



BZT52-S Series

200mW Surface Mount Zener Diodes - 2.4V - 75V



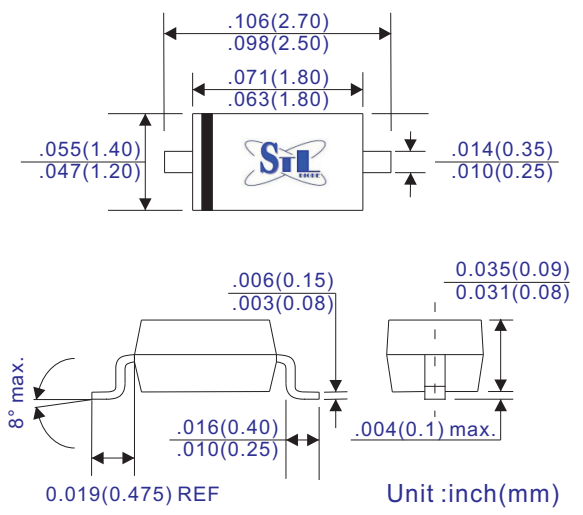
FEATURES

- For use as low voltage stabilizer or voltage reference
- Silicon epitaxial planar chip structions
- Also available in SOT-23 as BZX84 series, SOD-123 as BZT52 series, SOD-523 as BZT52-T series, SOT-323 as BZX84-W series, SOT-523 as BZX84-T series and SOD-80 as BZV55 series.
- Standard regulaion tolerance is $\pm 5\%$ with suffix "C", place suffix "C" with "B" for $\pm 2\%$
- Ultra small surface mounting type
- Lead-free parts for green partner

MECHANICAL DATA

- Case: Molded plastic SOD-323 case
- Epoxy: UL94-V0 rated flame retardant
- Terminals: Solderable per MIL-STD-202 Method 208
- Polarity: Color band denotes cathode end
- Mounting Position: Any
- Weight: 0.004 grams

SOD-323

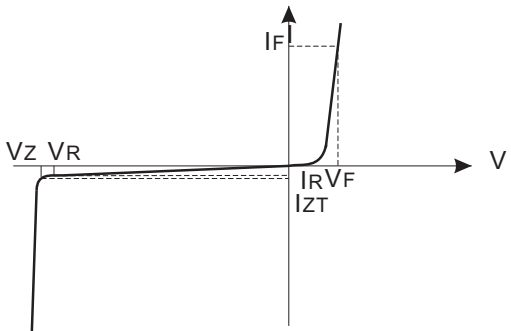


MAXIMUM RATING AND ELECTRICAL CHARACTERISTICS
 Ratings at 25°C ambient temperature unless otherwise specified

| | Symbols | BZT52-S Series | Units |
|-------------------------------------------------|-----------------|-----------------------|-------|
| Power Dissipation, Note 1 | P_d | 200 | mW |
| Zener Current | I_{ZM} | 250 | mA |
| Operating Junction Temperature Range | T_J | -65 ~ +150 | °C |
| Thermal Resistance, junction to ambient, Note 2 | $R_{\theta JA}$ | 650 | °C/W |
| Storage Temperature Range | T_{STG} | -65 ~ +150 | °C |
| Forward Voltage at $I_F=10mA$ | V_F | 0.9 | Volt |

Note 1. Device on fiberglass substrate
 2. Valid provided that electrodes are kept at ambient temperature

- Vz: Reverse Zener Voltage @ I_{ZT}
- I_{ZT} : Reverse Current
- ZZT: Maximum Zener Impedance @ I_{ZT}
- I_{ZK} : Reverse Current
- ZZK: Maximum Zener Impedance @ I_{ZK}
- I_R : Reverse Leakage Current @ V_R
- V_R : Reverse Voltage
- I_F : Forward Current
- V_F : Forward Voltage @ I_F



