

# Zener Voltage Regulators

## 200 mW SOD-323 Surface Mount

This series of Zener diodes is packaged in a SOD-323 surface mount package that has a power dissipation of 200 mW. They are designed to provide voltage regulation protection and are especially attractive in situations where space is at a premium. They are well suited for applications such as cellular phones, hand held portables, and high density PC boards.

### Specification Features:

- Standard Zener Breakdown Voltage Range – 2.0 V to 75 V
- Steady State Power Rating of 200 mW
- Small Body Outline Dimensions: 0.067" x 0.049"(1.7 mm x 1.25 mm)
- Low Body Height: 0.035" (0.9 mm)
- Package Weight: 4.507mg/unit
- ESD Rating of Class 3 per Human Body Model
- Pb-Free package is available.
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.
- We declare that the material of product compliance with RoHS requirements and Halogen Free.

### Mechanical Characteristics:

**CASE:** Void-free, transfer-molded plastic

**FINISH:** All external surfaces are corrosion resistant

### MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES:

260°C for 10 Seconds

**POLARITY:** Cathode indicated by polarity band

**FLAMMABILITY RATING:** UL94 V-0

**MOUNTING POSITION:** Any

### ORDERING INFORMATION

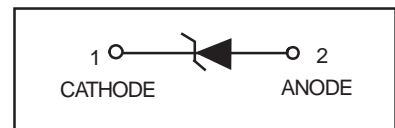
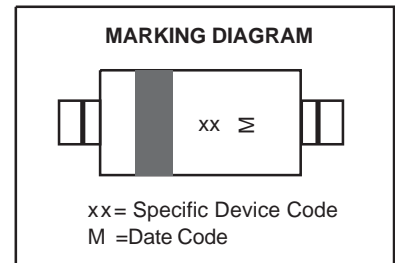
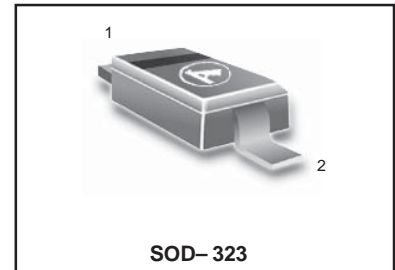
| Device            | Package | Shipping        |
|-------------------|---------|-----------------|
| LM3Z2V0T1G Series | SOD-323 | 3000/Tape&Reel  |
| LM3Z2V0T3G Series | SOD-323 | 10000/Tape&Reel |

### MAXIMUM RATINGS

| Rating   | Symbol          | Max        | Unit  |
|--|-----------------|------------|-------|
| Total Device Dissipation FR-5 Board(Note 1.) @ TA = 25°C | $P_D$           | 200        | mW    |
| Derate above 25°C  |                 | 1.5        | mW/°C |
| Thermal Resistance from Junction to Ambient              | $R_{\theta JA}$ | 635        | °C/W  |
| Junction and Storage Temperature Range                   | $T_J, T_{stg}$  | -65 to+150 | °C    |

1. FR-4 Minimum Pad

**LM3Z2V0T1G**  
**Series**  
**S-LM3Z2V0T1G**  
**Series**

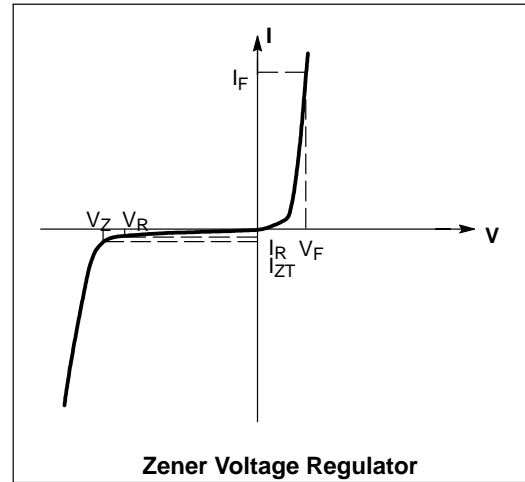


LM3Z2V0T1G Series, S-LM3Z2V0T1G Series

**ELECTRICAL CHARACTERISTICS**

( $T_A = 25^\circ\text{C}$  unless otherwise noted,  
 $V_F = 0.9\text{ V Max. @ } I_F = 10\text{ mA}$  for all types)

