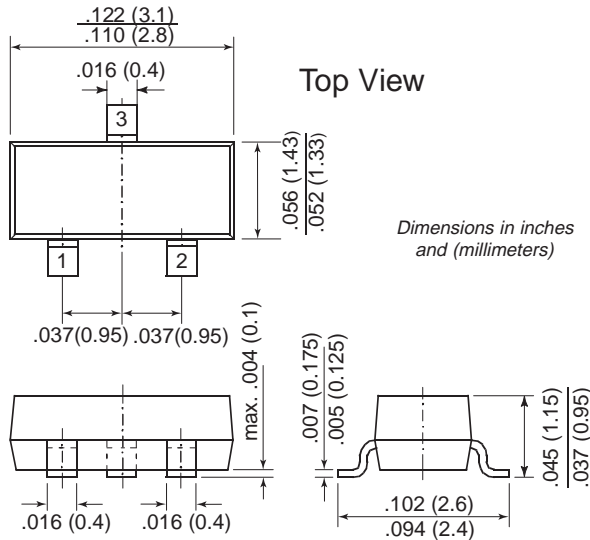


Zener Diodes

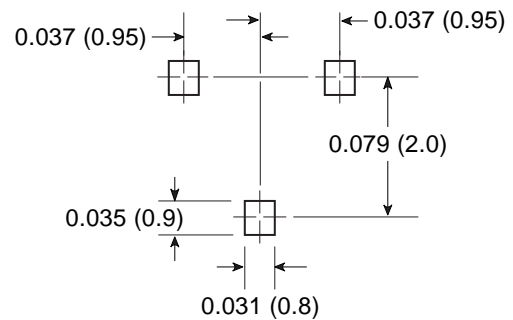
V_z Range 2.4 to 75V

Power Dissipation 300mW

TO-236AB (SOT-23)



Mounting Pad Layout



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

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.

Maximum Ratings and Thermal Characteristics (T_A = 25°C unless otherwise noted)

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

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

Electrical Characteristics (T_A = 25°C unless otherwise noted) Maximum V_F = 0.9V at I_F = 10mA

| Type y = C for 5% y = B for 2% | Marking Code | Dynamic Resistance at I _{ZT1} r _{zj} (Ω) | Temp. Coeffi- cient of Zener Voltage at I _{ZT1} α _{VZ} (10 ⁻⁴ /°C) | Test Current I _{ZT1} (mA) | Dynamic Resistance at I _{ZT2} r _{zj} (Ω) | Test Current I _{ZT2} (mA) | Reverse Leakage Current | |
|--------------------------------------|-----------------|---|--|--|---|--|----------------------------|--------------------------|
| | | | | | | | I _R (μA) | at V _R (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 _{Znom.} |
| BZX84-y16 | Y5 | 10 (≤40) | +8.0 ... +9.5 | 5 | 50 (≤200) | 1.0 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y18 | Y6 | 10 (≤45) | +8.0 ... +9.5 | 5 | 50 (≤225) | 1.0 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y20 | Y7 | 15 (≤55) | +8.0 ... +10 | 5 | 60 (≤225) | 1.0 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y22 | Y8 | 20 (≤55) | +8.0 ... +10 | 5 | 60 (≤250) | 1.0 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y24 | Y9 | 25 (≤70) | +8.0 ... +10 | 5 | 60 (≤250) | 1.0 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y27 | Y10 | 25 (≤80) | +8.0 ... +10 | 2 | 65 (≤300) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y30 | Y11 | 30 (≤80) | +8.0 ... +10 | 2 | 70 (≤300) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y33 | Y12 | 35 (≤80) | +8.0 ... +10 | 2 | 75 (≤325) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y36 | Y13 | 35 (≤90) | +8.0 ... +10 | 2 | 80 (≤350) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y39 | Y14 | 40 (≤130) | +10 ... +12 | 2 | 80 (≤350) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y43 | Y15 | 45 (≤150) | +10 ... +12 | 2 | 85 (≤375) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y47 | Y16 | 50 (≤170) | +10 ... +12 | 2 | 85 (≤375) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y51 | Y17 | 60 (≤180) | +10 ... +12 | 2 | 85 (≤400) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y56 | Y18 | 70 (≤200) | +9.0 ... +11 | 2 | 100 (≤425) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y62 | Y19 | 80 (≤215) | +9.0 ... +12 | 2 | 100 (≤450) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y68 | Y20 | 90 (≤240) | +10 ... +12 | 2 | 150 (≤475) | 0.5 | 0.05 | 0.7 V _{Znom.} |
| BZX84-y75 | Y21 | 95 (≤255) | +10 ... +12 | 2 | 170 (≤500) | 0.5 | 0.05 | 0.7 V _{Znom.} |