Zener Voltage Regulation



MAXIMUM RATING AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified

| Part No. | Electical Characteristics (Ta=25°C) | | | | | | | | Temp. Coefficient | |
|-------------|--------------------------------------|---------|------|----------|------|----------|-------------|--------------|-------------------|--------|
| | Vz(Min) | Vz(Max) | IzT | Max. ZzT | IzK | Max. ZzK | IR(uA) Max. | at IzT (%/K) | | |
| | (V) | (V) | (mA) | (Ω) | (mA) | (Ω) | VR(V) | Min. | Max. | |
| BZT52-C2V4S | 2.20 | 2.60 | 5.0 | 100 | 1.0 | 600 | 50 | 1 | -0.08 | -0.06 |
| BZT52-C2V7S | 2.50 | 2.90 | 5.0 | 100 | 1.0 | 600 | 20 | 1 | -0.09 | -0.04 |
| BZT52-C3V0S | 2.80 | 3.20 | 5.0 | 95 | 1.0 | 600 | 10 | 1 | -0.09 | -0.03 |
| BZT52-C3V3S | 3.10 | 3.50 | 5.0 | 95 | 1.0 | 600 | 5 | 1 | -0.08 | -0.03 |
| BZT52-C3V6S | 3.40 | 3.80 | 5.0 | 90 | 1.0 | 600 | 3 | 1 | -0.08 | -0.03 |
| BZT52-C3V9S | 3.70 | 4.10 | 5.0 | 90 | 1.0 | 600 | 3 | 1 | -0.07 | -0.03 |
| BZT52-C4V3S | 4.00 | 4.60 | 5.0 | 90 | 1.0 | 600 | 3 | 1 | -0.06 | -0.01 |
| BZT52-C4V7S | 4.40 | 5.00 | 5.0 | 80 | 1.0 | 500 | 2 | 2 | -0.05 | +0.02 |
| BZV52-C5V1S | 4.80 | 5.40 | 5.0 | 60 | 1.0 | 480 | 1 | 2 | -0.03 | +0.04 |
| BZT52-C5V6S | 5.20 | 6.00 | 5.0 | 40 | 1.0 | 400 | 3 | 2 | -0.02 | +0.06 |
| BZT52-C6V2S | 5.80 | 6.60 | 5.0 | 10 | 1.0 | 150 | 2 | 4 | -0.01 | +0.07 |
| BZT52-C6V8S | 6.40 | 7.20 | 5.0 | 15 | 1.0 | 80 | 1 | 4 | +0.02 | +0.07 |
| BZT52-C7V5S | 7.00 | 7.90 | 5.0 | 15.0 | 1.0 | 80 | 0.7 | 5 | +0.03 | +0.07 |
| BZT52-C8V2S | 7.70 | 8.70 | 5.0 | 15 | 1.0 | 80 | 0.5 | 5 | +0.04 | +0.07 |
| BZT52-C9V1S | 8.50 | 9.60 | 5.0 | 15 | 1.0 | 100 | 0.2 | 6 | +0.05 | +0.08 |
| BZT52-C10S | 9.40 | 10.60 | 5.0 | 20 | 1.0 | 150 | 0.1 | 7 | +0.05 | +0.08 |
| BZT52-C11S | 10.40 | 11.60 | 5.0 | 20.0 | 1.0 | 150 | 0.1 | 8 | +0.05 | +0.09 |
| BZT52-C12S | 11.40 | 12.70 | 5.0 | 25.0 | 1.0 | 150 | 0.1 | 8 | +0.06 | +0.09 |
| BZT52-C13S | 12.40 | 14.10 | 5.0 | 30.0 | 1.0 | 170 | 0.05 | 8 | +0.07 | +0.09 |
| BZT52-C15S | 13.80 | 15.60 | 5.0 | 30 | 1.0 | 200 | 0.05 | 10 | +0.07 | +0.09 |
| BZT52-C16S | 15.30 | 17.10 | 5.0 | 40 | 1.0 | 200 | 0.05 | 11 | +0.08 | +0.095 |
| BZT52-C18S | 16.80 | 19.10 | 5.0 | 45 | 1.0 | 225 | 0.05 | 13 | +0.08 | +0.095 |
| BZT52-C20S | 18.80 | 21.20 | 5.0 | 55 | 1.0 | 225 | 0.05 | 14 | +0.08 | +0.1 |
| BZT52-C22S | 20.80 | 23.30 | 5.0 | 55 | 1.0 | 250 | 0.05 | 15 | +0.08 | +0.1 |
| BZT52-C24S | 22.80 | 25.60 | 5.0 | 70 | 1.0 | 250 | 0.05 | 17 | +0.08 | +0.1 |
| BZT52-C27S | 25.10 | 28.90 | 2.0 | 80 | 0.5 | 300 | 0.05 | 19 | +0.08 | +0.1 |
| BZT52-C30S | 28.00 | 32.00 | 2.0 | 80 | 0.5 | 300 | 0.05 | 21 | +0.08 | +0.1 |
| BZT52-C33S | 31.00 | 35.00 | 2.0 | 80 | 0.5 | 325 | 0.05 | 23 | +0.08 | +0.1 |
| BZT52-C36S | 34.00 | 38.00 | 2.0 | 90 | 0.5 | 350 | 0.05 | 25 | +0.08 | +0.1 |
| BZT52-C39S | 37.00 | 41.00 | 2.0 | 130 | 0.5 | 350 | 0.05 | 27 | +0.1 | +0.12 |
| BZT52-C43S | 40.00 | 46.00 | 2.0 | 150 | 0.5 | 375 | 0.05 | 30 | +0.1 | +0.12 |
| BZT52-C47S | 44.00 | 50.00 | 2.0 | 170 | 0.5 | 375 | 0.05 | 33 | +0.1 | +0.12 |
| BZT52-C51S | 48.00 | 54.00 | 2.0 | 180 | 0.5 | 400 | 0.05 | 36 | +0.1 | +0.12 |
| BZT52-C56S | 52.00 | 60.00 | 2.0 | 200 | 0.5 | 425 | 0.05 | 39 | +0.1 | +0.1 |
| BZT52-C62S | 58.00 | 66.00 | 2.0 | 215 | 0.5 | 450 | 0.05 | 43 | +0.1 | +0.1 |
| BZT52-C68S | 64.00 | 72.00 | 2.0 | 240 | 0.5 | 475 | 0.05 | 48 | +0.1 | +0.1 |
| BZT52-C75S | 70.00 | 79.00 | 2.0 | 255 | 0.5 | 500 | 0.05 | 53 | +0.1 | +0.1 |