| Symbol        | Parameter   |
|---------------|---|
| $V_Z$         | Reverse Zener Voltage @ $I_{ZT}$                    |
| $I_{ZT}$      | Reverse Current                                     |
| $Z_{ZT}$      | Maximum Zener Impedance @ $I_{ZT}$                  |
| $I_{ZK}$      | Reverse Current                                     |
| $Z_{ZK}$      | Maximum Zener Impedance @ $I_{ZK}$                  |
| $I_R$         | Reverse Leakage Current @ $V_R$                     |
| $V_R$         | Reverse Voltage                                     |
| $I_F$         | Forward Current                                     |
| $V_F$         | Forward Voltage @ $I_F$                             |
| $\Theta_{VZ}$ | Maximum Temperature Coefficient of $V_Z$            |
| C             | Max. Capacitance @ $V_R = 0$ and $f = 1\text{ MHz}$ |



LM3Z2V0T1G Series, S-LM3Z2V0T1G Series

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted,  $V_F = 0.9\text{ V Max.}$  @  $I_F = 10\text{ mA}$  for all types)

| Device     | Device Marking | Zener Voltage (Note 2.) |       |      | Zener Impedance |                     |                     | Leakage Current |               | $\theta_{V_Z}$ (mV/k) @ $I_{ZT}$ |      | C @ $V_R = 0$ f = 1 MHz |     |
|------------|----------------|-------------------------|-------|------|-----------------|---------------------|---------------------|-----------------|---------------|----------------------------------|------|-------------------------|-----|
|            |                | $V_Z$ (Volts)           |       |      | $@ I_{ZT}$      | $Z_{ZT}$ @ $I_{ZT}$ | $Z_{ZK}$ @ $I_{ZK}$ |                 | $I_R$ @ $V_R$ |                                  | Min  |                         | Max |
|            |                | Min                     | Nom   | Max  | mA              | $\Omega$            | $\Omega$            | mA              | $\mu\text{A}$ | Volts                            | Min  | Max                     | pF  |
| LM3Z2V0T1G | WY             | 1.91                    | 2.0   | 2.09 | 5               | 100                 | 600                 | 1.0             | 150           | 1.0                              | -3.5 | 0                       | 450 |
| LM3Z2V4T1G | 00             | 2.2                     | 2.4   | 2.6  | 5               | 100                 | 1000                | 0.5             | 50            | 1.0                              | -3.5 | 0                       | 450 |
| LM3Z2V7T1G | 01             | 2.5                     | 2.7   | 2.9  | 5               | 100                 | 1000                | 0.5             | 20            | 1.0                              | -3.5 | 0                       | 450 |
| LM3Z3V0T1G | 02             | 2.8                     | 3.0   | 3.2  | 5               | 100                 | 1000                | 0.5             | 10            | 1.0                              | -3.5 | 0                       | 450 |
| LM3Z3V3T1G | 05             | 3.1                     | 3.3   | 3.5  | 5               | 95                  | 1000                | 0.5             | 5             | 1.0                              | -3.5 | 0                       | 450 |
| LM3Z3V6T1G | 06             | 3.4                     | 3.6   | 3.8  | 5               | 90                  | 1000                | 0.5             | 5             | 1.0                              | -3.5 | 0                       | 450 |
| LM3Z3V9T1G | 07             | 3.7                     | 3.9   | 4.1  | 5               | 90                  | 1000                | 0.5             | 3             | 1.0                              | -3.5 | -2.5                    | 450 |
| LM3Z4V3T1G | 08             | 4.0                     | 4.3   | 4.6  | 5               | 90                  | 1000                | 0.5             | 3             | 1.0                              | -3.5 | 0                       | 450 |
| LM3Z4V7T1G | 09             | 4.4                     | 4.7   | 5.0  | 5               | 80                  | 800                 | 0.5             | 3             | 2.0                              | -3.5 | 0.2                     | 260 |
| LM3Z5V1T1G | 0A             | 4.8                     | 5.1   | 5.4  | 5               | 60                  | 800                 | 0.5             | 2             | 2.0                              | -2.7 | 1.2                     | 225 |
| LM3Z5V6T1G | 0C             | 5.2                     | 5.6   | 6.0  | 5               | 40                  | 700                 | 0.5             | 1             | 2.0                              | -2.0 | 2.5                     | 200 |
| LM3Z6V2T1G | 0E             | 5.8                     | 6.2   | 6.6  | 5               | 10                  | 100                 | 0.5             | 3             | 4.0                              | 0.4  | 3.7                     | 185 |
| LM3Z6V8T1G | 0F             | 6.4                     | 6.8   | 7.2  | 5               | 15                  | 160                 | 0.5             | 2             | 4.0                              | 1.2  | 4.5                     | 155 |
| LM3Z7V5T1G | 0G             | 7.0                     | 7.5   | 7.9  | 5               | 15                  | 160                 | 0.5             | 1             | 5.0                              | 2.5  | 5.3                     | 140 |
| LM3Z8V2T1G | 0H             | 7.7                     | 8.2   | 8.7  | 5               | 15                  | 160                 | 0.5             | 0.7           | 5.0                              | 3.2  | 6.2                     | 135 |
