

## Features

- Very Sharp Breakdown Characteristics
- 300mW Power Dissipation on FR-4 PCB
- Very Tight Tolerance on  $V_Z$
- Ideally Suited for Automated Assembly Processes
- Very Low Leakage Current
- **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**

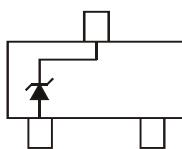
## Mechanical Data

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

SOT23



Top View



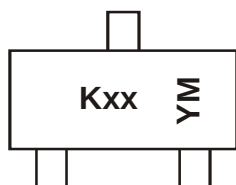
Device Schematic

## Ordering Information (Note 5)

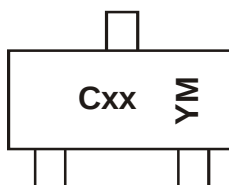
| Part Number               | Case  | Packaging          |
|---------------------------|-------|--------------------|
| (Type Number)-7 (Note 6)  | SOT23 | 3,000/Tape & Reel  |
| (Type Number)-13 (Note 7) | SOT23 | 10,000/Tape & Reel |

- 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 OW (week 42, 2009) and newer are built with Green Molding Compound. Product manufactured prior to Date Code OW are built with Non-Green Molding Compound and may contain Halogens or  $Sb_2O_3$  Fire Retardants.
  5. For Packaging Details, go to our website at <http://www.diodes.com>.
  6. Add "-7" to the appropriate type number in Electrical Characteristics Table. Example: 6.2V Zener = DDZX6V2B-7.
  7. Add "-13" to the appropriate type number in Electrical Characteristics Table. Example: 10V Zener = DDZX10C-13. Please note: Not all voltages are available in 13" reel size. Please contact the Diodes Inc. Sales Department for assistance in ordering 13" reel size devices.

## Marking Information



K = 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 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | T    | U    | V    | W    | X    | Y    | Z    | A    | B    | C    | D    | E    |

| 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   |

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                          | Symbol         | Value | Unit |
|-----------------------------------------|----------------|-------|------|
| Forward Voltage @ I <sub>F</sub> = 10mA | V <sub>F</sub> | 0.9   | V    |

**Thermal Characteristics**

| Characteristic                                       | Symbol                            | Value       | Unit |
|------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 8)                           | P <sub>D</sub>                    | 300         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 8) | R <sub>θJA</sub>                  | 417         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

Notes: 8. Device mounted on FR-4 PCB with recommended pad layout, which can be found on our website at <http://www.diodes.com>.

