# 300mW DUAL SURFACE MOUNT ZENER DIODE

## Features

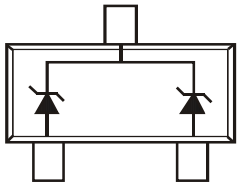
- Dual Zeners in Common Cathode Configuration
- 300mW Power Dissipation
- Ideally Suited for Automated Insertion
- $\Delta V_Z$ For Both Diodes in One Case is ≤ 5%
- Common Anode Style Available, See AZ23 Series
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

## Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Lead Frame (Lead Free Plating). Solderable per MIL-STD-202, Method 208 e3
- Polarity: See Diagram
- Weight: 0.008 grams (Approximate)

SOT23

Top View



Device Schematic

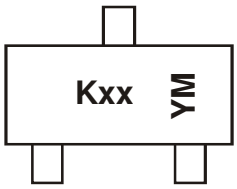
## Ordering Information (Note 4)

| Part Number | Qualification | Packaging | Shipping |
|---|---|---|---|
| (Type Number)-7-F* | Commercial | SOT23 | 3000/Tape & Reel |
| (Type Number)Q-7-F* | Automotive | SOT23 | 3000/Tape & Reel |

*Add "-7-F" to the appropriate type number in Electrical Characteristics Table on Page 2. Example: 6.2V Zener = DZ23C6V2-7-F.

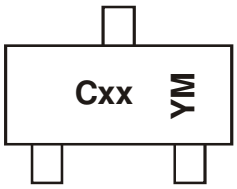
Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

## Marking Information




K = SAT (Shanghai Assembly / Test Site)
xx = Product Type Marking Code
See Electrical Characteristics Table
YM = Date Code Marking
Y = Year (ex: I = 2021)
M = Month (ex: 9 = September)

For DZ23C15-7-F only:
Assembly/Test in Shanghai or Chuzhou
M or $\overline{M}$ = Month (ex: 9 = September)




C = CAT (Chengdu Assembly / Test Site)
xx = Product Type Marking Code
See Electrical Characteristics Table
YM = Date Code Marking
Y = Year (ex: I = 2021)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2013 | …… | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | A | …… | I | J | K | L | M | N | O | P | R | S |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation (Note 5) | $P_D$ | 300 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 5) | $R_{\theta JA}$ | 417 | °C/W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -65 to +150 | °C |

Note: 5. Mounted on FR4 PC Board with recommended pad layout which can be found on our website at http://www.diodes.com.

