

## Features

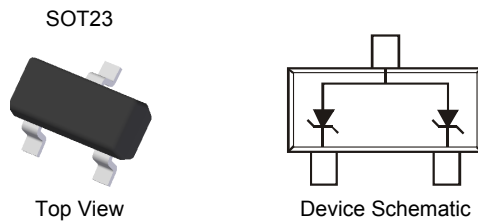
- Dual Zeners in Common Anode Configuration
- 300 mW Power Dissipation Rating
- Ideally Suited for Automated Insertion
- $\Delta V_Z$  For Both Diodes in One Case is  $\leq 5\%$
- Common Cathode Style Available See DZ Series
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and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

## 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 ②
- Polarity: See Diagram
- Approximate Weight: 0.008 grams



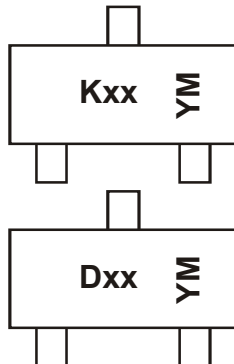
## Ordering Information (Note 5)

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

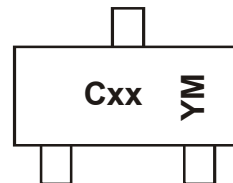
\*Add "-7-F" to the appropriate type number in Electrical Characteristics Table on Page 2 example: 6.2V Zener = AZ23C6V2-7F

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See <http://www.diodes.com> 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. Product manufactured with Date Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.
  5. For Packaging Details, go to our website at <http://www.diodes.com>.

## 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: Z = 2012)  
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: Z = 2012)  
M = Month (ex: 9 = September)

### Date Code Key

| Year | 1998 | ... | 2002 | 2003 | 2004 | ... | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|
| Code | J    | ... | N    | P    | R    | ... | X    | Y    | Z    | A    | B    | C    | D    | E    | F    |

| 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         | °C/W |
| Operating and Storage Temperature Range              | $T_J, T_{STG}$  | -65 to +150 | °C   |

Notes: 6. Mounted on FR4 PC Board with recommended pad layout which can be found on our website at <http://www.diodes.com>.

