

## Features

- 500mW Power Dissipation on FR-4 PCB
- Very Tight Tolerance on  $V_z$
- Ideally Suited for Automated Assembly Processes
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: SOD323F
- Case Material: Molded Plastic, "Green Molding Compound".  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Cathode Band
- Terminals: Finish – Matte Tin Annealed over Copper Alloy  
Leadframe. Solderable per MIL-STD-202, Method 208 Ⓔ
- Weight: 0.004 grams (Approximate)

**SOD323F**


Top View

## Ordering Information (Note 4)

| Part Number   | Compliance | Case    | Packaging         |
|---------------|------------|---------|-------------------|
| DDZxx(x)SF-7* | Commercial | SOD323F | 3,000/Tape & Reel |

\*Add "-7" to the appropriate type number in Electrical Characteristics Table on Page 2. Example: DDZ10BSF-7.

- 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/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

## Marking Information



XX = Product Type Marking Code  
(See Electrical Characteristics Table)  
YM = Date Code Marking  
Y = Year (ex: D = 2016)  
M = Month (ex: 9 = September)

### Date Code Key

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | X    | Y    | Z    | A    | B    | C    | D    | E    | F    | G    | H    |

| 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 5)                           | P <sub>D</sub>                    | 500         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 5) | R <sub>θJA</sub>                  | 250         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Type Number | Marking Code | Zener Voltage Range<br>(Note 6)  |         |                                   | Maximum Zener Impedance<br>f = 1kHz | Maximum Reverse Current<br>(Note 7) |                  |
|-------------|--------------|----------------------------------|---------|-----------------------------------|-------------------------------------|-------------------------------------|------------------|
|             |              | V <sub>Z</sub> @ I <sub>ZT</sub> |         | Z <sub>zT</sub> @ I <sub>ZT</sub> |                                     | I <sub>R</sub>                      | @ V <sub>R</sub> |
|             |              | Min (V)                          | Max (V) | I <sub>ZT</sub><br>mA             | Ω                                   | μA                                  | V                |
| DDZ2V4ASF   | 4C           | 2.33                             | 2.52    | 20                                | 100                                 | 120                                 | 1                |
| DDZ2V4BSF   | KD           | 2.43                             | 2.63    | 20                                | 100                                 | 120                                 | 1                |
| DDZ2V7ASF   | 4E           | 2.54                             | 2.75    | 20                                | 110                                 | 120                                 | 1                |
| DDZ2V7BSF   | KE           | 2.69                             | 2.91    | 20                                | 110                                 | 120                                 | 1                |
| DDZ3V0ASF   | 4F           | 2.85                             | 3.07    | 20                                | 120                                 | 50                                  | 1                |
| DDZ3V0BSF   | KF           | 3.01                             | 3.22    | 20                                | 120                                 | 50                                  | 1                |
| DDZ3V3ASF   | 4G           | 3.16                             | 3.38    | 20                                | 130                                 | 20                                  | 1                |
| DDZ3V3BSF   | KG           | 3.32                             | 3.53    | 20                                | 130                                 | 20                                  | 1                |
| DDZ3V6ASF   | 4H           | 3.45                             | 3.69    | 20                                | 130                                 | 10                                  | 1                |
| DDZ3V6BSF   | KH           | 3.60                             | 3.84    | 20                                | 130                                 | 10                                  | 1                |
| DDZ3V9ASF   | 4J           | 3.74                             | 4.01    | 20                                | 130                                 | 10                                  | 1                |
| DDZ3V9BSF   | KJ           | 3.89                             | 4.16    | 20                                | 130                                 | 10                                  | 1                |
| DDZ4V3ASF   | 4K           | 4.04                             | 4.29    | 20                                | 130                                 | 10                                  | 1                |
| DDZ4V3BSF   | KK           | 4.17                             | 4.43    | 20                                | 130                                 | 10                                  | 1                |
| DDZ4V3CSF   | YK           | 4.30                             | 4.57    | 20                                | 130                                 | 10                                  | 1                |
| DDZ4V7ASF   | 4L           | 4.44                             | 4.68    | 20                                | 130                                 | 10                                  | 1                |
| DDZ4V7BSF   | KL           | 4.55                             | 4.80    | 20                                | 130                                 | 10                                  | 1                |
| DDZ4V7CSF   | YL           | 4.68                             | 4.93    | 20                                | 130                                 | 10                                  | 1                |
| DDZ5V1ASF   | 4M           | 4.81                             | 5.07    | 20                                | 130                                 | 7.5                                 | 2                |
| DDZ5V1BSF   | KM           | 4.94                             | 5.20    | 20                                | 130                                 | 7.5                                 | 2                |
| DDZ5V1CSF   | YM           | 5.09                             | 5.37    | 20                                | 130                                 | 7.5                                 | 2                |
| DDZ5V6ASF   | 4N           | 5.28                             | 5.55    | 20                                | 80                                  | 7.5                                 | 2                |
| DDZ5V6BSF   | KN           | 5.45                             | 5.73    | 20                                | 80                                  | 7.5                                 | 2                |
| DDZ5V6CSF   | YN           | 5.61                             | 5.91    | 20                                | 80                                  | 7.5                                 | 2                |
| DDZ6V2ASF   | 4O           | 5.78                             | 6.09    | 20                                | 50                                  | 7.5                                 | 3                |
| DDZ6V2BSF   | KO           | 5.96                             | 6.27    | 20                                | 50                                  | 7.5                                 | 3                |
| DDZ6V2CSF   | YO           | 6.12                             | 6.44    | 20                                | 50                                  | 7.5                                 | 3                |
| DDZ6V8ASF   | 4P           | 6.29                             | 6.63    | 20                                | 30                                  | 7.5                                 | 4                |
| DDZ6V8BSF   | KP           | 6.49                             | 6.83    | 20                                | 30                                  | 7.5                                 | 4                |
| DDZ6V8CSF   | YP           | 6.66                             | 7.01    | 20                                | 30                                  | 7.5                                 | 4                |
| DDZ7V5ASF   | 4Q           | 6.85                             | 7.22    | 20                                | 30                                  | 7.5                                 | 4                |
| DDZ7V5BSF   | KQ           | 7.07                             | 7.45    | 20                                | 30                                  | 7.5                                 | 4                |
| DDZ7V5CSF   | YQ           | 7.29                             | 7.67    | 20                                | 30                                  | 7.5                                 | 4                |
| DDZ8V2ASF   | 4R           | 7.53                             | 7.92    | 20                                | 30                                  | 7.5                                 | 7.15             |
| DDZ8V2BSF   | KR           | 7.78                             | 8.19    | 20                                | 30                                  | 7.5                                 | 7.39             |
| DDZ8V2CSF   | YR           | 8.03                             | 8.45    | 20                                | 30                                  | 7.5                                 | 7.63             |

