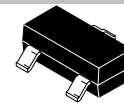


BZX84BxxxLT1G, BZX84CxxxLT1G Series, SZBZX84BxxxLT1G, SZBZX84CxxxLT1G Series



ON Semiconductor®

www.onsemi.com



SOT-23
CASE 318
STYLE 8



Zener Voltage Regulators

250 mW SOT-23 Surface Mount

This series of Zener diodes is offered in the convenient, surface mount plastic SOT-23 package. These devices are designed to provide voltage regulation with minimum space requirement. They are well suited for applications such as cellular phones, hand held portables, and high density PC boards.

Features

- 250 mW Rating on FR-4 or FR-5 Board
- Zener Breakdown Voltage Range – 2.4 V to 75 V
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications
- ESD Rating of Class 3 (> 16 kV) per Human Body Model
- Tight Tolerance Series Available (See Page 4)
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant

Mechanical Characteristics

CASE: Void-free, transfer-molded, thermosetting plastic case

FINISH: Corrosion resistant finish, easily Solderable

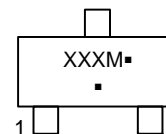
MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES:

260°C for 10 Seconds

POLARITY: Cathode indicated by polarity band

FLAMMABILITY RATING: UL 94 V-0

MARKING DIAGRAM



XXX = Device Code
M = Date Code*
▪ = Pb-Free Package

(Note: Microdot may be in either location)

*Date Code orientation may vary depending upon manufacturing location.

ORDERING INFORMATION

| Device | Package | Shipping† |
|-----------------|---------------------|-------------------------|
| BZX84CxxxLT1G | SOT-23 (Pb-Free) | 3,000 / Tape & Reel |
| SZBZX84CxxxLT1G | SOT-23 (Pb-Free) | 3,000 / Tape & Reel |
| BZX84CxxxLT3G | SOT-23 (Pb-Free) | 10,000 / Tape & Reel |
| SZBZX84CxxxLT3G | SOT-23 (Pb-Free) | 10,000 / Tape & Reel |
| BZX84BxxxLT1G | SOT-23 (Pb-Free) | 3,000 / Tape & Reel |
| SZBZX84BxxxLT1G | SOT-23 (Pb-Free) | 3,000 / Tape & Reel |
| BZX84BxxxLT3G | SOT-23 (Pb-Free) | 10,000 / Tape & Reel |
| SZBZX84BxxxLT3G | SOT-23 (Pb-Free) | 10,000 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

DEVICE MARKING INFORMATION

See specific marking information in the device marking column of the Electrical Characteristics table on page 3 of this data sheet.

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

BZX84BxxxLT1G, BZX84CxxxLT1G Series, SZBZX84BxxxLT1G, SZBZX84CxxxLT1G Series

MAXIMUM RATINGS

| Rating | Symbol | Max | Unit |
|--|-----------------------|-------------|----------------------------|
| Total Power Dissipation on FR-5 Board, (Note 1) @ $T_A = 25^\circ\text{C}$ Derated above 25°C | P_D | 250 | mW |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 2.0 | $\text{mW}/^\circ\text{C}$ |
| | | 500 | $^\circ\text{C}/\text{W}$ |
| Total Power Dissipation on Alumina Substrate, (Note 2) @ $T_A = 25^\circ\text{C}$ Derated above 25°C | P_D | 300 | mW |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 2.4 | $\text{mW}/^\circ\text{C}$ |
| | | 417 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature Range | T_J, T_{stg} | -65 to +150 | $^\circ\text{C}$ |