* The type number listed have zener voltages minimum & maximum limits as shown and have a standard tolerance on the nominal zener voltage 5%



MAXIMUM RATING AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified

| Part No. | Electical Characteristics (Ta=25°C) | | | | | | | | Temp. Coefficient | |
|-------------|--------------------------------------|---------|------|----------|------|----------|-------------|--------------|-------------------|--------|
| | Vz(Min) | Vz(Max) | IzT | Max. ZzT | IzK | Max. ZzK | IR(uA) Max. | at IzT (%/K) | | |
| | (V) | (V) | (mA) | (Ω) | (mA) | (Ω) | VR(V) | Min. | Max. | |
| BZT52-B2V4S | 2.35 | 2.45 | 5.0 | 100 | 1.0 | 600 | 50 | 1 | -0.08 | -0.06 |
| BZT52-B2V7S | 2.65 | 2.75 | 5.0 | 100 | 1.0 | 600 | 20 | 1 | -0.09 | -0.04 |
| BZT52-B3V0S | 2.94 | 3.06 | 5.0 | 95 | 1.0 | 600 | 10 | 1 | -0.09 | -0.03 |
| BZT52-B3V3S | 3.23 | 3.37 | 5.0 | 95 | 1.0 | 600 | 5 | 1 | -0.08 | -0.03 |
| BZT52-B3V6S | 3.53 | 3.67 | 5.0 | 90 | 1.0 | 600 | 3 | 1 | -0.08 | -0.03 |
| BZT52-B3V9S | 3.82 | 3.98 | 5.0 | 90 | 1.0 | 600 | 3 | 1 | -0.07 | -0.03 |
| BZT52-B4V3S | 4.21 | 4.39 | 5.0 | 90 | 1.0 | 600 | 3 | 1 | -0.06 | -0.01 |
| BZT52-B4V7S | 4.61 | 4.79 | 5.0 | 80 | 1.0 | 500 | 2 | 2 | -0.05 | +0.02 |
| BZV52-B5V1S | 5.00 | 5.20 | 5.0 | 60 | 1.0 | 480 | 1 | 2 | -0.03 | +0.04 |
| BZT52-B5V6S | 5.49 | 5.71 | 5.0 | 40 | 1.0 | 400 | 3 | 2 | -0.02 | +0.06 |
| BZT52-B6V2S | 6.08 | 6.32 | 5.0 | 10 | 1.0 | 150 | 2 | 4 | -0.01 | +0.07 |
| BZT52-B6V8S | 6.66 | 6.94 | 5.0 | 15 | 1.0 | 80 | 1 | 4 | +0.02 | +0.07 |
| BZT52-B7V5S | 7.35 | 7.65 | 5.0 | 15 | 1.0 | 80 | 0.7 | 5 | +0.03 | +0.07 |
| BZT52-B8V2S | 8.04 | 8.36 | 5.0 | 15 | 1.0 | 80 | 0.5 | 5 | +0.04 | +0.07 |
| BZT52-B9V1S | 8.92 | 9.28 | 5.0 | 15 | 1.0 | 100 | 0.2 | 6 | +0.05 | +0.08 |
| BZT52-B10S | 9.80 | 10.20 | 5.0 | 20 | 1.0 | 150 | 0.1 | 7 | +0.05 | +0.08 |