- Notes:
- Device mounted on FR-4 PCB with 10mm x 10mm pad, board size 35mm x 25mm.
  - The Zener voltage is measured <40ms after power is supplied.
  - Short duration pulse test used to minimize self-heating effect.

**Electrical Characteristics** (Cont.) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Type Number | Marking Code | Zener Voltage Range<br>(Note 6)  |         |                       | Maximum Zener Impedance<br>f = 1kHz    | Maximum Reverse Current<br>(Note 7) |       |
|-------------|--------------|----------------------------------|---------|-----------------------|--|-------------------------------------|-------|
|             |              | V <sub>Z</sub> @ I <sub>ZT</sub> |         | I <sub>R</sub>        |  | @ V <sub>R</sub>                    |       |
|             |              | Min (V)                          | Max (V) | I <sub>ZT</sub><br>mA | Z <sub>ZT</sub> @ I <sub>ZT</sub><br>Ω | μA                                  | V     |
| DDZ9V1ASF   | 4S           | 8.29                             | 8.73    | 20                    | 30                                     | 7.5                                 | 7.88  |
| DDZ9V1BSF   | KS           | 8.57                             | 9.01    | 20                    | 30                                     | 7.5                                 | 8.14  |
| DDZ9V1CSF   | YS           | 8.83                             | 9.30    | 20                    | 30                                     | 7.5                                 | 8.39  |
| DDZ10ASF    | 4T           | 9.12                             | 9.59    | 20                    | 30                                     | 7.5                                 | 8.66  |
| DDZ10BSF    | KT           | 9.41                             | 9.90    | 20                    | 30                                     | 7.5                                 | 8.94  |
| DDZ10CSF    | YT           | 9.70                             | 10.20   | 20                    | 30                                     | 7.5                                 | 9.22  |
| DDZ10DSF    | 7T           | 9.94                             | 10.44   | 20                    | 30                                     | 7.5                                 | 9.44  |
| DDZ11ASF    | 4U           | 10.18                            | 10.71   | 10                    | 30                                     | 0.07                                | 9.67  |
| DDZ11BSF    | KU           | 10.50                            | 11.05   | 10                    | 30                                     | 0.07                                | 9.98  |
| DDZ11CSF    | YU           | 10.82                            | 11.38   | 10                    | 30                                     | 0.07                                | 10.28 |
| DDZ12ASF    | 4V           | 11.13                            | 11.71   | 10                    | 35                                     | 0.07                                | 10.60 |
| DDZ12BSF    | KV           | 11.44                            | 12.03   | 10                    | 30                                     | 0.07                                | 10.90 |
| DDZ12CSF    | YV           | 11.74                            | 12.35   | 10                    | 35                                     | 0.07                                | 11.20 |
| DDZ13ASF    | 4W           | 12.11                            | 12.75   | 10                    | 35                                     | 0.07                                | 11.50 |
| DDZ13BSF    | KW           | 12.55                            | 13.21   | 10                    | 35                                     | 0.07                                | 11.90 |
| DDZ13CSF    | YW           | 12.99                            | 13.66   | 10                    | 35                                     | 0.07                                | 12.30 |
| DDZ15ASF    | 4X           | 13.44                            | 14.13   | 10                    | 40                                     | 0.07                                | 12.80 |
| DDZ15BSF    | KX           | 13.89                            | 14.62   | 10                    | 40                                     | 0.07                                | 13.20 |
| DDZ15CSF    | YX           | 14.35                            | 15.09   | 10                    | 40                                     | 0.07                                | 13.60 |
| DDZ16ASF    | 4Y           | 14.80                            | 15.57   | 10                    | 40                                     | 0.07                                | 14.10 |
| DDZ16BSF    | KY           | 15.25                            | 16.04   | 10                    | 40                                     | 0.07                                | 14.50 |
| DDZ16CSF    | YY           | 15.69                            | 16.51   | 10                    | 40                                     | 0.07                                | 14.90 |
| DDZ18ASF    | 4Z           | 16.22                            | 17.06   | 10                    | 45                                     | 0.07                                | 15.40 |
| DDZ18BSF    | KZ           | 16.82                            | 17.70   | 10                    | 45                                     | 0.07                                | 16.00 |
| DDZ18CSF    | YZ           | 17.42                            | 18.33   | 10                    | 45                                     | 0.07                                | 16.50 |
| DDZ20ASF    | RJ           | 18.05                            | 18.96   | 10                    | 50                                     | 0.07                                | 17.10 |