Electrical Characteristics (T_A = 25°C unless otherwise noted) Maximum V_F = 0.9V at I_F = 10mA

| Type ± 5% Tol. | Zener Voltage range ⁽¹⁾ at I _{ZT1} V _Z (V) | | Test Current I _{ZT1} (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 |

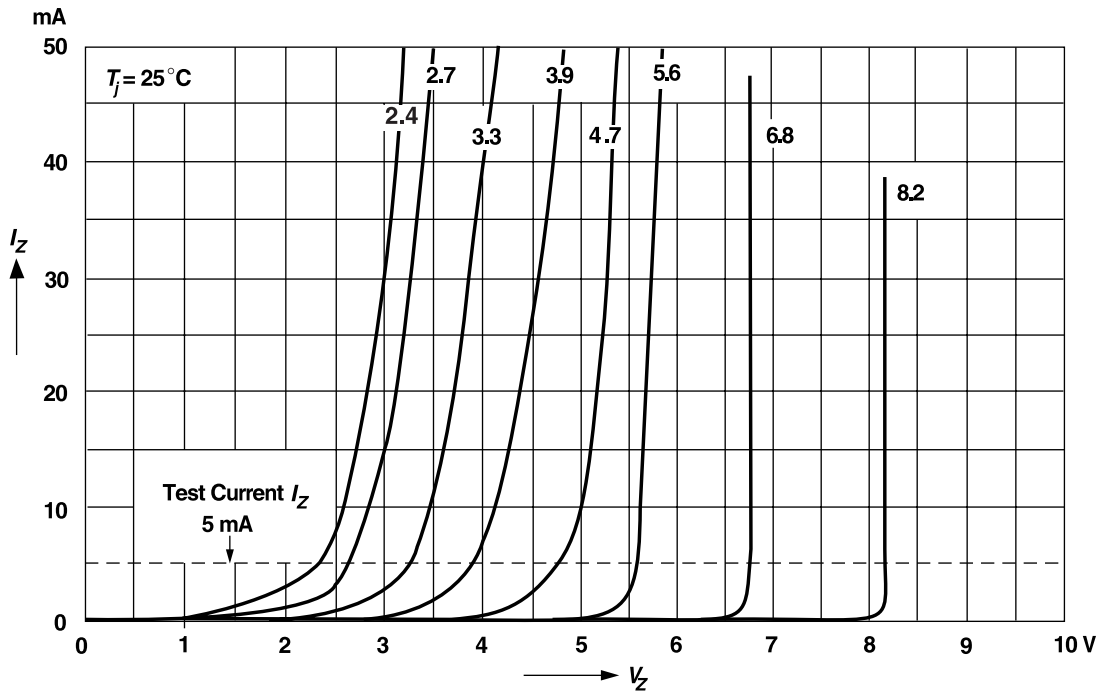
| Type ± 2% Tol. | Zener Voltage range ⁽¹⁾ at I _{ZT1} V _Z (V) | | Test Current I _{ZT1} (mA) |
|-------------------|---|------|---------------------------------------|
| | min. | max. | |
| BZX84-B2V4 | 2.35 | 2.45 | 5 |
| BZX84-B2V7 | 2.65 | 2.75 | 5 |
| BZX84-B3 | 2.94 | 3.06 | 5 |
| BZX84-B3V3 | 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_p = 5 ms