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

| Type Number | Marking Code | Zener Voltage Range<br>(Notes 9 & 10) |         |                 | Maximum Zener Impedance<br>f = 1kHz |                                   |                 | Maximum Reverse<br>Current (Note 11) |                  |
|-------------|--------------|---------------------------------------|---------|-----------------|-------------------------------------|-----------------------------------|-----------------|--------------------------------------|------------------|
|             |              | V <sub>Z</sub> @ I <sub>ZT</sub>      |         | I <sub>ZT</sub> | Z <sub>ZT</sub> @ I <sub>ZT</sub>   | Z <sub>ZK</sub> @ I <sub>ZK</sub> | I <sub>ZK</sub> | I <sub>R</sub>                       | @ V <sub>R</sub> |
|             |              | Min (V)                               | Max (V) | mA              | Ω                                   | Ω                                 | mA              | μA                                   | V                |
| DDZX5V1B    | KM           | 4.94                                  | 5.20    | 20              | 17                                  | 480                               | 1               | 5                                    | 1.5              |
| DDZX5V6B    | KN           | 5.45                                  | 5.73    | 20              | 11                                  | 400                               | 1               | 0.5                                  | 2.5              |
| DDZX6V2B    | KO           | 5.96                                  | 6.27    | 20              | 7                                   | 150                               | 1               | 0.5                                  | 4.0              |
| DDZX6V8C    | YP           | 6.66                                  | 7.01    | 20              | 5                                   | 150                               | 0.5             | 0.1                                  | 5.0              |
| DDZX7V5C    | YQ           | 7.29                                  | 7.67    | 20              | 6                                   | 120                               | 0.5             | 0.1                                  | 6.0              |
| DDZX8V2C    | YR           | 8.03                                  | 8.45    | 20              | 8                                   | 120                               | 0.5             | 0.1                                  | 6.5              |
| DDZX9V1C    | YS           | 8.83                                  | 9.30    | 20              | 8                                   | 120                               | 0.5             | 0.1                                  | 7.0              |
| DDZX10C     | YT           | 9.70                                  | 10.20   | 20              | 8                                   | 120                               | 0.5             | 0.1                                  | 8.0              |
| DDZX11C     | YU           | 10.82                                 | 11.38   | 10              | 10                                  | 120                               | 0.5             | 0.1                                  | 8.4              |
| DDZX12C     | YV           | 11.74                                 | 12.35   | 10              | 12                                  | 110                               | 0.5             | 0.1                                  | 9.1              |
| DDZX13B     | KW           | 12.55                                 | 13.21   | 10              | 14                                  | 110                               | 0.5             | 0.1                                  | 10.0             |
| DDZX14      | GX           | 13.65                                 | 14.35   | 10              | 16                                  | 110                               | 0.5             | 0.05                                 | 11.0             |
| DDZX15      | GY           | 14.80                                 | 15.57   | 10              | 18                                  | 150                               | 0.5             | 0.05                                 | 12.0             |
| DDZX16      | YY           | 15.69                                 | 16.51   | 10              | 18                                  | 150                               | 0.5             | 0.05                                 | 12.0             |
| DDZX18C     | YZ           | 17.42                                 | 18.33   | 10              | 23                                  | 150                               | 0.5             | 0.05                                 | 14.0             |
| DDZX20C     | PJ           | 19.23                                 | 20.22   | 10              | 28                                  | 200                               | 0.5             | 0.05                                 | 15.0             |
| DDZX22D     | 2K           | 21.52                                 | 22.63   | 5               | 30                                  | 200                               | 0.5             | 0.05                                 | 17.0             |
| DDZX24C     | PL           | 23.12                                 | 24.31   | 5               | 35                                  | 200                               | 0.5             | 0.05                                 | 19.0             |
| DDZX26      | ZM           | 24.97                                 | 26.26   | 5               | 45                                  | 250                               | 0.5             | 0.05                                 | 21.0             |
| DDZX27D     | 2M           | 26.29                                 | 27.64   | 5               | 45                                  | 250                               | 0.5             | 0.05                                 | 21.0             |
| DDZX30D     | 2N           | 29.02                                 | 30.51   | 5               | 55                                  | 250                               | 0.5             | 0.05                                 | 23.0             |
| DDZX33      | RP           | 32.14                                 | 33.79   | 5               | 75                                  | 250                               | 0.5             | 0.05                                 | 27.0             |
| DDZX36      | ZQ           | 35.36                                 | 37.19   | 5               | 85                                  | 250                               | 0.5             | 0.05                                 | 30.0             |
| DDZX39F     | 5Q           | 38.02                                 | 39.98   | 5               | 85                                  | 250                               | 0.5             | 0.05                                 | 30.0             |
| DDZX43      | ZR           | 42.14                                 | 43.86   | 5               | 90                                  | —                                 | —               | 0.05                                 | 33.0             |

Notes: 9. The Zener voltage is measured 40ms after power is supplied.  
10. For inquiries on tighter tolerances, or alternate nominal zener voltages, please contact your Diodes Inc. sales representative for availability and minimum order details.  
11. Short duration pulse test used to minimize self-heating effect.

