



**THE DATASHEET OF
AZ23C13-7-F**



Features

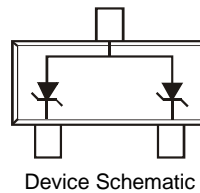
- Dual Zeners in Common Anode Configuration
- 300mW Power Dissipation Rating
- Ideally Suited for Automated Insertion
- ΔV_Z for Both Diodes in One Case is $\leq 5\%$
- Common Cathode Style Available See DZ Series
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

ESD Sensitivity Rating

- AEC-Q101, HBM - 8kV, MM - 400V
- IEC 61000-4-2, Air - 15kV, Contact - 8kV

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 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208^③
- Polarity: See Diagram
- Approximate Weight: 0.008 grams



Ordering Information (Note 5)

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

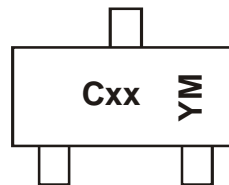
*Add "-7-F" to the appropriate type number in Electrical Characteristics Table on Page 2 example: 6.2V Zener = AZ23C6V2-7F.

- 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 http://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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to <https://www.diodes.com/quality/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



K/D = SAT (Shanghai Assembly / Test site)
 xx = Product Type Marking Code
 See Electrical Characteristics Table
 YM = Date Code Marking
 Y = Year (ex: F = 2018)
 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: F = 2018)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | B | C | D | E | F | G | H | I | J | K | L |

| 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 6) | P_D | 300 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 6) | $R_{\theta JA}$ | 417 | $^{\circ}C/W$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -65 to +150 | $^{\circ}C$ |

Note: 6. Mounted on FR-4 PC Board with recommended pad layout which can be found on our website at <http://www.diodes.com/package-outlines.html>.

Electrical Characteristics (@ $T_A = +25^{\circ}C$, unless otherwise specified.)

| Type Number | Marking Code | Zener Voltage Range (Note 7) | Maximum Zener Impedance $f = 1\text{kHz}$ | | Typical Temperature Coefficient T_C (%/ $^{\circ}C$) | Min. Reverse Voltage (Note 7) @ $I_R = 0.1\mu A$ V_R (V) |
|-------------|--------------|------------------------------|--|------------------------------------|--|--|
| | | @ $I_{ZT} = 5.0\text{mA}$ | Z_{ZT} @ $I_{ZT} = 5.0\text{mA}$ | Z_{ZK} @ $I_{ZK} = 1.0\text{mA}$ | | |
| | | V_Z (V) | Ω | Ω | | |
| AZ23C2V7 | D1 | 2.5 to 2.9 | 83 | 500 | -0.065 | — |
| AZ23C3V0 | D2 | 2.8 to 3.2 | 95 | 500 | -0.060 | — |
| AZ23C3V3 | D3 | 3.1 to 3.5 | 95 | 500 | -0.055 | — |
| AZ23C3V6 | D4 | 3.4 to 3.8 | 95 | 500 | -0.055 | — |
| AZ23C3V9 | D5 | 3.7 to 4.1 | 95 | 500 | -0.050 | — |
| AZ23C4V3 | D6 | 4.0 to 4.6 | 95 | 500 | -0.035 | — |
| AZ23C4V7 | D7 | 4.4 to 5.0 | 78 | 500 | -0.015 | — |
| AZ23C5V1 | D8 | 4.8 to 5.4 | 60 | 480 | 0.005 | 0.8 |
| AZ23C5V6 | D9 | 5.2 to 6.0 | 40 | 400 | 0.020 | 1.0 |
| AZ23C6V2 | DA | 5.8 to 6.6 | 10 | 200 | 0.030 | 2.0 |
| AZ23C6V8 | DB | 6.4 to 7.2 | 8.0 | 150 | 0.045 | 3.0 |
| AZ23C7V5 | DC | 7.0 to 7.9 | 7.0 | 50 | 0.050 | 5.0 |
| AZ23C8V2 | DD | 7.7 to 8.7 | 7.0 | 50 | 0.055 | 6.0 |
| AZ23C9V1 | DE | 8.5 to 9.6 | 10 | 50 | 0.065 | 7.0 |
| AZ23C10 | DF | 9.4 to 10.6 | 15 | 70 | 0.065 | 7.5 |
| AZ23C11 | DG | 10.4 to 11.6 | 20 | 70 | 0.070 | 8.5 |
| AZ23C12 | DH | 11.4 to 12.7 | 20 | 90 | 0.075 | 9.0 |
| AZ23C13 | DI | 12.4 to 14.1 | 25 | 110 | 0.080 | 10.0 |
| AZ23C15 | DJ | 13.8 to 15.6 | 30 | 110 | 0.080 | 11.0 |
| AZ23C16 | DK | 15.3 to 17.1 | 40 | 170 | 0.090 | 12.0 |
| AZ23C18 | DL | 16.8 to 19.1 | 50 | 170 | 0.090 | 14.0 |
| AZ23C20 | DM | 18.8 to 21.2 | 50 | 220 | 0.090 | 15.0 |
| AZ23C22 | DN | 20.8 to 23.3 | 55 | 220 | 0.090 | 17.0 |
| AZ23C24 | DO | 22.8 to 25.6 | 80 | 220 | 0.090 | 18.0 |
| AZ23C27 | DP | 25.1 to 28.9 | 80 | 250 | 0.090 | 20.0 |
| AZ23C30 | DQ | 28 to 32 | 80 | 250 | 0.090 | 22.5 |
| AZ23C33 | DR | 31 to 35 | 80 | 250 | 0.090 | 25.0 |
| AZ23C36 | DS | 34 to 38 | 90 | 250 | 0.090 | 27.0 |
| AZ23C39 | DT | 37 to 41 | 90 | 300 | 0.110 | 29.0 |
| AZ23C43 | 30 | 40 to 46 | 100 | 700 | 0.110 | 32.0 |
| AZ23C47 | 31 | 44 to 50 | 100 | 750 | 0.110 | 35.0 |
| AZ23C51 | 32 | 48 to 54 | 100 | 750 | 0.110 | 38.0 |