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

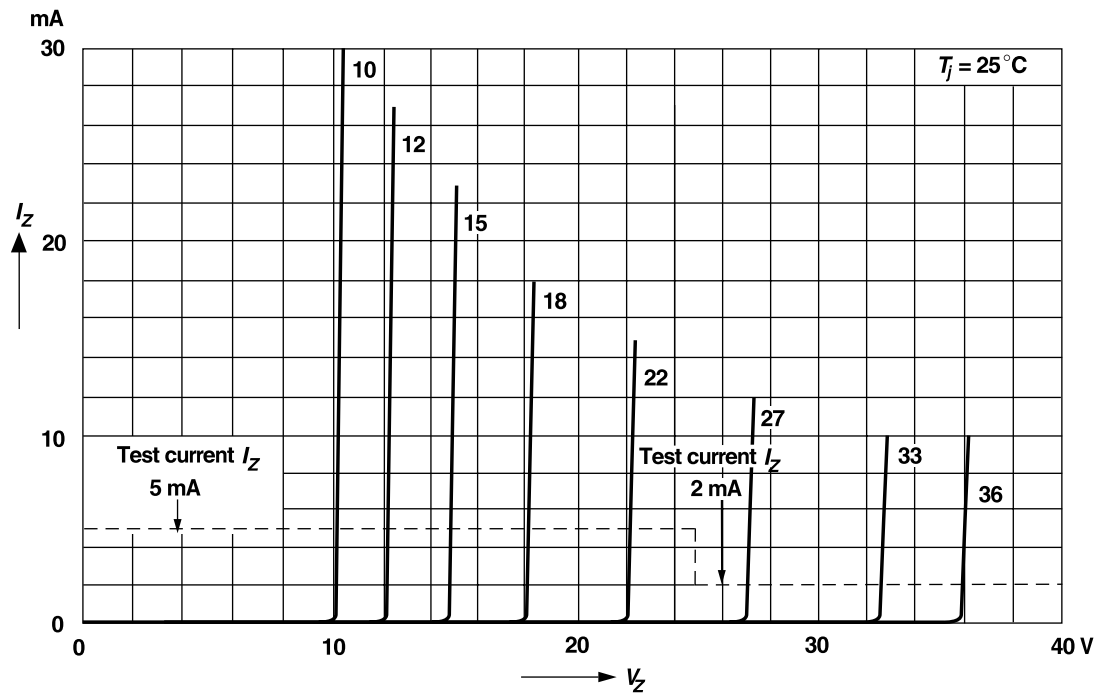
Breakdown characteristics

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



Breakdown characteristics

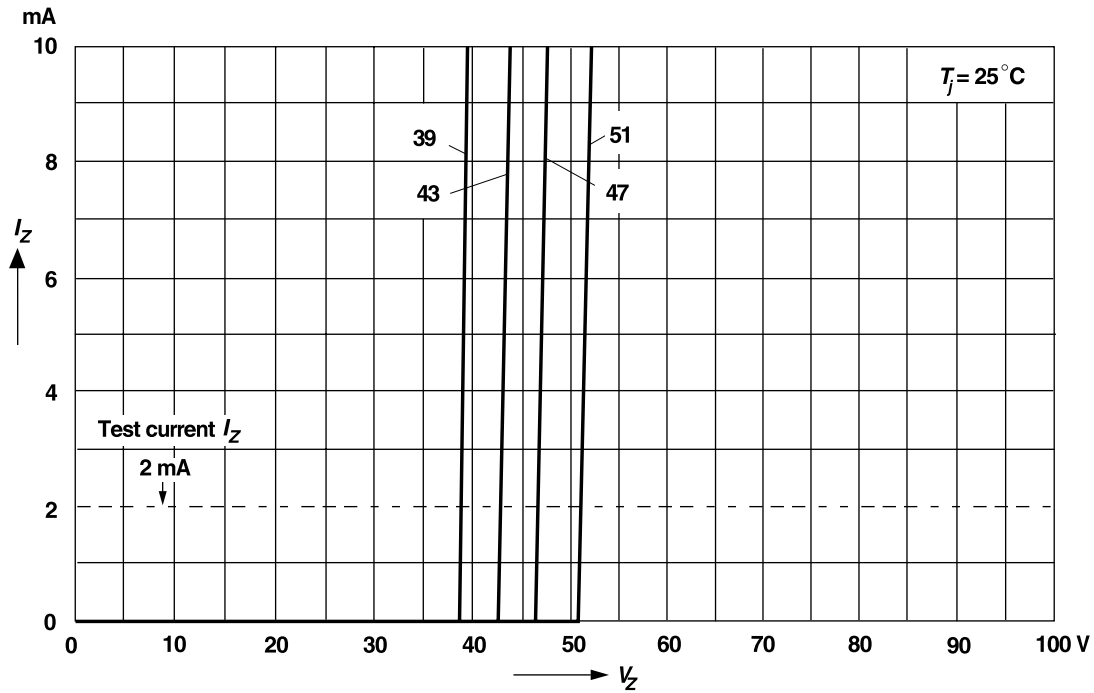
$T_j = \text{constant}$ (pulsed)