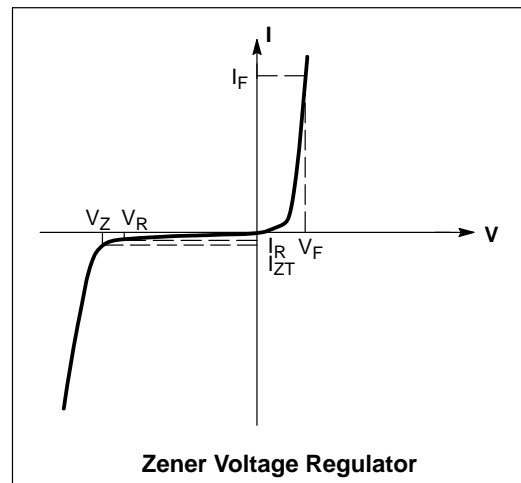
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

- FR-5 = 1.0 X 0.75 X 0.62 in.
- Alumina = 0.4 X 0.3 X 0.024 in., 99.5% alumina.

ELECTRICAL CHARACTERISTICS

(Pinout: 1-Anode, 2-No Connection, 3-Cathode) ($T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 0.90\text{ V Max.}$ @ $I_F = 10\text{ mA}$)

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



BZX84BxxxLT1G, BZX84CxxxLT1G Series, SZBZX84BxxxLT1G, SZBZX84CxxxLT1G Series

ELECTRICAL CHARACTERISTICS – BZX84CxxxLT1 SERIES (STANDARD TOLERANCE)

(Pinout: 1-Anode, 2-No Connection, 3-Cathode) (T_A = 25°C unless otherwise noted, V_F = 0.90 V Max. @ I_F = 10 mA)
(Devices listed in **bold, italic** are ON Semiconductor Preferred devices.)