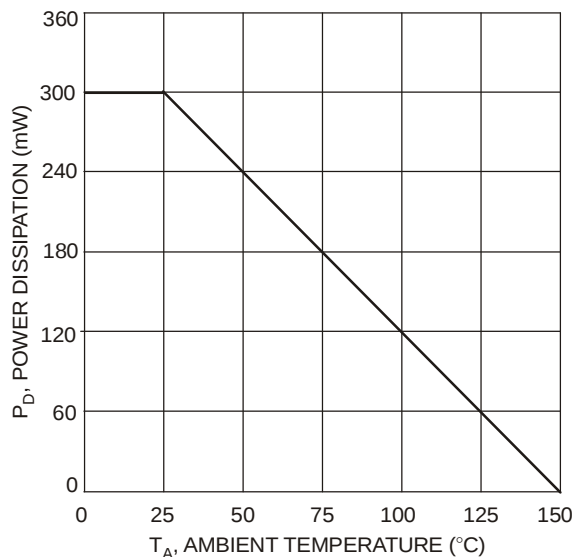


Fig. 1 Power Derating Curve

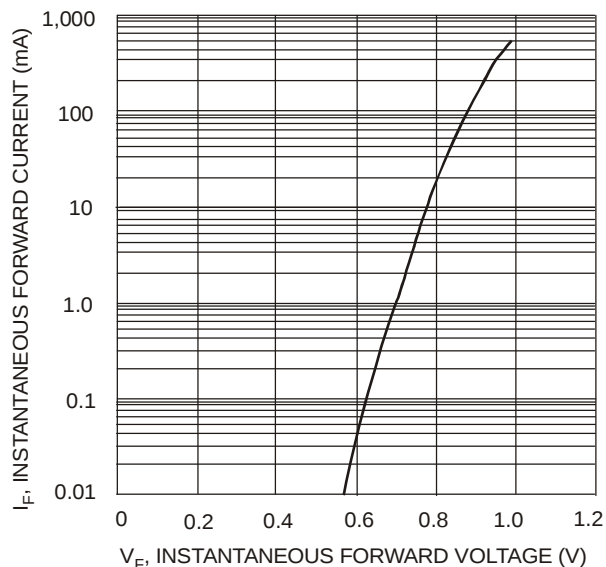


Fig. 2 Typical Forward Characteristics

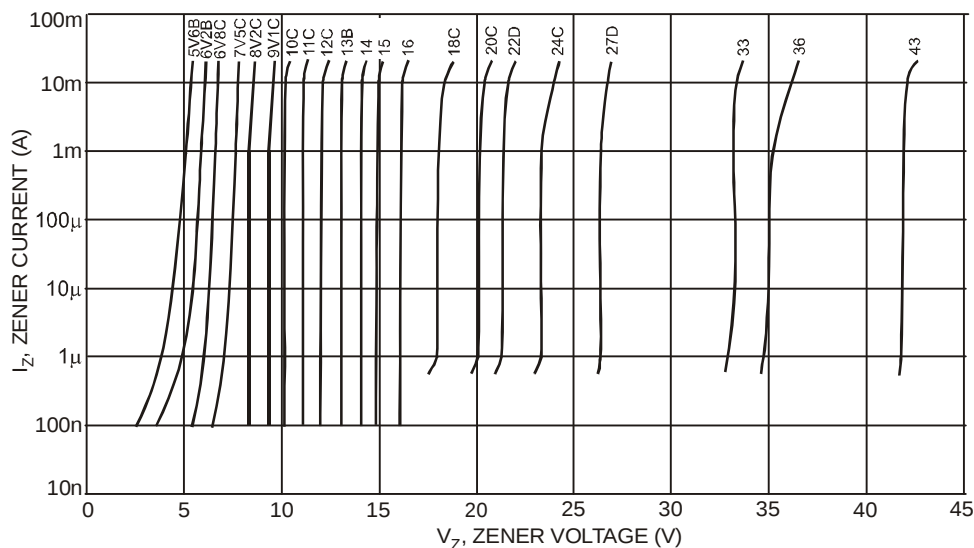


Fig. 3 Typical Zener Breakdown Characteristics

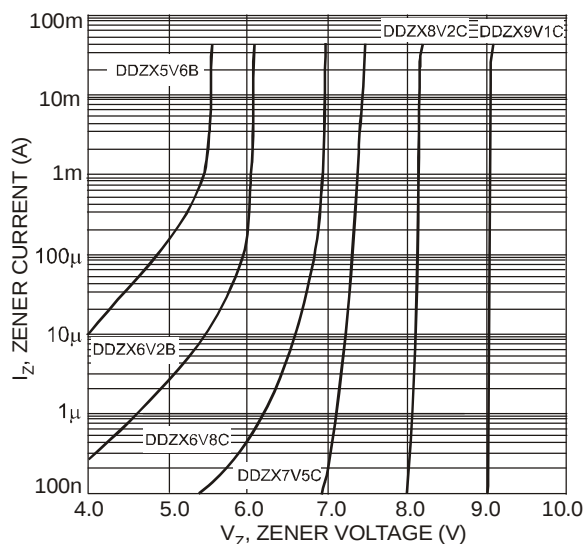


Fig. 4 Typical Zener Breakdown Characteristics  
DDZX5V6B - DDZX9V1C