| LM3Z9V1T1G | 0K             | 8.5                     | 9.1   | 9.6  | 5               | 15                  | 160                 | 0.5             | 0.2           | 7.0                              | 3.8  | 7.0                     | 130 |
| LM3Z10VT1G | 0L             | 9.4                     | 10    | 10.6 | 5               | 20                  | 160                 | 0.5             | 0.1           | 8.0                              | 4.5  | 8.0                     | 130 |
| LM3Z11VT1G | 0M             | 10.4                    | 11    | 11.6 | 5               | 20                  | 160                 | 0.5             | 0.1           | 8.0                              | 5.4  | 9.0                     | 130 |
| LM3Z12VT1G | 0N             | 11.4                    | 12    | 12.7 | 5               | 25                  | 80                  | 0.5             | 0.1           | 8.0                              | 6.0  | 10                      | 130 |
| LM3Z13VT1G | 0P             | 12.4                    | 13.25 | 14.1 | 5               | 30                  | 80                  | 0.5             | 0.1           | 8.0                              | 7.0  | 11                      | 120 |
| LM3Z15VT1G | 0T             | 14.3                    | 15    | 15.8 | 5               | 30                  | 400                 | 0.5             | 0.05          | 10.5                             | 9.2  | 13                      | 110 |
| LM3Z16VT1G | 0U             | 15.3                    | 16.2  | 17.1 | 5               | 40                  | 400                 | 0.5             | 0.05          | 11.2                             | 10.4 | 14                      | 105 |
| LM3Z18VT1G | 0W             | 16.8                    | 18    | 19.1 | 5               | 45                  | 400                 | 0.5             | 0.05          | 12.6                             | 12.4 | 16                      | 100 |
| LM3Z20VT1G | 0Z             | 18.8                    | 20    | 21.2 | 5               | 55                  | 500                 | 0.5             | 0.05          | 14.0                             | 14.4 | 18                      | 85  |
| LM3Z22VT1G | 10             | 20.8                    | 22    | 23.3 | 5               | 55                  | 500                 | 0.5             | 0.05          | 15.4                             | 16.4 | 20                      | 85  |
| LM3Z24VT1G | 11             | 22.8                    | 24.2  | 25.6 | 5               | 70                  | 120                 | 0.5             | 0.05          | 16.8                             | 18.4 | 22                      | 80  |
| LM3Z27VT1G | 12             | 25.1                    | 27    | 28.9 | 2               | 80                  | 300                 | 0.5             | 0.05          | 18.9                             | 21.4 | 25.3                    | 70  |
| LM3Z30VT1G | 14             | 28                      | 30    | 32   | 2               | 80                  | 300                 | 0.5             | 0.05          | 21.0                             | 24.4 | 29.4                    | 70  |
| LM3Z33VT1G | 18             | 31                      | 33    | 35   | 2               | 80                  | 300                 | 0.5             | 0.05          | 23.2                             | 27.4 | 33.4                    | 70  |
| LM3Z36VT1G | 19             | 34                      | 36    | 38   | 2               | 90                  | 500                 | 0.5             | 0.05          | 25.2                             | 30.4 | 37.4                    | 70  |
| LM3Z39VT1G | 20             | 37                      | 39    | 41   | 2               | 130                 | 500                 | 0.5             | 0.05          | 27.3                             | 33.4 | 41.2                    | 45  |
| LM3Z43VT1G | 21             | 40                      | 43    | 46   | 2               | 150                 | 500                 | 0.5             | 0.05          | 30.1                             | 37.6 | 46.6                    | 40  |
| LM3Z47VT1G | 1A             | 44                      | 47    | 50   | 2               | 170                 | 500                 | 0.5             | 0.05          | 32.9                             | 42.0 | 51.8                    | 40  |
| LM3Z51VT1G | 1C             | 48                      | 51    | 54   | 2               | 180                 | 500                 | 0.5             | 0.05          | 35.7                             | 46.6 | 57.2                    | 40  |
| LM3Z56VT1G | 1D             | 52                      | 56    | 60   | 2               | 200                 | 500                 | 0.5             | 0.05          | 39.2                             | 52.2 | 63.8                    | 40  |
| LM3Z62VT1G | 1E             | 58                      | 62    | 66   | 2               | 215                 | 500                 | 0.5             | 0.05          | 43.4                             | 58.8 | 71.6                    | 35  |
| LM3Z68VT1G | 1F             | 64                      | 68    | 72   | 2               | 240                 | 500                 | 0.5             | 0.05          | 47.6                             | 65.6 | 79.8                    | 35  |
| LM3Z75VT1G | 1G             | 70                      | 75    | 79   | 2               | 255                 | 500                 | 0.5             | 0.05          | 52.5                             | 73.4 | 88.6                    | 35  |