| Device* | Device Marking | V _{Z1} (Volts) @ I _{ZT1} = 5 mA (Note 3) | | | Z _{1T1} (Ω) @ I _{ZT1} = 5 mA | V _{Z2} (V) @ I _{ZT2} = 1 mA (Note 3) | | Z _{2T2} (Ω) @ I _{ZT2} = 1 mA | V _{Z3} (V) @ I _{ZT3} = 20 mA (Note 3) | | Z _{3T3} (Ω) @ I _{ZT3} = 20 mA | Max Reverse Leakage Current | | θ _{VZ} (mV/k) @ I _{ZT1} = 5 mA | | C (pF) @ V _R = 0 f = 1 MHz |
|-------------------------|----------------|--|------------|-------------|---|--|-------------|---|---|-------------|--|-----------------------------|------------------------|---|-------------|---|
| | | Min | Nom | Max | | Min | Max | | Min | Max | | I _R (μA) | V _R (Volts) | Min | Max | |
| | | | | | | | | | | | | | | | | |
| BZX84C2V4LT1G | Z11 | 2.2 | 2.4 | 2.6 | 100 | 1.7 | 2.1 | 600 | 2.6 | 3.2 | 50 | 50 | 1 | -3.5 | 0 | 450 |
| BZX84C2V7LT1G | Z12 | 2.5 | 2.7 | 2.9 | 100 | 1.9 | 2.4 | 600 | 3 | 3.6 | 50 | 20 | 1 | -3.5 | 0 | 450 |
| BZX84C3V0LT1G | Z13 | 2.8 | 3 | 3.2 | 95 | 2.1 | 2.7 | 600 | 3.3 | 3.9 | 50 | 10 | 1 | -3.5 | 0 | 450 |
| BZX84C3V3LT1G | Z14 | 3.1 | 3.3 | 3.5 | 95 | 2.3 | 2.9 | 600 | 3.6 | 4.2 | 40 | 5 | 1 | -3.5 | 0 | 450 |
| BZX84C3V6LT1G | Z15 | 3.4 | 3.6 | 3.8 | 90 | 2.7 | 3.3 | 600 | 3.9 | 4.5 | 40 | 5 | 1 | -3.5 | 0 | 450 |
| BZX84C3V9LT1G | Z16 | 3.7 | 3.9 | 4.1 | 90 | 2.9 | 3.5 | 600 | 4.1 | 4.7 | 30 | 3 | 1 | -3.5 | -2.5 | 450 |
| BZX84C4V3LT1G | W9 | 4 | 4.3 | 4.6 | 90 | 3.3 | 4 | 600 | 4.4 | 5.1 | 30 | 3 | 1 | -3.5 | 0 | 450 |
| BZX84C4V7LT1/T3G | Z1 | 4.4 | 4.7 | 5 | 80 | 3.7 | 4.7 | 500 | 4.5 | 5.4 | 15 | 3 | 2 | -3.5 | 0.2 | 260 |
| BZX84C5V1LT1/T3G | Z2 | 4.8 | 5.1 | 5.4 | 60 | 4.2 | 5.3 | 480 | 5 | 5.9 | 15 | 2 | 2 | -2.7 | 1.2 | 225 |
| BZX84C5V6LT1/T3G | Z3 | 5.2 | 5.6 | 6 | 40 | 4.8 | 6 | 400 | 5.2 | 6.3 | 10 | 1 | 2 | -2.0 | 2.5 | 200 |
| BZX84C6V2LT1/T3G | Z4 | 5.8 | 6.2 | 6.6 | 10 | 5.6 | 6.6 | 150 | 5.8 | 6.8 | 6 | 3 | 4 | 0.4 | 3.7 | 185 |
| BZX84C6V8LT1/T3G | Z5 | 6.4 | 6.8 | 7.2 | 15 | 6.3 | 7.2 | 80 | 6.4 | 7.4 | 6 | 2 | 4 | 1.2 | 4.5 | 155 |
| BZX84C7V5LT1G | Z6 | 7 | 7.5 | 7.9 | 15 | 6.9 | 7.9 | 80 | 7 | 8 | 6 | 1 | 5 | 2.5 | 5.3 | 140 |
| BZX84C8V2LT1G | Z7 | 7.7 | 8.2 | 8.7 | 15 | 7.6 | 8.7 | 80 | 7.7 | 8.8 | 6 | 0.7 | 5 | 3.2 | 6.2 | 135 |
| BZX84C9V1LT1/T3G | Z8 | 8.5 | 9.1 | 9.6 | 15 | 8.4 | 9.6 | 100 | 8.5 | 9.7 | 8 | 0.5 | 6 | 3.8 | 7.0 | 130 |
| BZX84C10LT1G | Z9 | 9.4 | 10 | 10.6 | 20 | 9.3 | 10.6 | 150 | 9.4 | 10.7 | 10 | 0.2 | 7 | 4.5 | 8.0 | 130 |
| BZX84C11LT1G | Y1 | 10.4 | 11 | 11.6 | 20 | 10.2 | 11.6 | 150 | 10.4 | 11.8 | 10 | 0.1 | 8 | 5.4 | 9.0 | 130 |
| BZX84C12LT1G | Y2 | 11.4 | 12 | 12.7 | 25 | 11.2 | 12.7 | 150 | 11.4 | 12.9 | 10 | 0.1 | 8 | 6.0 | 10.0 | 130 |