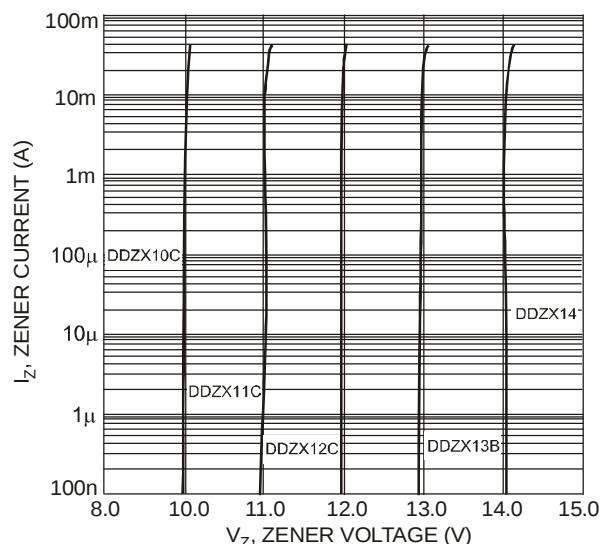


Fig. 5 Typical Zener Breakdown Characteristics  
DDZX10C - DDZX14

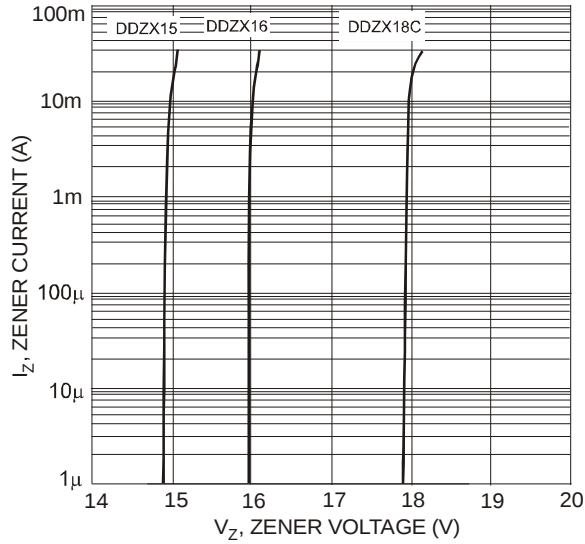


Fig. 6 Typical Zener Breakdown Characteristics  
DDZX15 - DDZX18C

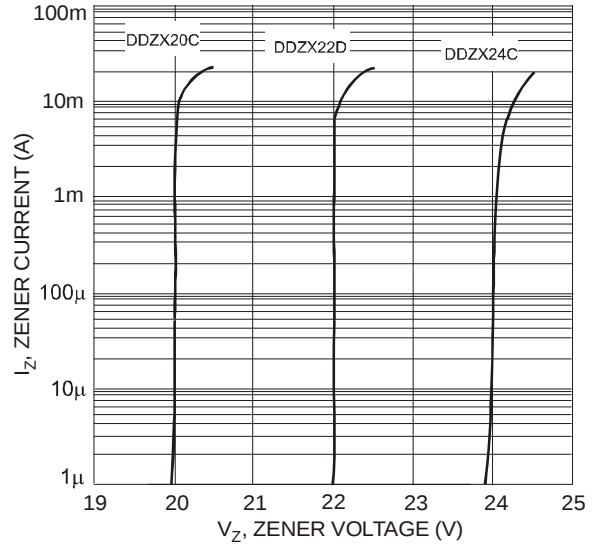


Fig. 7 Typical Zener Breakdown Characteristics  
DDZX20C - DDZX24C

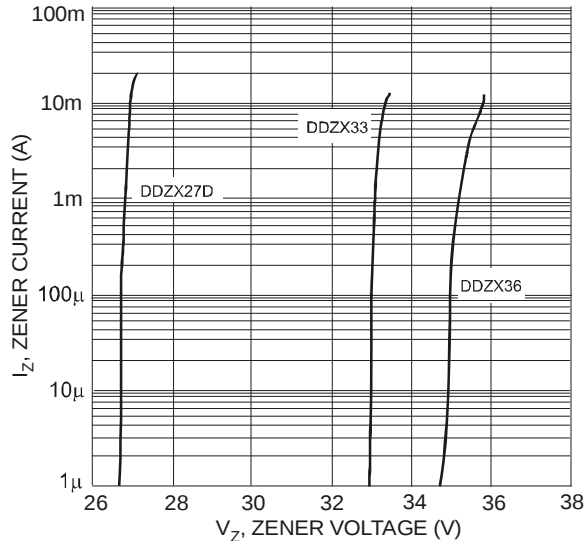