2. Zener voltage is measured with a pulse test current  $I_Z$  at an ambient temperature of  $25^\circ\text{C}$ .

LM3Z2V0T1G Series, S-LM3Z2V0T1G Series

Typical Characteristics

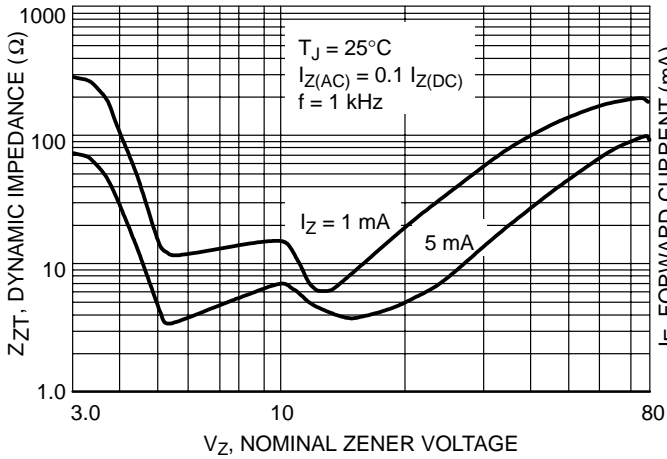


Figure 1. Effect of Zener Voltage on Zener Impedance

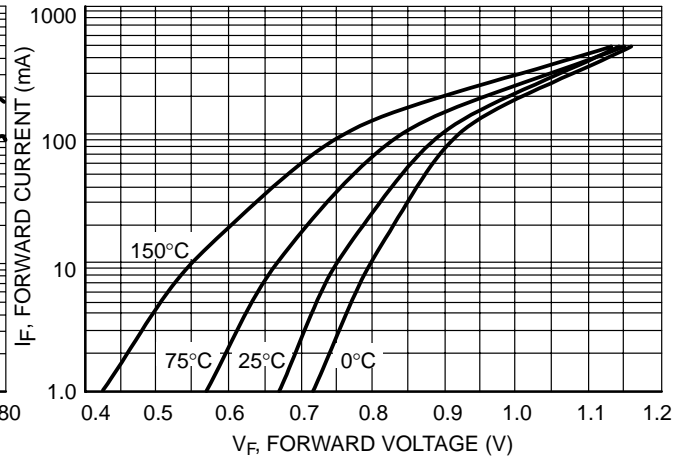


Figure 2. Typical Forward Voltage