| BZT52-B11S | 10.80 | 11.20 | 5.0 | 20 | 1.0 | 150 | 0.1 | 8 | +0.05 | +0.09 |
| BZT52-B12S | 11.80 | 12.20 | 5.0 | 25 | 1.0 | 150 | 0.1 | 8 | +0.06 | +0.09 |
| BZT52-B13S | 12.70 | 13.30 | 5.0 | 30 | 1.0 | 170 | 0.05 | 8 | +0.07 | +0.09 |
| BZT52-B15S | 14.70 | 15.30 | 5.0 | 30 | 1.0 | 200 | 0.05 | 10 | +0.07 | +0.09 |
| BZT52-B16S | 15.70 | 16.30 | 5.0 | 40 | 1.0 | 200 | 0.05 | 11 | +0.08 | +0.095 |
| BZT52-B18S | 17.60 | 18.40 | 5.0 | 45 | 1.0 | 225 | 0.05 | 13 | +0.08 | +0.095 |
| BZT52-B20S | 19.60 | 20.40 | 5.0 | 55 | 1.0 | 225 | 0.05 | 14 | +0.08 | +0.1 |
| BZT52-B22S | 21.60 | 22.40 | 5.0 | 55 | 1.0 | 250 | 0.05 | 15 | +0.08 | +0.1 |
| BZT52-B24S | 23.50 | 24.50 | 5.0 | 70 | 1.0 | 250 | 0.05 | 17 | +0.08 | +0.1 |
| BZT52-B27S | 26.50 | 27.50 | 2.0 | 80 | 0.5 | 300 | 0.05 | 19 | +0.08 | +0.1 |
| BZT52-B30S | 29.40 | 30.60 | 2.0 | 80 | 0.5 | 300 | 0.05 | 21 | +0.08 | +0.1 |
| BZT52-B33S | 32.30 | 33.70 | 2.0 | 80 | 0.5 | 325 | 0.05 | 23 | +0.08 | +0.1 |
| BZT52-B36S | 35.30 | 36.70 | 2.0 | 90 | 0.5 | 350 | 0.05 | 25 | +0.08 | +0.1 |
| BZT52-B39S | 38.20 | 39.80 | 2.0 | 130 | 0.5 | 350 | 0.05 | 27 | +0.1 | +0.12 |
| BZT52-B43S | 42.10 | 43.90 | 2.0 | 150 | 0.5 | 375 | 0.05 | 30 | +0.1 | +0.12 |
| BZT52-B47S | 46.10 | 47.90 | 2.0 | 170 | 0.5 | 375 | 0.05 | 33 | +0.1 | +0.12 |
| BZT52-B51S | 50.00 | 52.00 | 2.0 | 180 | 0.5 | 400 | 0.05 | 36 | +0.1 | +0.12 |
| BZT52-B56S | 54.90 | 57.10 | 2.0 | 200 | 0.5 | 425 | 0.05 | 39 | +0.1 | +0.1 |
| BZT52-B62S | 60.80 | 63.20 | 2.0 | 215 | 0.5 | 450 | 0.05 | 43 | +0.1 | +0.1 |
| BZT52-B68S | 66.60 | 69.40 | 2.0 | 240 | 0.5 | 475 | 0.05 | 48 | +0.1 | +0.1 |
| BZT52-B75S | 73.50 | 79.50 | 2.0 | 255 | 0.5 | 500 | 0.05 | 53 | +0.1 | +0.1 |

* The type number listed have zener voltages minimum & maximum limits as shown and have a standard tolerance on the nominal zener voltage 2%