| DDZ20BSF    | ZJ           | 18.63                            | 19.59   | 10                    | 50                                     | 0.07                                | 17.70 |
| DDZ20CSF    | PJ           | 19.23                            | 20.22   | 10                    | 50                                     | 0.07                                | 17.70 |
| DDZ20DSF    | 2J           | 19.72                            | 20.72   | 10                    | 50                                     | 0.07                                | 18.70 |
| DDZ22ASF    | RK           | 20.15                            | 21.20   | 5                     | 55                                     | 0.07                                | 19.10 |
| DDZ22BSF    | ZK           | 20.64                            | 21.71   | 5                     | 55                                     | 0.07                                | 19.60 |
| DDZ22CSF    | PK           | 21.08                            | 22.17   | 5                     | 55                                     | 0.07                                | 20.00 |
| DDZ22DSF    | 2K           | 21.52                            | 22.63   | 5                     | 55                                     | 0.07                                | 20.40 |
| DDZ24ASF    | RL           | 22.05                            | 23.18   | 5                     | 60                                     | 0.07                                | 20.90 |
| DDZ24BSF    | ZL           | 22.61                            | 23.77   | 5                     | 60                                     | 0.07                                | 21.50 |
| DDZ24CSF    | PL           | 23.12                            | 24.31   | 5                     | 60                                     | 0.07                                | 22.00 |
| DDZ24DSF    | 2L           | 23.63                            | 24.85   | 5                     | 60                                     | 0.07                                | 22.40 |
| DDZ27ASF    | RM           | 24.26                            | 25.52   | 5                     | 70                                     | 0.07                                | 23.00 |
| DDZ27BSF    | ZM           | 24.97                            | 26.26   | 5                     | 70                                     | 0.07                                | 23.70 |
| DDZ27CSF    | PM           | 25.63                            | 26.95   | 5                     | 70                                     | 0.07                                | 24.30 |
| DDZ27DSF    | 2M           | 26.29                            | 27.64   | 5                     | 70                                     | 0.07                                | 25.00 |
| DDZ30ASF    | RN           | 26.99                            | 28.39   | 5                     | 80                                     | 0.07                                | 25.60 |
| DDZ30BSF    | ZN           | 27.70                            | 29.13   | 5                     | 80                                     | 0.07                                | 26.00 |
| DDZ30CSF    | PN           | 28.36                            | 29.82   | 5                     | 55                                     | 0.07                                | 26.90 |
| DDZ30DSF    | 2N           | 29.02                            | 30.51   | 5                     | 80                                     | 0.07                                | 27.60 |
| DDZ33ASF    | RO           | 29.68                            | 31.22   | 5                     | 80                                     | 0.07                                | 28.20 |
| DDZ33BSF    | ZO           | 30.32                            | 31.88   | 5                     | 80                                     | 0.07                                | 28.80 |
| DDZ33CSF    | PO           | 30.90                            | 32.50   | 5                     | 65                                     | 0.07                                | 29.40 |
| DDZ33DSF    | 2O           | 31.49                            | 33.11   | 5                     | 65                                     | 0.07                                | 29.90 |
| DDZ36ASF    | RP           | 32.14                            | 33.79   | 5                     | 90                                     | 0.07                                | 30.50 |
| DDZ36BSF    | ZP           | 32.79                            | 34.49   | 5                     | 90                                     | 0.07                                | 31.20 |
| DDZ36CSF    | PP           | 33.40                            | 35.13   | 5                     | 75                                     | 0.07                                | 31.70 |
| DDZ36DSF    | 2P           | 34.01                            | 35.77   | 5                     | 90                                     | 0.07                                | 32.30 |
| DDZ39ASF    | RQ           | 34.68                            | 36.47   | 5                     | 85                                     | 0.2                                 | 30.00 |
| DDZ39BSF    | ZQ           | 35.36                            | 37.19   | 5                     | 85                                     | 0.2                                 | 30.00 |
| DDZ39CSF    | PQ           | 36.00                            | 37.85   | 5                     | 85                                     | 0.2                                 | 30.00 |
| DDZ39DSF    | 2Q           | 36.63                            | 38.52   | 5                     | 85                                     | 0.2                                 | 30.00 |