| BZX84C13LT1G | Y3 | 12.4 | 13 | 14.1 | 30 | 12.3 | 14 | 170 | 12.5 | 14.2 | 15 | 0.1 | 8 | 7.0 | 11.0 | 120 |
| BZX84C15LT1/T3G | Y4 | 13.8 | 15 | 15.6 | 30 | 13.7 | 15.5 | 200 | 13.9 | 15.7 | 20 | 0.05 | 10.5 | 9.2 | 13.0 | 110 |
| BZX84C16LT1G | Y5 | 15.3 | 16 | 17.1 | 40 | 15.2 | 17 | 200 | 15.4 | 17.2 | 20 | 0.05 | 11.2 | 10.4 | 14.0 | 105 |
| BZX84C18LT1/T3G | Y6 | 16.8 | 18 | 19.1 | 45 | 16.7 | 19 | 225 | 16.9 | 19.2 | 20 | 0.05 | 12.6 | 12.4 | 16.0 | 100 |
| BZX84C20LT1G | Y7 | 18.8 | 20 | 21.2 | 55 | 18.7 | 21.1 | 225 | 18.9 | 21.4 | 20 | 0.05 | 14 | 14.4 | 18.0 | 85 |
| BZX84C22LT1G | Y8 | 20.8 | 22 | 23.3 | 55 | 20.7 | 23.2 | 250 | 20.9 | 23.4 | 25 | 0.05 | 15.4 | 16.4 | 20.0 | 85 |
| BZX84C24LT1G | Y9 | 22.8 | 24 | 25.6 | 70 | 22.7 | 25.5 | 250 | 22.9 | 25.7 | 25 | 0.05 | 16.8 | 18.4 | 22.0 | 80 |
| Device* | Device Marking | V _{Z1} Below @ I _{ZT1} = 2 mA | | | Z _{1T1} Below @ I _{ZT1} = 2 mA | V _{Z2} Below @ I _{ZT2} = 0.1 mA | | Z _{2T2} Below @ I _{ZT2} = 0.5 mA | V _{Z3} Below @ I _{ZT3} = 10 mA | | Z _{3T3} Below @ I _{ZT3} = 10 mA | Max Reverse Leakage Current | | θ _{VZ} (mV/k) Below @ I _{ZT1} = 2 mA | | C (pF) @ V _R = 0 f = 1 MHz |
| | | Min | Nom | Max | | Min | Max | | Min | Max | | I _R (μA) | V _R (V) | Min | Max | |
| | | | | | | | | | | | | | | | | |
| BZX84C27LT1G | Y10 | 25.1 | 27 | 28.9 | 80 | 25 | 28.9 | 300 | 25.2 | 29.3 | 45 | 0.05 | 18.9 | 21.4 | 25.3 | 70 |
| BZX84C30LT1G | Y11 | 28 | 30 | 32 | 80 | 27.8 | 32 | 300 | 28.1 | 32.4 | 50 | 0.05 | 21 | 24.4 | 29.4 | 70 |
| BZX84C33LT1/T3G | Y12 | 31 | 33 | 35 | 80 | 30.8 | 35 | 325 | 31.1 | 35.4 | 55 | 0.05 | 23.1 | 27.4 | 33.4 | 70 |
| BZX84C36LT1G | Y13 | 34 | 36 | 38 | 90 | 33.8 | 38 | 350 | 34.1 | 38.4 | 60 | 0.05 | 25.2 | 30.4 | 37.4 | 70 |
| BZX84C39LT1G | Y14 | 37 | 39 | 41 | 130 | 36.7 | 41 | 350 | 37.1 | 41.5 | 70 | 0.05 | 27.3 | 33.4 | 41.2 | 45 |
| BZX84C43LT1G | Y15 | 40 | 43 | 46 | 150 | 39.7 | 46 | 375 | 40.1 | 46.5 | 80 | 0.05 | 30.1 | 37.6 | 46.6 | 40 |
| BZX84C47LT1G | Y16 | 44 | 47 | 50 | 170 | 43.7 | 50 | 375 | 44.1 | 50.5 | 90 | 0.05 | 32.9 | 42.0 | 51.8 | 40 |
| BZX84C51LT1G | Y17 | 48 | 51 | 54 | 180 | 47.6 | 54 | 400 | 48.1 | 54.6 | 100 | 0.05 | 35.7 | 46.6 | 57.2 | 40 |
| BZX84C56LT1G | Y18 | 52 | 56 | 60 | 200 | 51.5 | 60 | 425 | 52.1 | 60.8 | 110 | 0.05 | 39.2 | 52.2 | 63.8 | 40 |
| BZX84C62LT1G | Y19 | 58 | 62 | 66 | 215 | 57.4 | 66 | 450 | 58.2 | 67 | 120 | 0.05 | 43.4 | 58.8 | 71.6 | 35 |
| BZX84C68LT1G | Y20 | 64 | 68 | 72 | 240 | 63.4 | 72 | 475 | 64.2 | 73.2 | 130 | 0.05 | 47.6 | 65.6 | 79.8 | 35 |
| BZX84C75LT1G | Y21 | 70 | 75 | 79 | 255 | 69.4 | 79 | 500 | 70.3 | 80.2 | 140 | 0.05 | 52.5 | 73.4 | 88.6 | 35 |