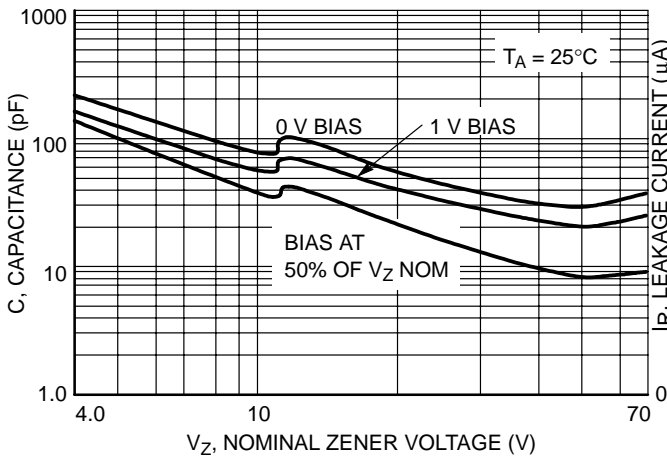


Figure 3. Typical Capacitance

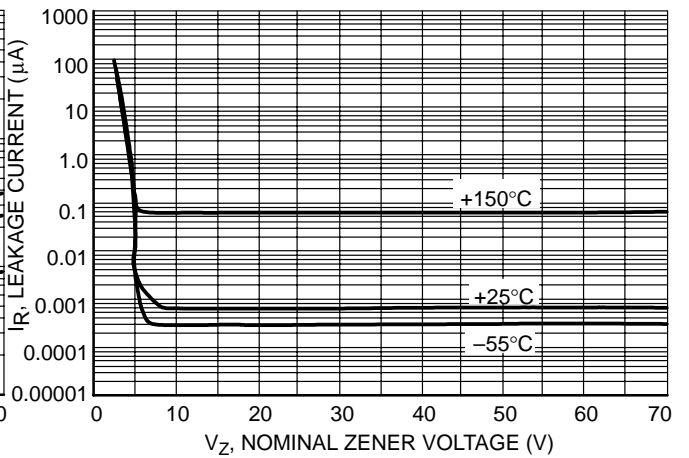


Figure 4. Typical Leakage Current

LM3Z2V0T1G Series, S-LM3Z2V0T1G Series

Typical Characteristics

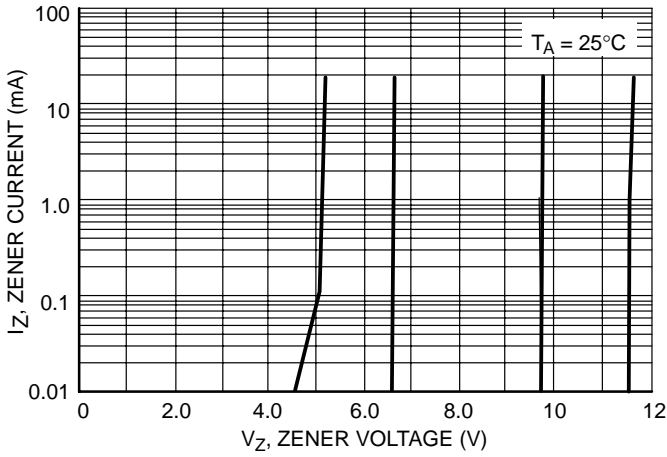


Figure 5. Zener Voltage versus Zener Current (V<sub>Z</sub> Up to 12 V)