Fig. 1A - Zener Voltage vs Zener Current Curve

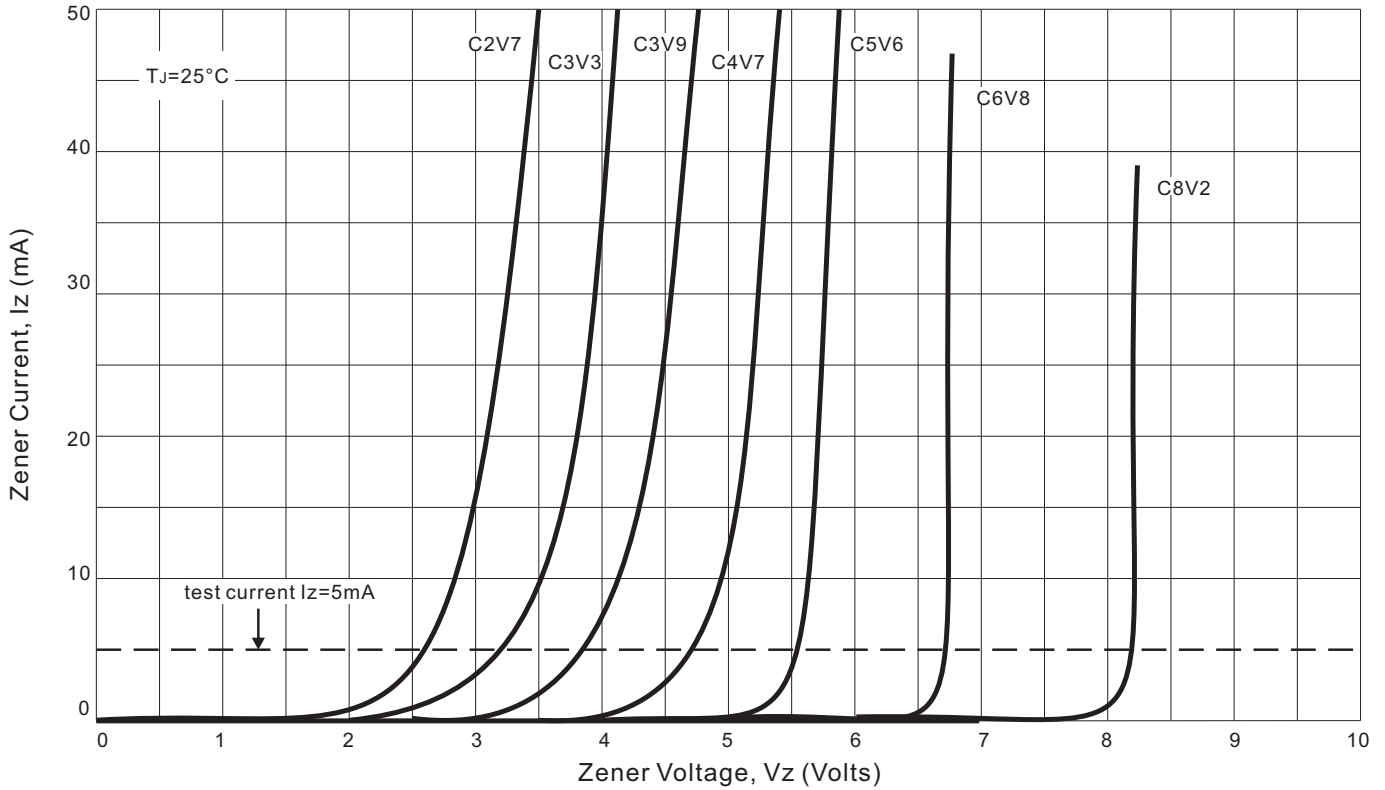


Fig. 1B - Zener Voltage vs Zener Current Curve

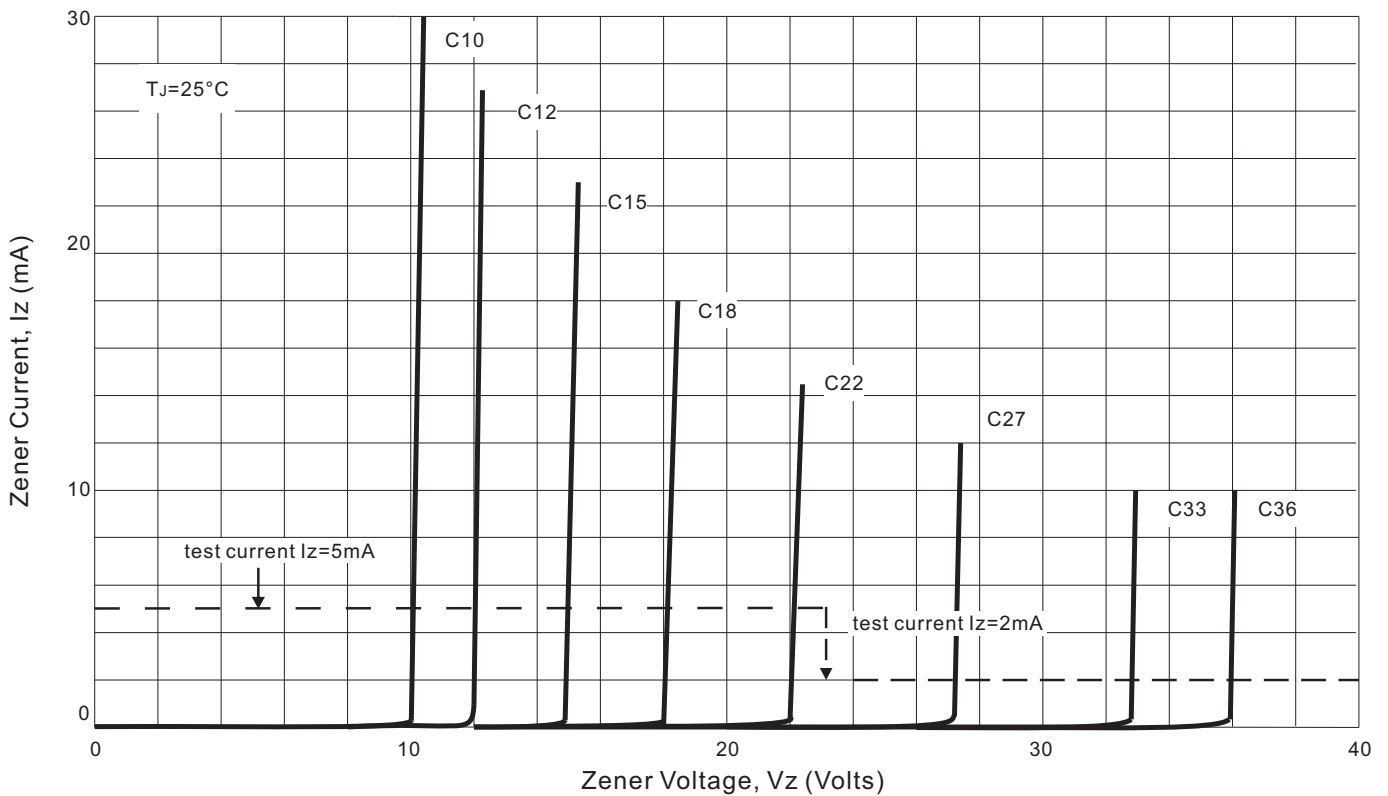




Fig. 1C - Zener Voltage vs Zener Current Curve