Note: 7. Short duration pulse test used to minimize self-heating effect.

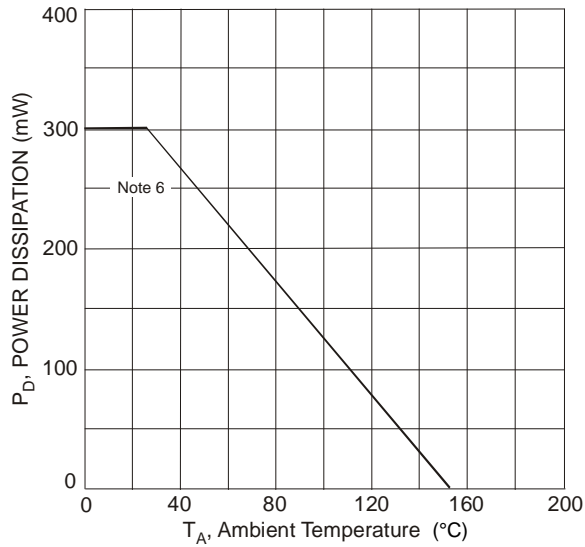


Fig. 1 Power Derating Curve

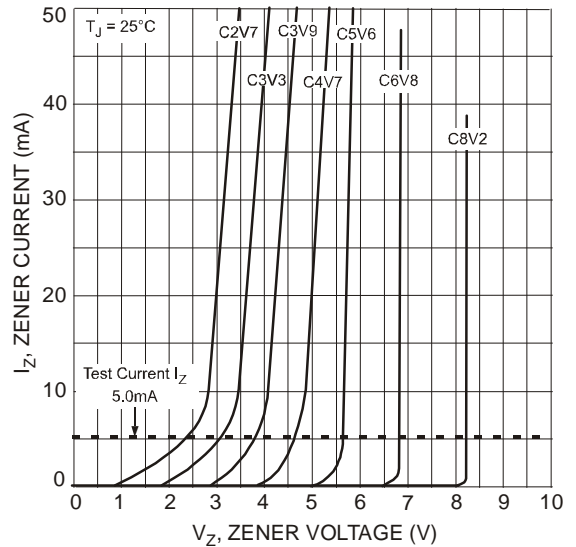


Fig. 2 Typical Zener Breakdown Characteristics

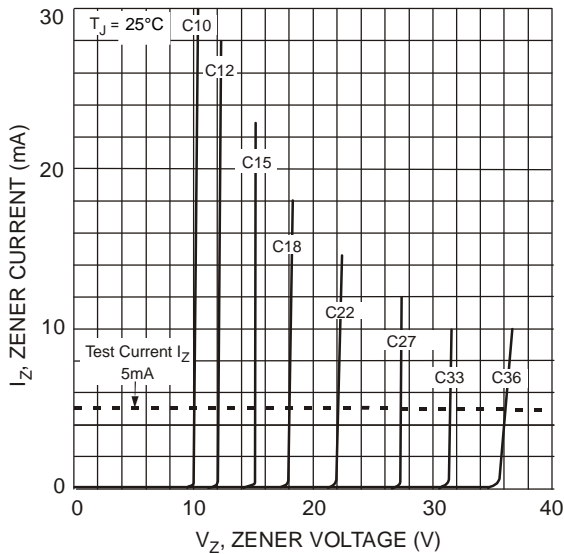


Fig. 3 Typical Zener Breakdown Characteristics

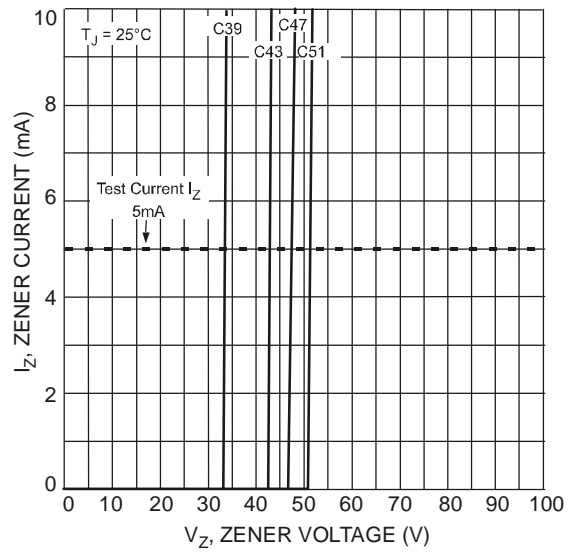


Fig. 4 Typical Zener Breakdown Characteristics

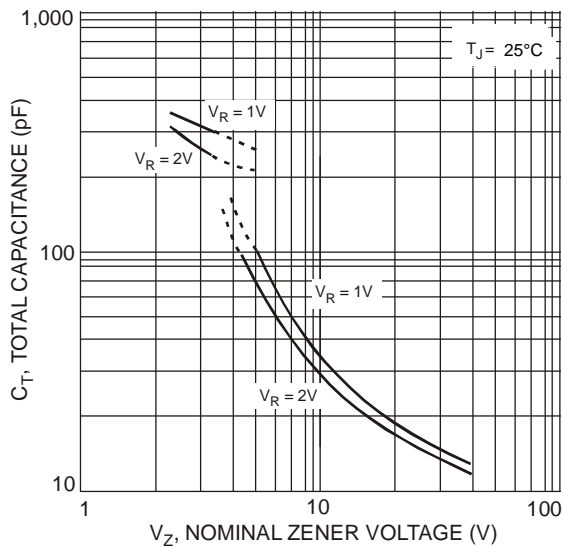