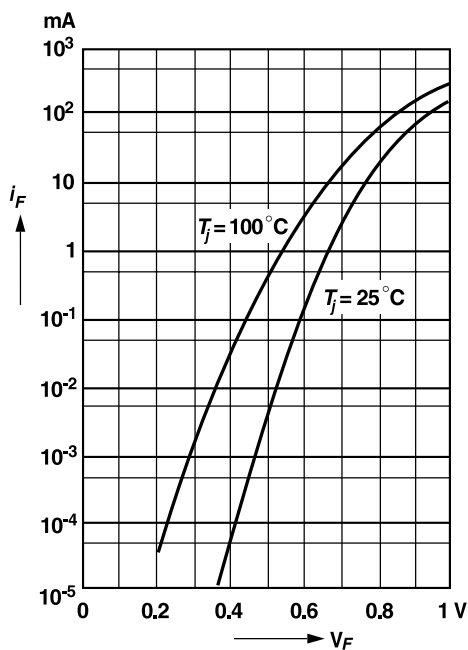
Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Breakdown characteristics

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

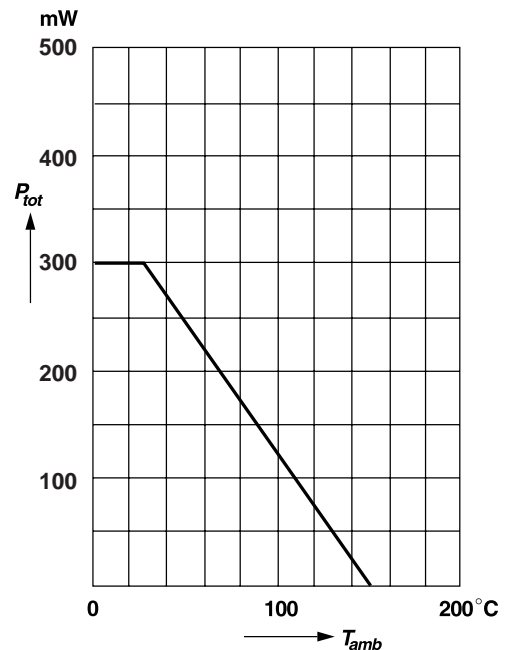


Forward characteristics



Admissible power dissipation versus ambient temperature

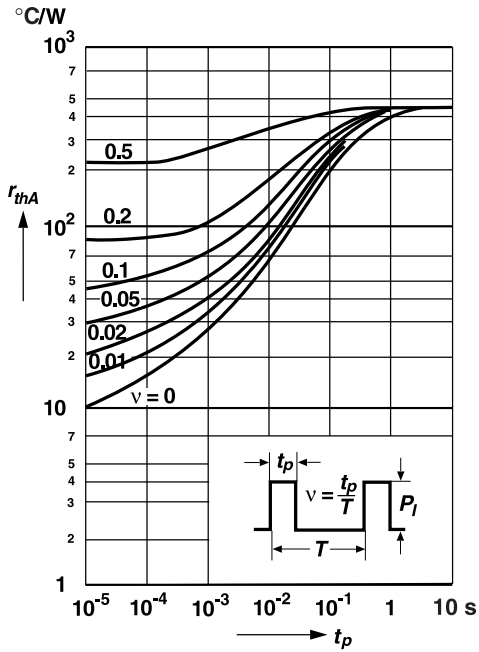
For conditions, see footnote in table "Absolute Maximum Ratings"