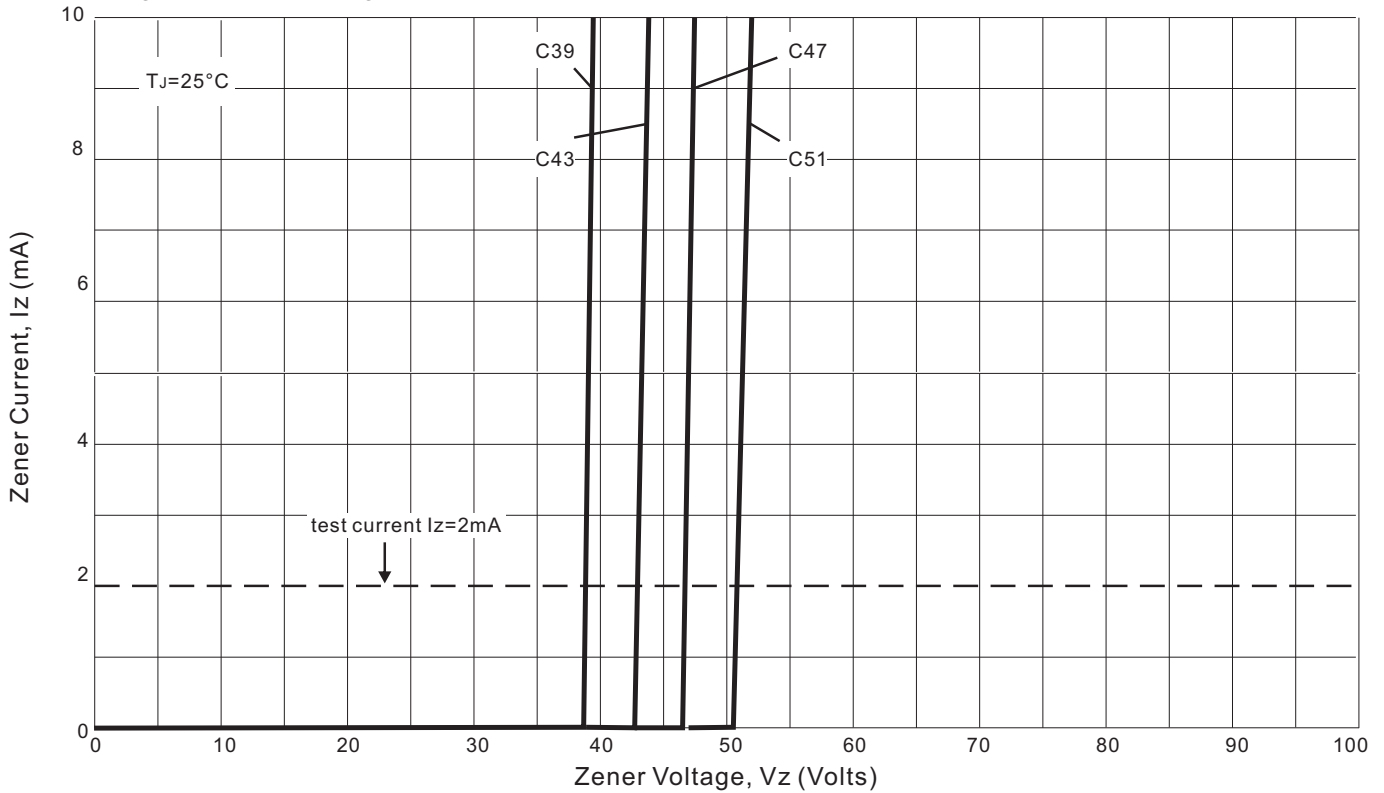


Fig. 2A - Dynamic Resistance Curve

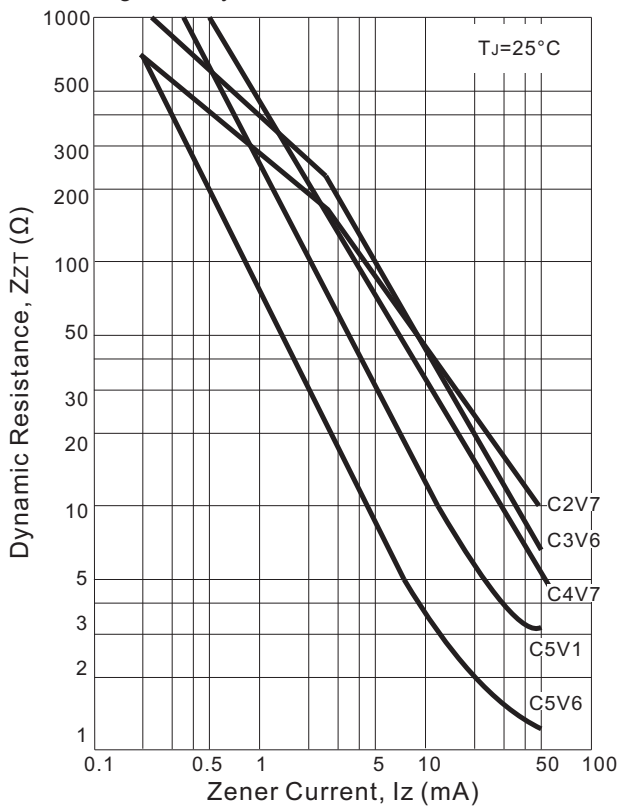


Fig. 2B - Dynamic Resistance Curve

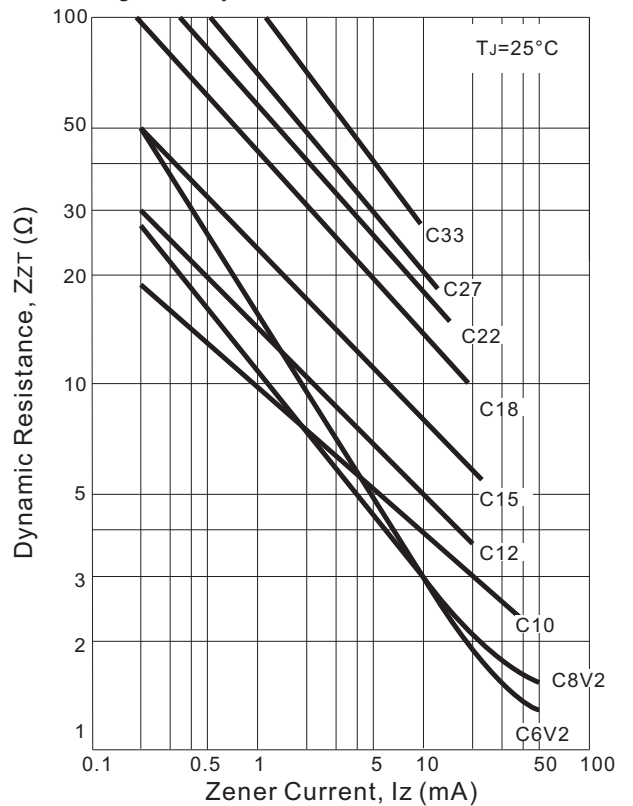