Fig. 8 Typical Zener Breakdown Characteristics  
DDZX27D - DDZX36

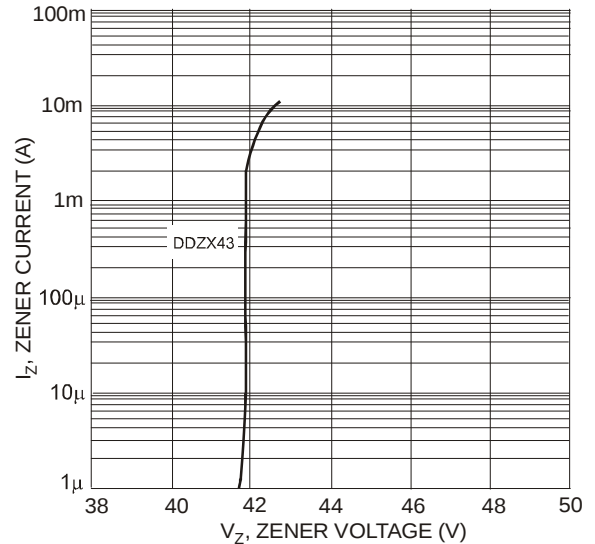


Fig. 9 Typical Zener Breakdown Characteristics, DDZX43

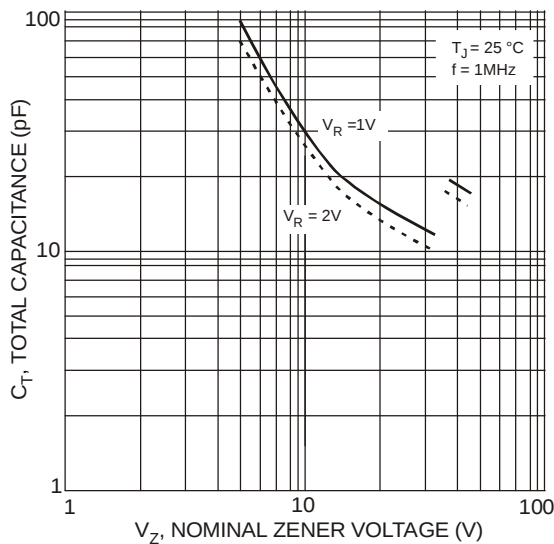


Fig. 10 Typical Total Capacitance  
vs. Nominal Zener Voltage

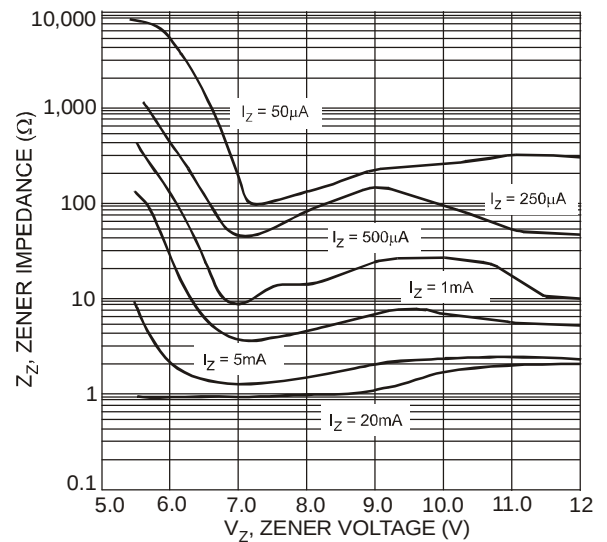


Fig. 11 Typical Zener Impedance Characteristics,  
DDZX5V6B - DDZX12C