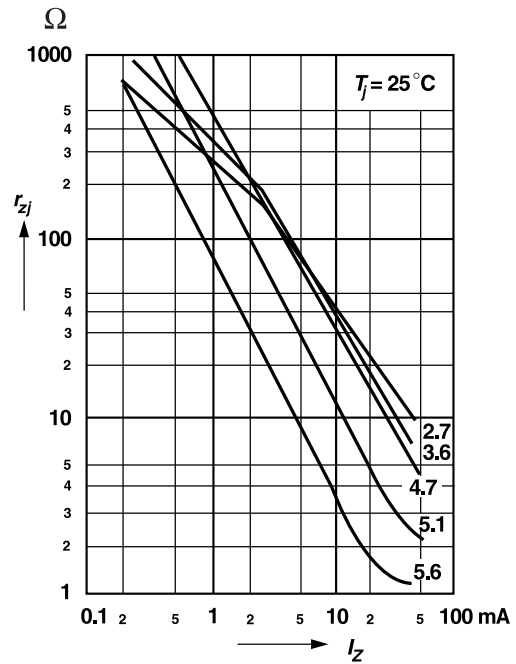
Ratings and Characteristic Curves (T_A = 25°C unless otherwise noted)

Pulse thermal resistance versus pulse duration

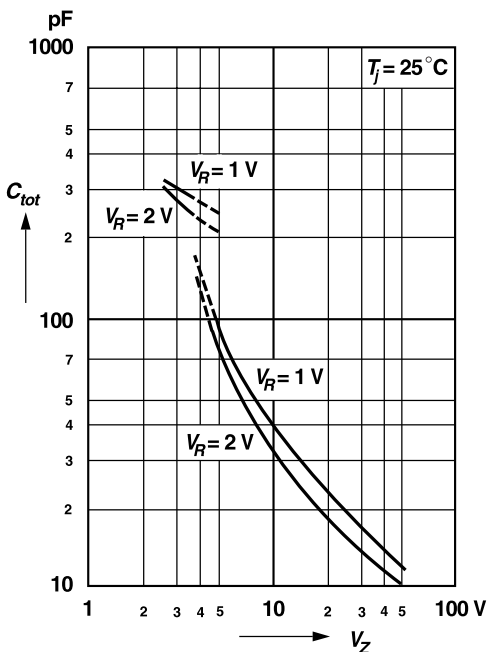
For conditions, see footnote in table "Absolute Maximum Ratings"