Fig. 3 - Power Dissipation Derating Curve

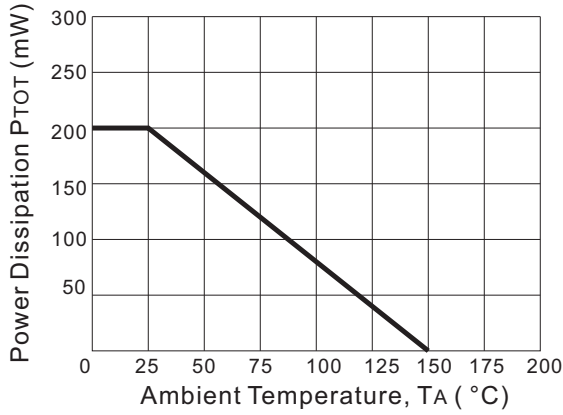


Fig. 4 - Change of Zener Voltage Curve

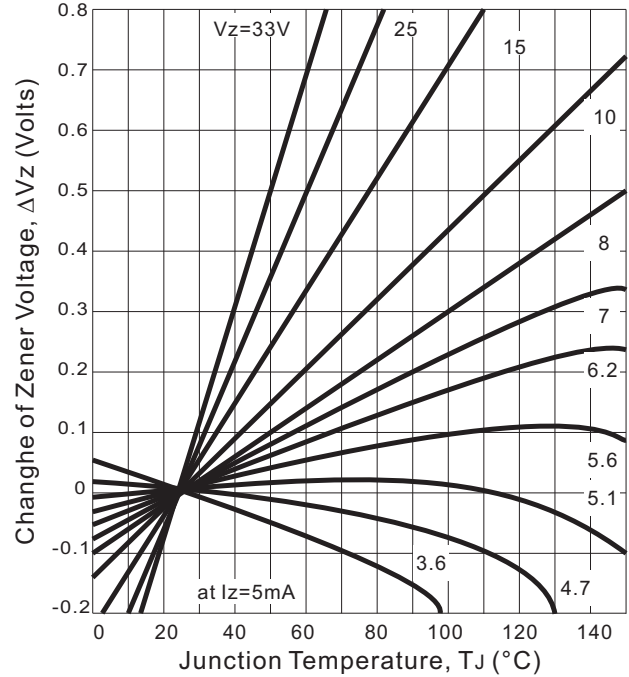


Fig. 5 - Capacitance Curve

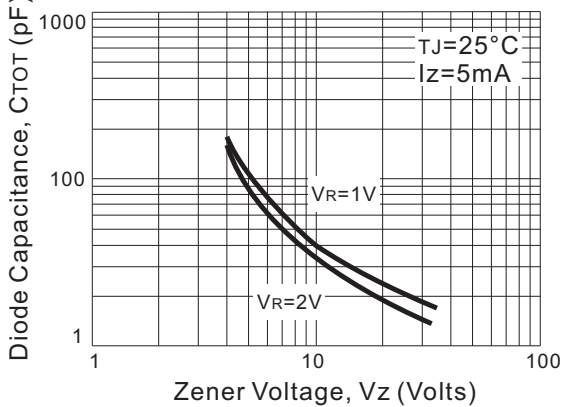