## Electrical Characteristics (@ $T_A$ = +25°C, unless otherwise specified.)

| Type Number | Marking Code | Zener Voltage Range (Note 6) | Maximum Zener Impedance f = 1kHz | | Typical Temperature Coefficient | Minimum Reverse Voltage (Note 6) |
|---|---|---|---|---|---|---|
| | | @ $I_{ZT}$ = 5.0mA | $Z_{ZT}$ @ $I_{ZT}$ = 5.0mA | $Z_{ZK}$ @ $I_{ZK}$ = 1.0mA | | @ $I_R$ = 0.1µA |
| | | $V_Z$ (V) | Ω | Ω | TC (%/°C) | $V_R$ (V) |
| DZ23C2V7 | V1 | 2.5 to 2.9 | 83 | 500 | -0.065 | — |
| DZ23C3V0 | V2 | 2.8 to 3.2 | 95 | 500 | -0.060 | — |
| DZ23C3V3 | V3 | 3.1 to 3.5 | 95 | 500 | -0.055 | — |
| DZ23C3V6 | V4 | 3.4 to 3.8 | 95 | 500 | -0.055 | — |
| DZ23C3V9 | V5 | 3.7 to 4.1 | 95 | 500 | -0.050 | — |
| DZ23C4V3 | V6 | 4.0 to 4.6 | 95 | 500 | -0.035 | — |
| DZ23C4V7 | V7 | 4.4 to 5.0 | 78 | 500 | -0.015 | — |
| DZ23C5V1 | V8 | 4.8 to 5.4 | 60 | 480 | +0.005 | 0.8 |
| DZ23C5V6 | V9 | 5.2 to 6.0 | 40 | 400 | +0.020 | 1.0 |
| DZ23C6V2 | VA | 5.8 to 6.6 | 10 | 200 | +0.030 | 2.0 |
| DZ23C6V8 | VB | 6.4 to 7.2 | 8.0 | 150 | +0.045 | 3.0 |
| DZ23C7V5 | VC | 7.0 to 7.9 | 7.0 | 50 | +0.050 | 5.0 |
| DZ23C8V2 | VD | 7.7 to 8.7 | 7.0 | 50 | +0.055 | 6.0 |
| DZ23C9V1 | VE | 8.5 to 9.6 | 10 | 50 | +0.065 | 7.0 |
| DZ23C10 | VF | 9.4 to 10.6 | 15 | 70 | +0.065 | 7.5 |
| DZ23C11 | VG | 10.4 to 11.6 | 20 | 70 | +0.070 | 8.5 |
| DZ23C12 | VH | 11.4 to 12.7 | 20 | 90 | +0.075 | 9.0 |
| DZ23C13 | VI | 12.4 to 14.1 | 25 | 110 | +0.080 | 10.0 |
| DZ23C15 | VJ | 13.8 to 15.6 | 30 | 110 | +0.080 | 11.0 |
| DZ23C16 | VK | 15.3 to 17.1 | 40 | 170 | +0.090 | 12.0 |
| DZ23C18 | VL | 16.8 to 19.1 | 50 | 170 | +0.090 | 14.0 |
| DZ23C20 | VM | 18.8 to 21.2 | 50 | 220 | +0.090 | 15.0 |
| DZ23C22 | VN | 20.8 to 23.3 | 55 | 220 | +0.090 | 17.0 |
| DZ23C24 | VO | 22.8 to 25.6 | 80 | 220 | +0.090 | 18.0 |
| DZ23C27 | VP | 25.1 to 28.9 | 80 | 250 | +0.090 | 20.0 |
| DZ23C30 | VQ | 28 to 32 | 80 | 250 | +0.090 | 22.5 |
| DZ23C33 | VR | 31 to 35 | 80 | 250 | +0.090 | 25.0 |
| DZ23C36 | VS | 34 to 38 | 90 | 250 | +0.090 | 27.0 |
| DZ23C39 | VT | 37 to 41 | 90 | 300 | +0.110 | 29.0 |
| DZ23C43 | VU | 40 to 46 | 100 | 700 | +0.110 | 32.0 |
| DZ23C47 | VV | 44 to 50 | 100 | 750 | +0.110 | 35.0 |
| DZ23C51 | VW | 48 to 54 | 100 | 750 | +0.110 | 38.0 |

Note: 6. Short duration pulse test used to minimize self-heating effect.