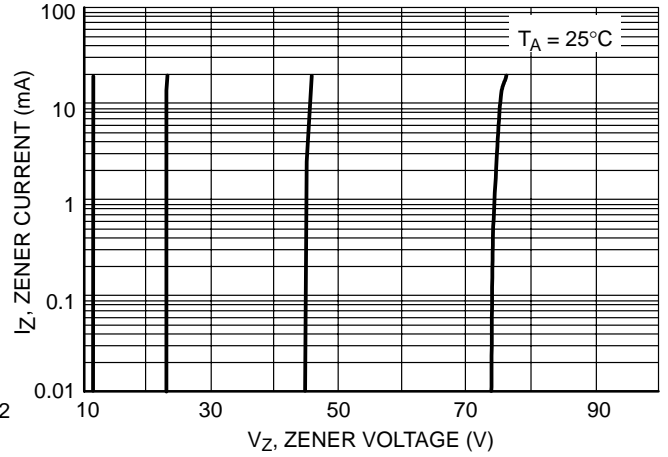


Figure 6. Zener Voltage versus Zener Current (12 V to 75 V)

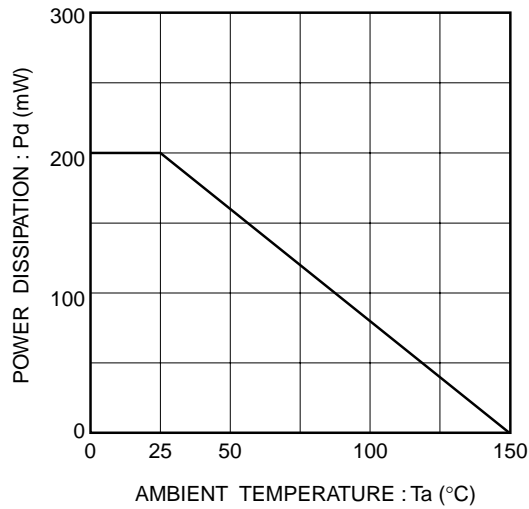
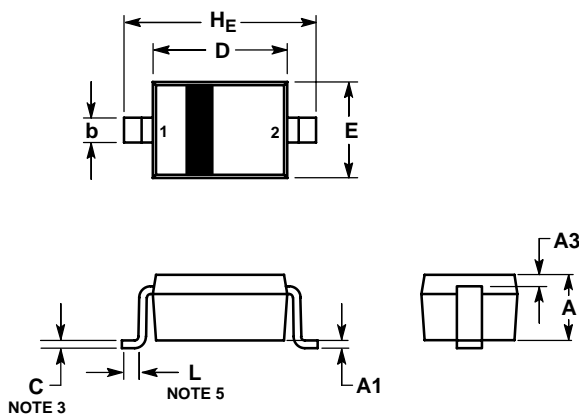


Figure 7. Steady State Power Derating

LM3Z2V0T1G Series, S-LM3Z2V0T1G Series

PACKAGE DIMENSIONS  
SOD-323

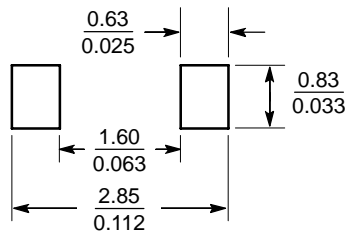


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS SPECIFIED PER L/F DRAWING WITH SOLDER PLATING.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DIMENSION L IS MEASURED FROM END OF RADIUS.

| DIM | MILLIMETERS |      |       | INCHES    |       |       |
|-----|-------------|------|-------|-----------|-------|-------|
|     | MIN         | NOM  | MAX   | MIN       | NOM   | MAX   |
| A   | 0.80        | 0.90 | 1.00  | 0.031     | 0.035 | 0.040 |
| A1  | 0.00        | 0.05 | 0.10  | 0.000     | 0.002 | 0.004 |
| A3  | 0.15 REF    |      |       | 0.006 REF |       |       |
| b   | 0.25        | 0.32 | 0.4   | 0.010     | 0.012 | 0.016 |
| C   | 0.089       | 0.12 | 0.177 | 0.003     | 0.005 | 0.007 |
| D   | 1.60        | 1.70 | 1.80  | 0.062     | 0.066 | 0.070 |
| E   | 1.15        | 1.25 | 1.35  | 0.045     | 0.049 | 0.053 |
| L   | 0.08        |      |       | 0.003     |       |       |
| HE  | 2.30        | 2.50 | 2.70  | 0.090     | 0.098 | 0.105 |

SOLDERING FOOTPRINT\*



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