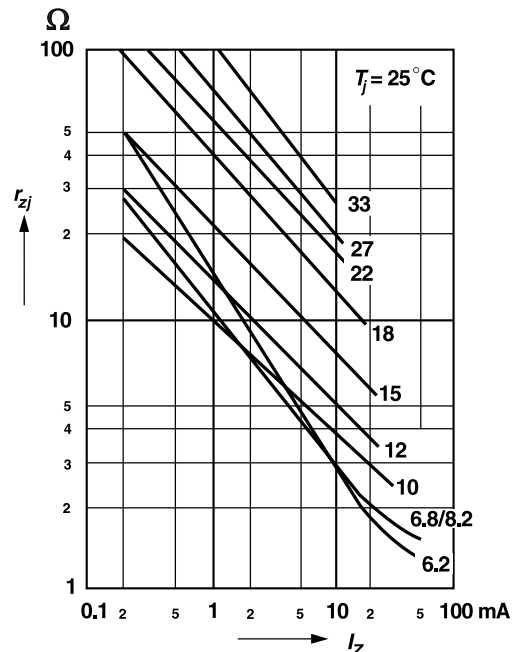
Dynamic resistance versus Zener current



Capacitance versus Zener voltage

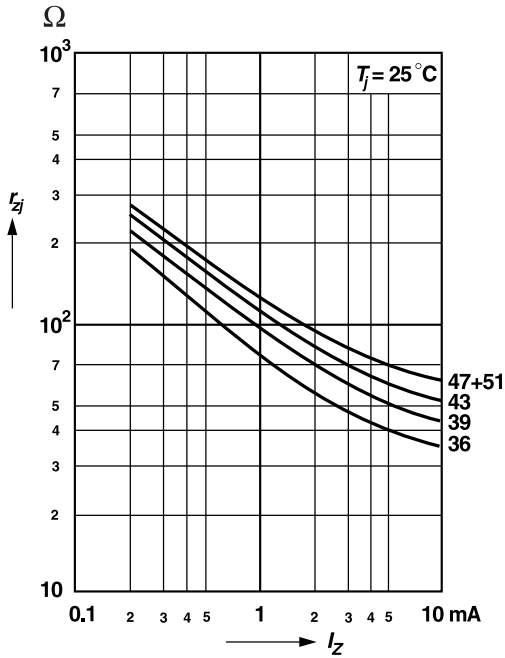


Dynamic resistance versus Zener current



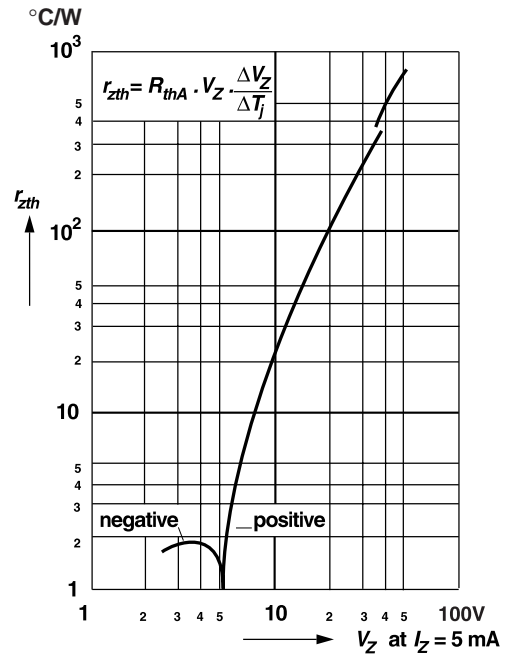
Ratings and Characteristic Curves (T_A = 25°C unless otherwise noted)

Dynamic resistance versus Zener current

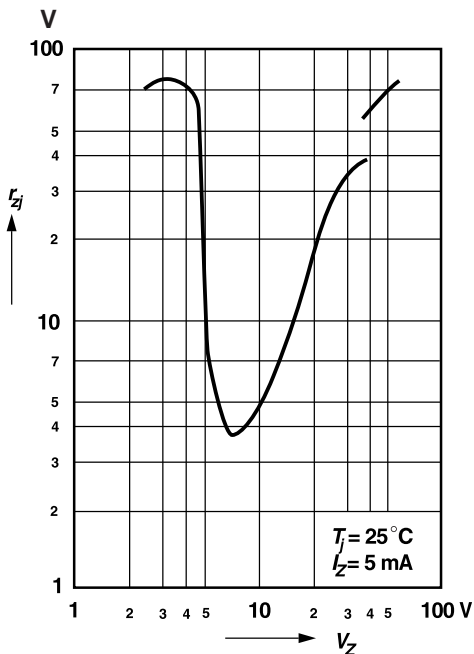


Thermal differential resistance versus Zener voltage

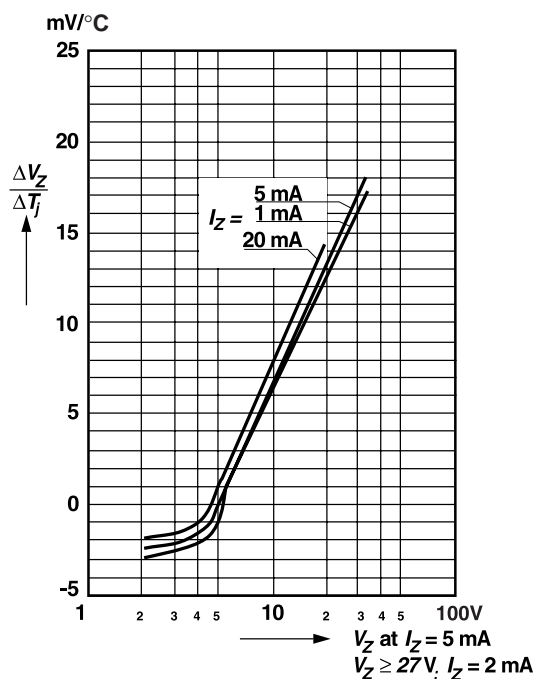
For conditions, see footnote in table "Absolute Maximum Ratings"