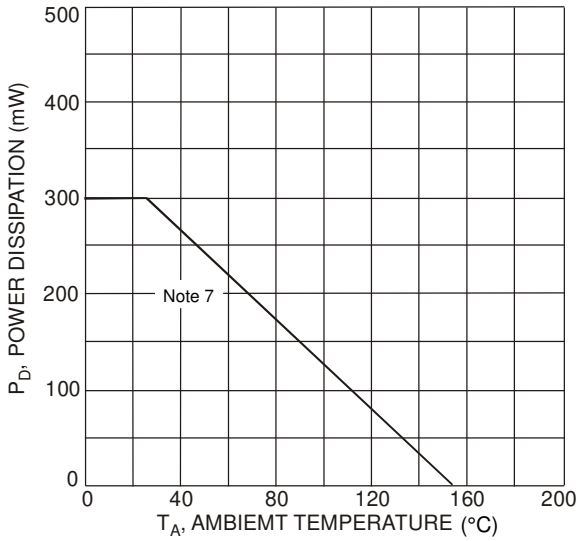



Fig. 1 Power Derating Curve

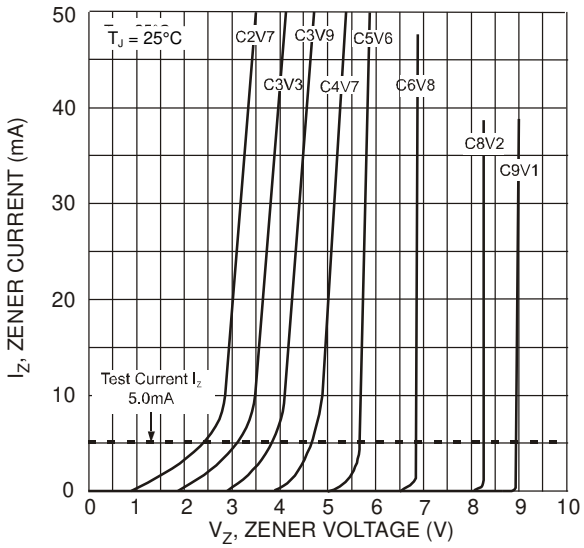



Fig. 2 Typical Zener Breakdown Characteristics

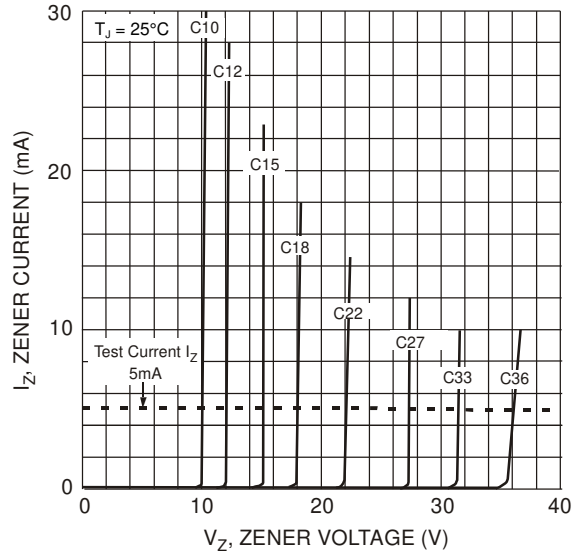



Fig. 3 Typical Zener Breakdown Characteristics

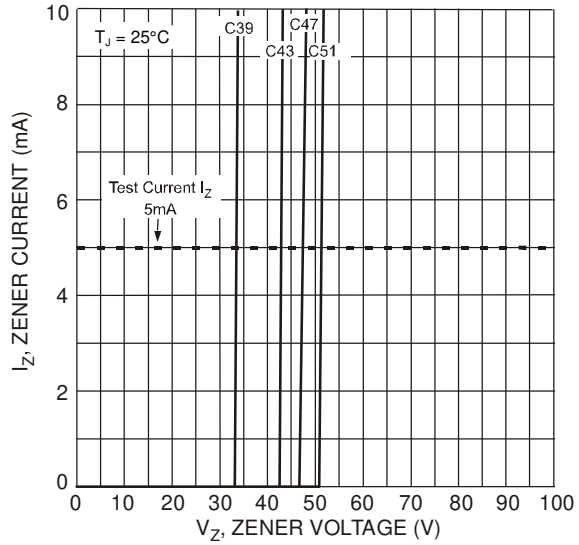



Fig. 4 Typical Zener Breakdown Characteristics

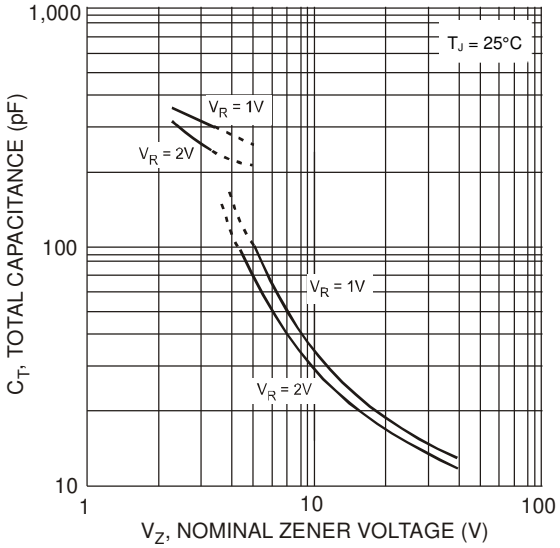
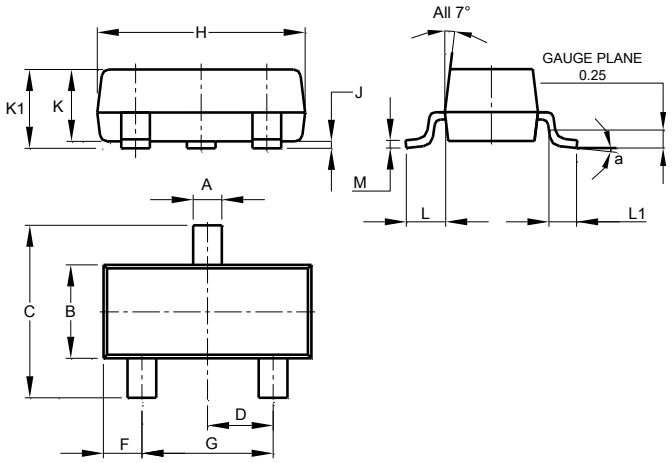