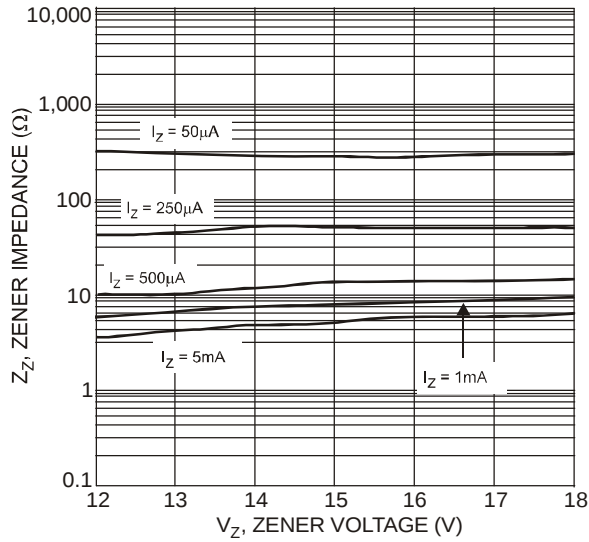


Fig. 12 Typical Zener Impedance Characteristics, DDZX12C - DDZX18C

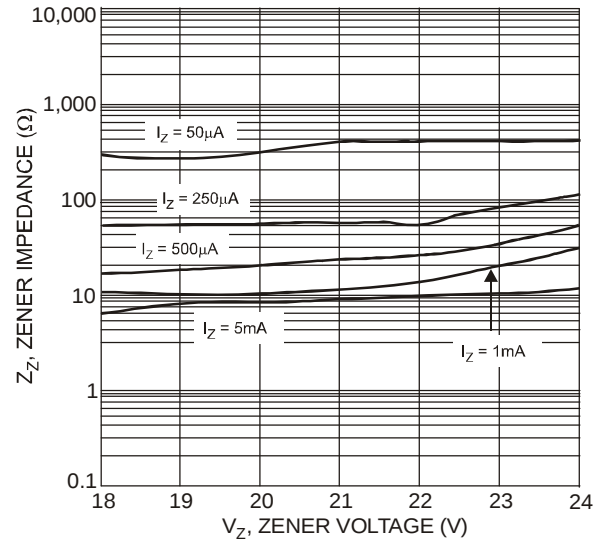


Fig. 13 Typical Zener Impedance Characteristics, DDZX18C - DDZX24C

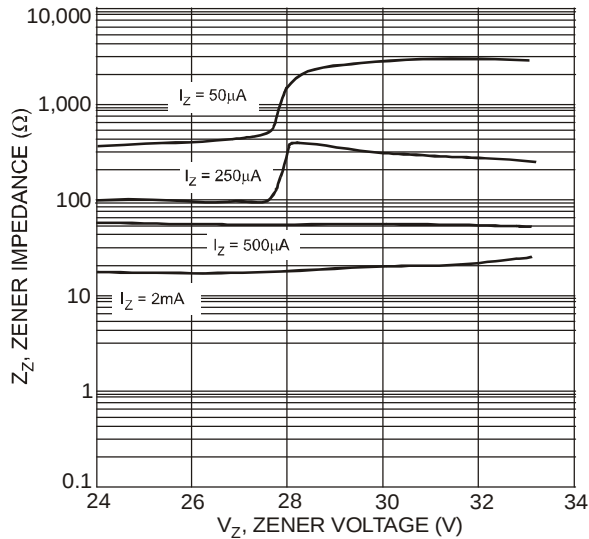


Fig. 14 Typical Zener Impedance Characteristics, DDZX24C - DDZX33

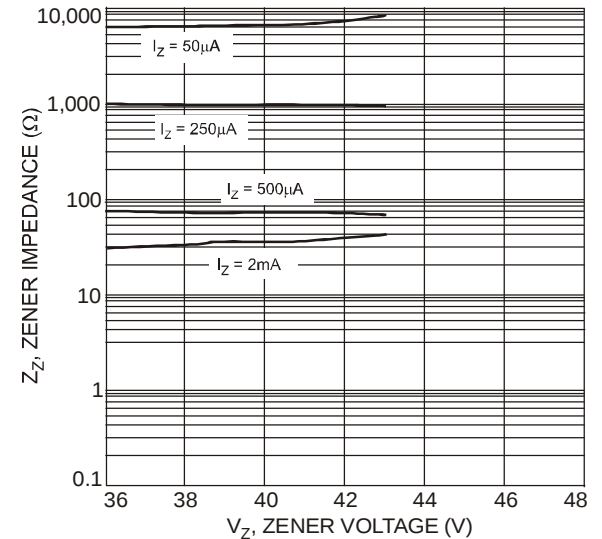