Dynamic resistance versus Zener voltage

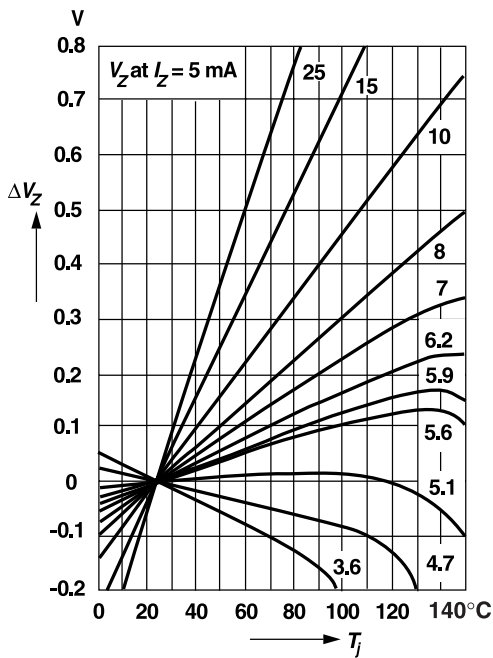


Temperature dependence of Zener voltage versus Zener voltage

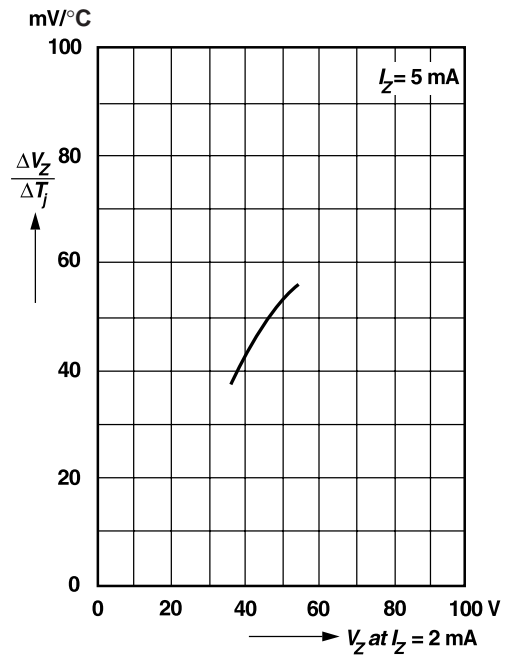


Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

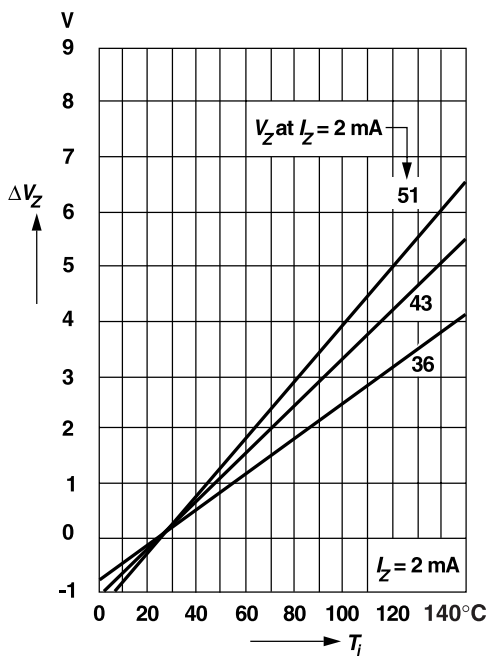
Change of Zener voltage versus junction temperature