3. Zener voltage is measured with a pulse test current I_Z at an ambient temperature of 25°C.

*Includes SZ-prefix devices where applicable.

BZX84BxxxLT1G, BZX84CxxxLT1G Series, SZBZX84BxxxLT1G, SZBZX84CxxxLT1G Series

ELECTRICAL CHARACTERISTICS – BZX84BxxxL (Tight Tolerance Series)

(Pinout: 1-Anode, 2-No Connection, 3-Cathode) ($T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 0.90\text{ V Max.}$ @ $I_F = 10\text{ mA}$)

| Device | Device Marking | V_Z (Volts) @ $I_{ZT} = 5\text{ mA}$ (Note 4) | | | $Z_{ZT} (\Omega)$ @ $I_{ZT} = 5\text{ mA}$ (Note 4) | Max Reverse Leakage Current | | θ_{VZ} (mV/k) @ $I_{ZT} = 5\text{ mA}$ | | C (pF) @ $V_R = 0$, f = 1 MHz |
|--------------------|----------------|--|-----|------|---|-----------------------------|----------------|--|-----|--------------------------------------|
| | | Min | Nom | Max | | I_R μA | V_R Volts | Min | Max | |
| | | | | | @ | | | | | |
| BZX84B3V3LT1G | T2A | 3.23 | 3.3 | 3.37 | 95 | 5 | 1 | -3.5 | 0 | 450 |
| BZX84B4V7LT1G | T10 | 4.61 | 4.7 | 4.79 | 80 | 3 | 2 | -3.5 | 0.2 | 260 |
| BZX84B5V1LT1G | T11 | 5.00 | 5.1 | 5.20 | 60 | 2 | 2 | -2.7 | 1.2 | 225 |
| BZX84B5V6LT1G | T12 | 5.49 | 5.6 | 5.71 | 40 | 1 | 2 | -2 | 2.5 | 200 |
| BZX84B6V2LT1G | T13 | 6.08 | 6.2 | 6.32 | 10 | 3 | 4 | 0.4 | 3.7 | 185 |
| BZX84B6V8LT1G | T14 | 6.66 | 6.8 | 6.94 | 15 | 2 | 4 | 1.2 | 4.5 | 155 |
| BZX84B7V5LT1G | T15 | 7.35 | 7.5 | 7.65 | 15 | 1 | 5 | 2.5 | 5.3 | 140 |
| BZX84B8V2LT1G | T16 | 8.04 | 8.2 | 8.36 | 15 | 0.7 | 5 | 3.2 | 6.2 | 135 |
| BZX84B9V1LT1G, T3G | T17 | 8.92 | 9.1 | 9.28 | 15 | 0.5 | 6 | 3.8 | 7 | 130 |
| BZX84B10LT1G | T2E | 9.8 | 10 | 10.2 | 20 | 0.2 | 7 | 4.5 | 8 | 130 |
| BZX84B12LT1G | T18 | 11.8 | 12 | 12.2 | 25 | 0.1 | 8 | 6 | 10 | 130 |
| BZX84B15LT1G | T22 | 14.7 | 15 | 15.3 | 30 | 0.05 | 10.5 | 9.2 | 13 | 110 |
| BZX84B16LT1G | T19 | 15.7 | 16 | 16.3 | 40 | 0.05 | 11.2 | 10.4 | 14 | 105 |
| BZX84B18LT1G | T20 | 17.6 | 18 | 18.4 | 45 | 0.05 | 12.6 | 12.4 | 16 | 100 |
| BZX84B22LT1G | T24 | 21.6 | 22 | 22.4 | 55 | 0.05 | 15.4 | 16.4 | 20 | 85 |
| BZX84B24LT1G | T25 | 23.5 | 24 | 24.5 | 70 | 0.05 | 16.8 | 18.4 | 22 | 80 |