Fig. 15 Typical Zener Impedance Characteristics, DDZX36 - DDZX43

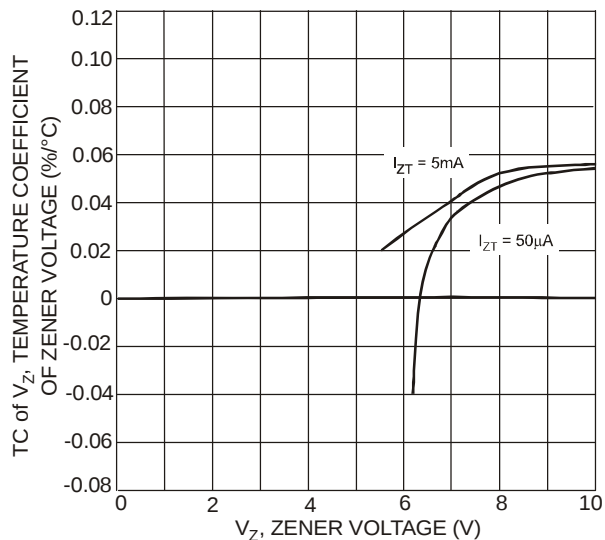


Fig. 16 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZX6V2B-DDZX10C

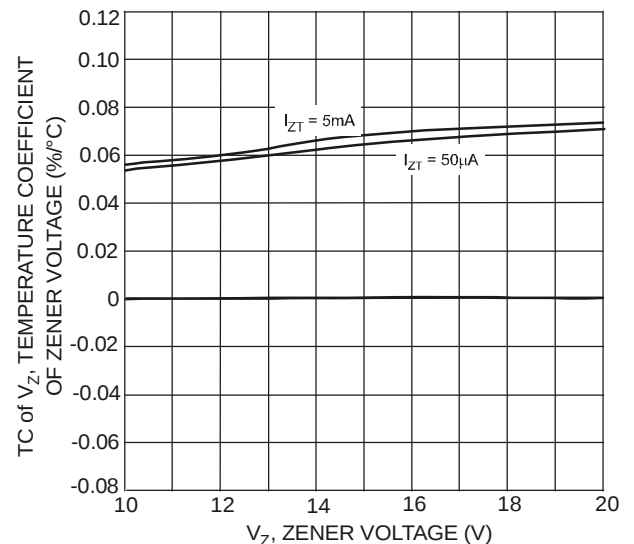


Fig. 17 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZX10C-DDZX20C

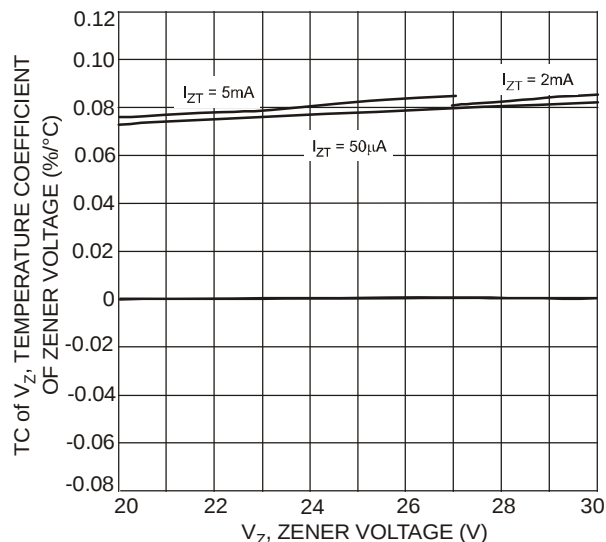