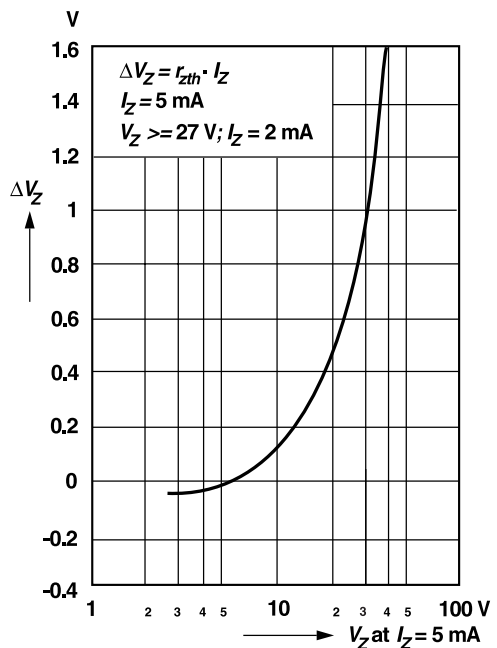
Temperature dependence of Zener voltage versus Zener voltage



Change of Zener voltage versus junction temperature

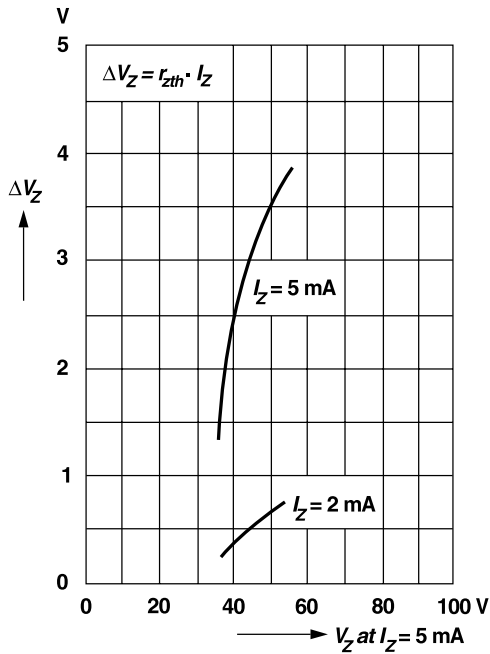


Change of Zener voltage from turn-on up to the point of thermal equilibrium versus Zener voltage



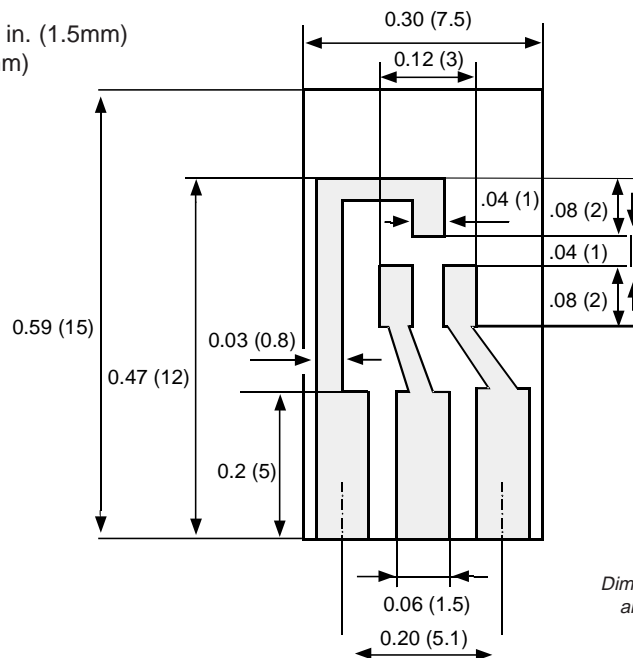
Ratings and Characteristic Curves (T_A = 25°C unless otherwise noted)

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



Layout for R_{θJA} test

Thickness: Fiberglass 0.059 in. (1.5mm)
Copper leads 0.012 in. (0.3mm)



Dimensions in inches and (millimeters)