Notes: 6. The Zener voltage is measured <40ms after power is supplied.  
7. Short duration pulse test used to minimize self-heating effect.



Fig. 3 Temperature Coefficient vs. Zener Voltage



Fig. 4 Typical Zener Breakdown Characteristics

**Package Outline Dimensions**

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

SOD323F

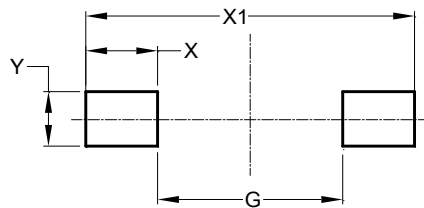


| SOD323F              |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.60 | 0.75 | –    |
| b                    | 0.25 | 0.35 | –    |
| c                    | 0.05 | 0.26 | –    |
| D                    | 1.15 | 1.35 | 1.25 |
| E                    | 1.60 | 1.80 | 1.70 |
| He                   | 2.30 | 2.70 | 2.50 |
| L1                   | 0.30 | 0.50 | 0.40 |
| L2                   | 0.41 | 0.61 | 0.51 |
| alpha1               | –    | –    | 7°   |
| alpha2               | –    | –    | 3°   |
| beta1                | –    | –    | 7°   |
| beta2                | –    | –    | 3°   |
| All Dimensions in mm |      |      |      |

**Suggested Pad Layout**

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

SOD323F



| Dimensions | Value (in mm) |
|------------|---------------|
| G          | 1.280         |
| X          | 0.710         |
| X1         | 2.700         |
| Y          | 0.403         |

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