Fig. 18 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZX20C-DDZX30D

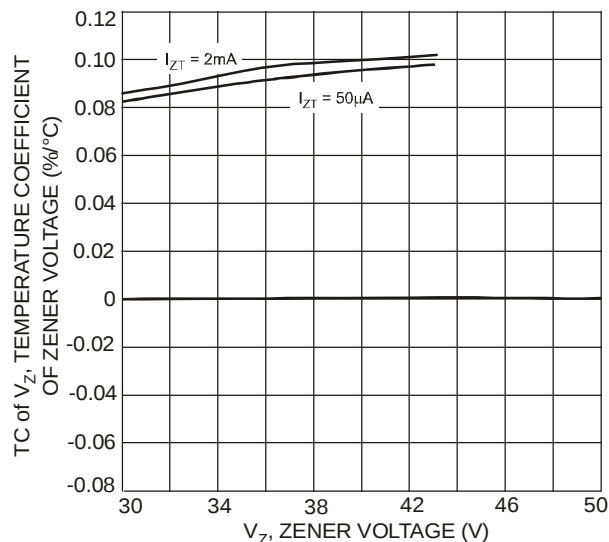
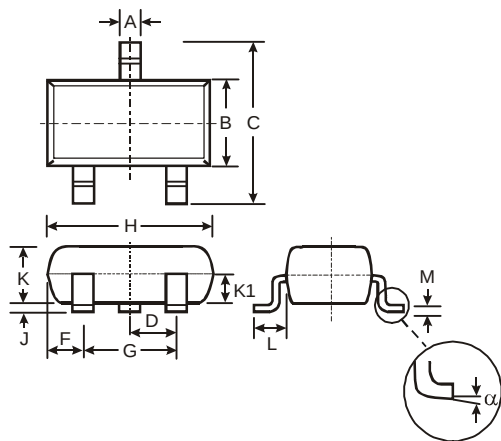


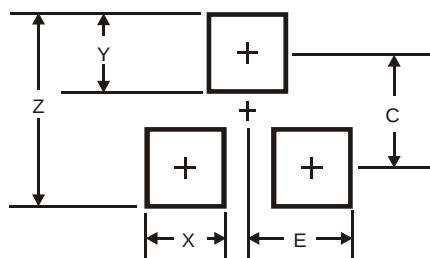
Fig. 19 Typical Temperature Coefficient of Zener Voltage vs. Zener Voltage, DDZX30D-DDZX43

## 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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