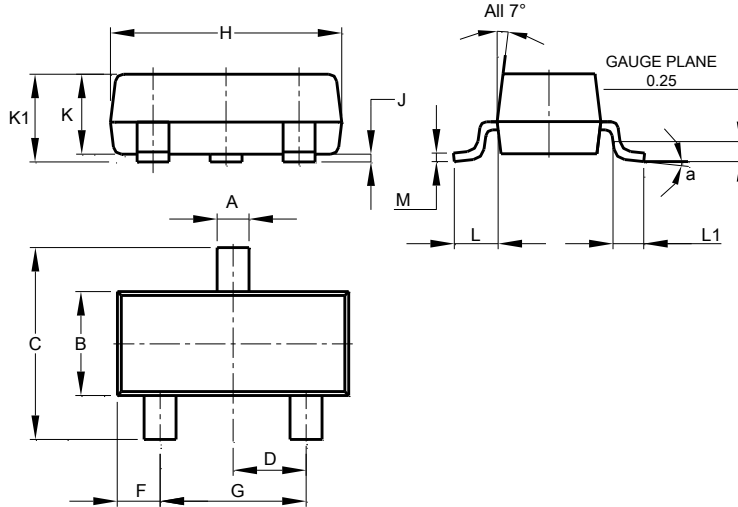


Fig. 5 Typical Total Capacitance vs. Nominal Zener Voltage

Package Outline Dimensions

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

SOT23

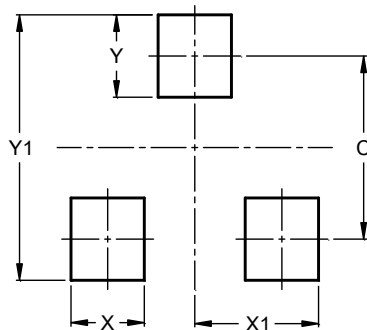


| SOT23 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 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 | | | |

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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