Fig. 7 - Pulse Thermal Resistance curve
 Valid provided that leads are kept at ambient temperature at a distance of 8 mm from case

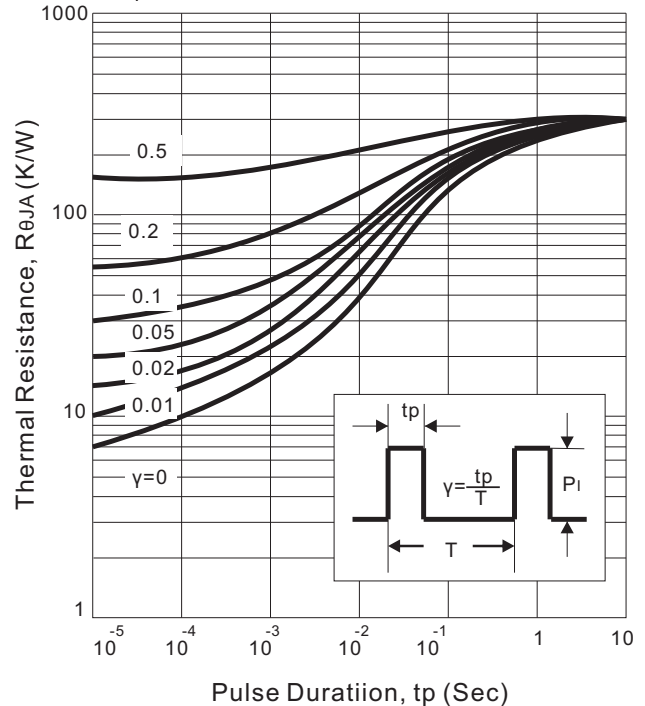


Fig. 6 - Dynamic Resistance Curve