Fig. 5 Typical Total Capacitance vs. Nominal Zener Voltage

## Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

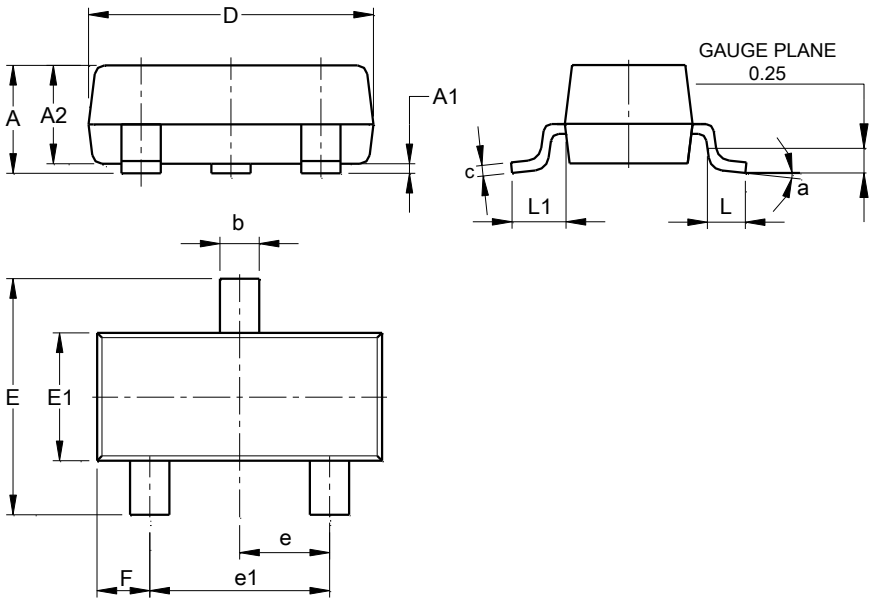
**SOT23**




| SOT23 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.37 | 0.51 | 0.40 |
| **B** | 1.20 | 1.40 | 1.30 |
| **C** | 2.30 | 2.50 | 2.40 |
| **D** | 0.89 | 1.03 | 0.915 |
| **F** | 0.45 | 0.60 | 0.535 |
| **G** | 1.78 | 2.05 | 1.83 |
| **H** | 2.80 | 3.00 | 2.90 |
| **J** | 0.013 | 0.10 | 0.05 |
| **K** | 0.890 | 1.00 | 0.975 |
| **K1** | 0.903 | 1.10 | 1.025 |
| **L** | 0.45 | 0.61 | 0.55 |
| **L1** | 0.25 | 0.55 | 0.40 |
| **M** | 0.085 | 0.150 | 0.110 |
| **a** | 0° | 8° | -- |
| **All Dimensions in mm** | | | |

**For DZ23C15-7-F only:**

**SOT23 (Standard)**

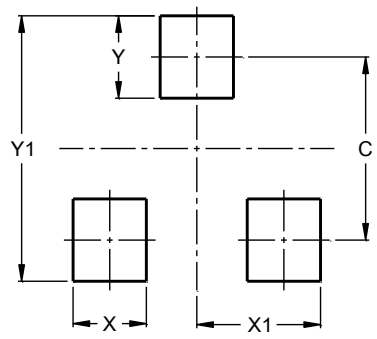



| SOT23 (Standard) | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.90 | 1.15 | 1.025 |
| **A1** | 0.00 | 0.10 | 0.05 |
| **A2** | 0.85 | 1.10 | 0.975 |
| **b** | 0.30 | 0.51 | 0.40 |
| **c** | 0.080 | 0.202 | 0.11 |
| **D** | 2.80 | 3.00 | 2.90 |
| **E** | 2.25 | 2.55 | 2.40 |
| **E1** | 1.20 | 1.40 | 1.30 |
| **e** | 0.89 | 1.03 | 0.915 |
| **e1** | 1.78 | 2.05 | 1.83 |
| **F** | 0.40 | 0.60 | 0.535 |
| **L1** | 0.45 | 0.61 | 0.55 |
| **L** | 0.25 | 0.55 | 0.40 |
| **a** | 0° | 8° | -- |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

**SOT23**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 2.0 |
| **X** | 0.8 |
| **X1** | 1.35 |
| **Y** | 0.9 |
| **Y1** | 2.9 |

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