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

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

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

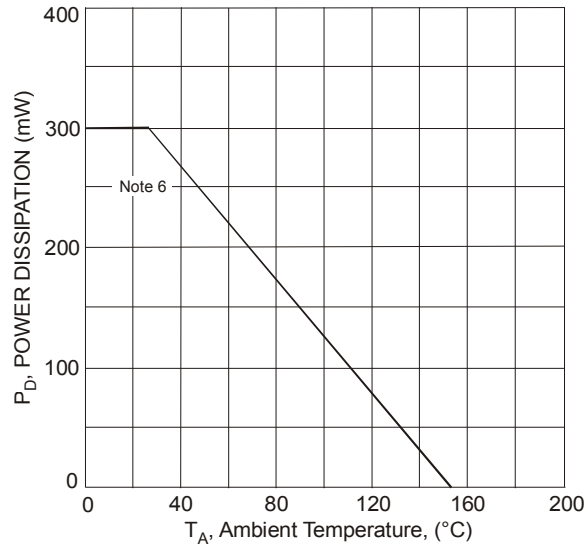


Fig. 1 Power Derating Curve

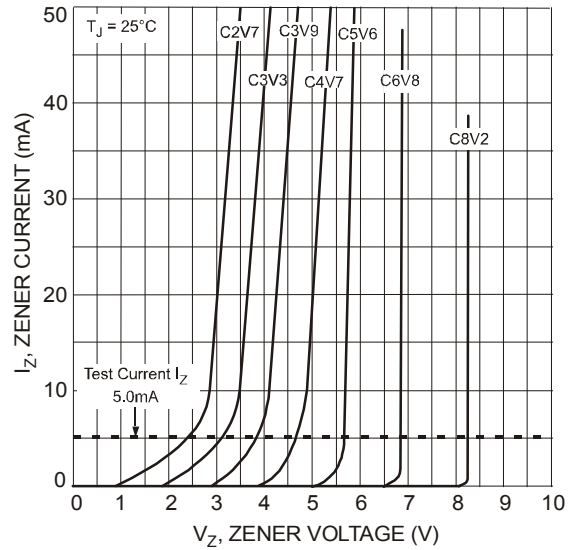


Fig. 2 Typical Zener Breakdown Characteristics

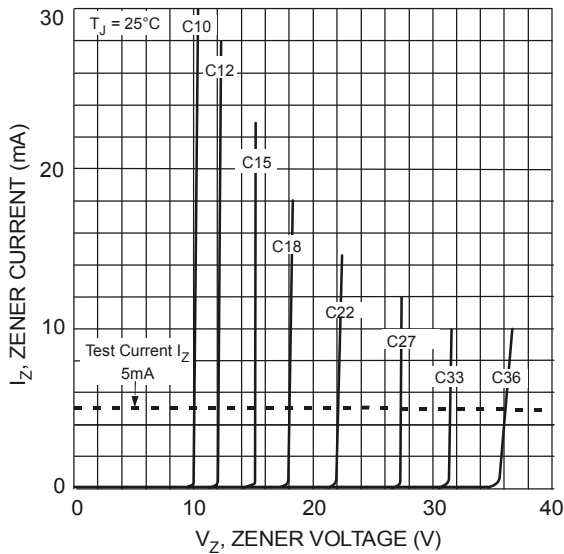


Fig. 3 Typical Zener Breakdown Characteristics

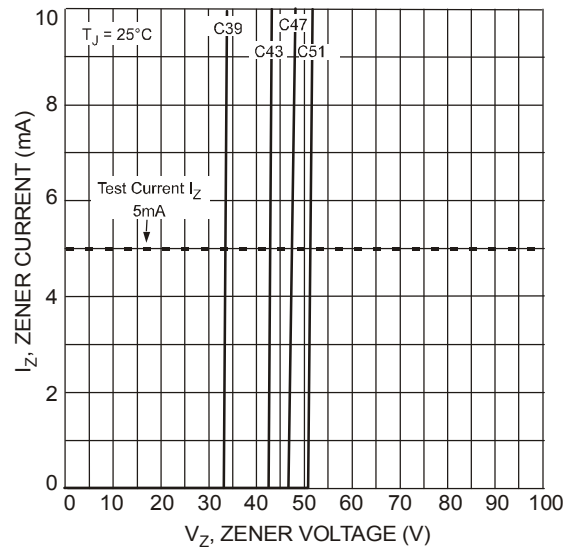


Fig. 4 Typical Zener Breakdown Characteristics

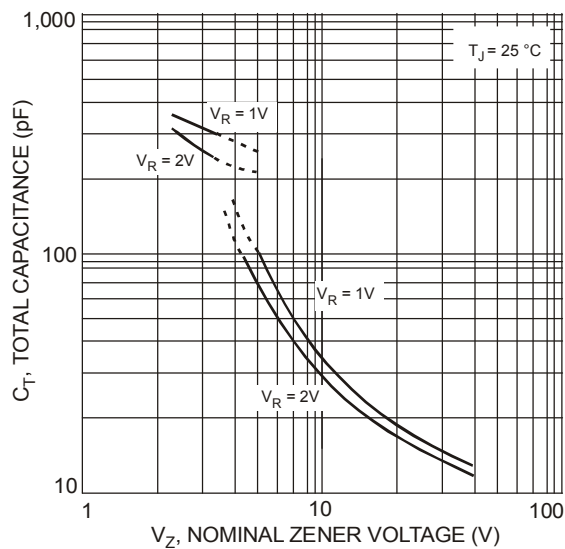
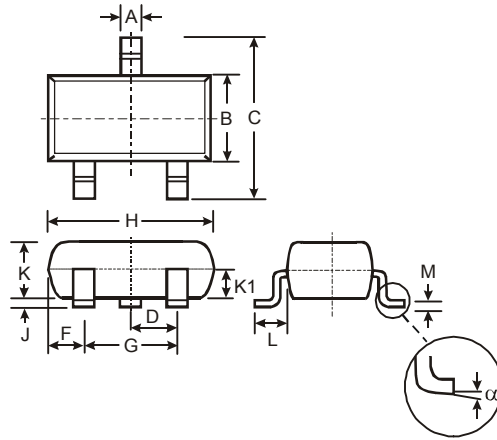


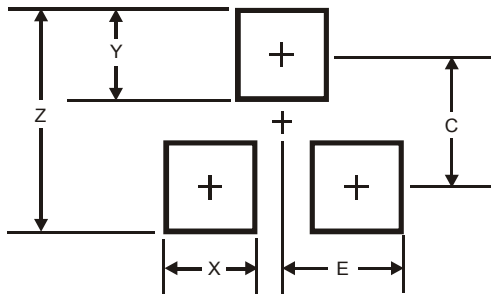
Fig. 5 Typical Total Capacitance vs. Nominal Zener Voltage

## Package Outline Dimensions



| 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                    | 0.903 | 1.10 | 1.00  |
| K1                   | -     | -    | 0.400 |
| L                    | 0.45  | 0.61 | 0.55  |
| M                    | 0.085 | 0.18 | 0.11  |
| $\alpha$             | 0°    | 8°   | -     |
| All Dimensions in mm |       |      |       |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.9           |
| X          | 0.8           |
| Y          | 0.9           |
| C          | 2.0           |
| E          | 1.35          |

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