4. Zener voltage is measured with a pulse test current I_Z at an ambient temperature of 25°C .

ELECTRICAL CHARACTERISTICS – BZX84BxxxL (Tight Tolerance Series)

(Pinout: 1-Anode, 2-No Connection, 3-Cathode) ($T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 0.90\text{ V Max.}$ @ $I_F = 10\text{ mA}$)

| Device* | Device Marking | V_Z (Volts) @ $I_{ZT} = 2\text{ mA}$ (Note 4) | | | $Z_{ZT} (\Omega)$ @ $I_{ZT} = 2\text{ mA}$ (Note 4) | Max Reverse Leakage Current | | θ_{VZ} (mV/k) @ $I_{ZT} = 2\text{ mA}$ | | C (pF) @ $V_R = 0$, f = 1 MHz |
|--------------|----------------|--|-----|------|---|-----------------------------|----------------|--|------|--------------------------------------|
| | | Min | Nom | Max | | I_R μA | V_R Volts | Min | Max | |
| | | | | | @ | | | | | |
| BZX84B27LT1G | T27 | 26.5 | 27 | 27.5 | 80 | 0.05 | 18.9 | 21.4 | 25.3 | 70 |

*Includes SZ-prefix devices where applicable.

BZX84BxxxLT1G, BZX84CxxxLT1G Series, SZBZX84BxxxLT1G, SZBZX84CxxxLT1G Series

TYPICAL CHARACTERISTICS

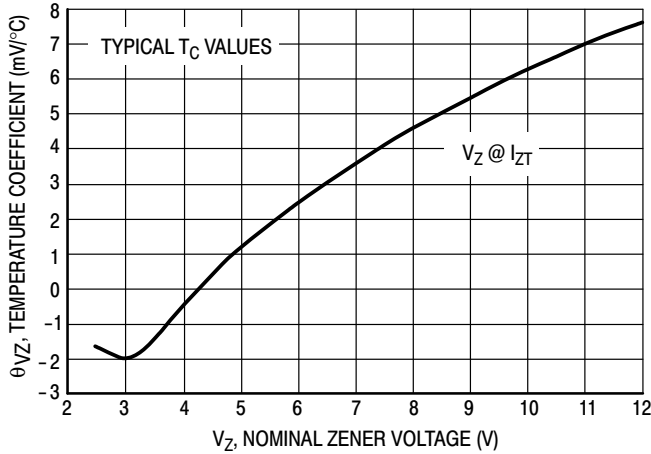


Figure 1. Temperature Coefficients
(Temperature Range -55°C to +150°C)

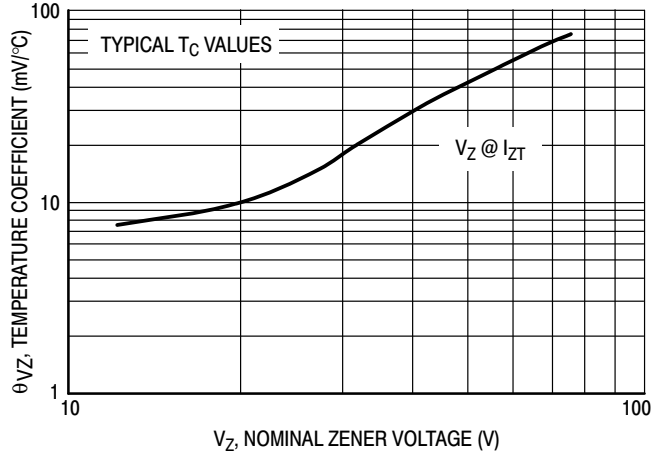


Figure 2. Temperature Coefficients
(Temperature Range -55°C to +150°C)

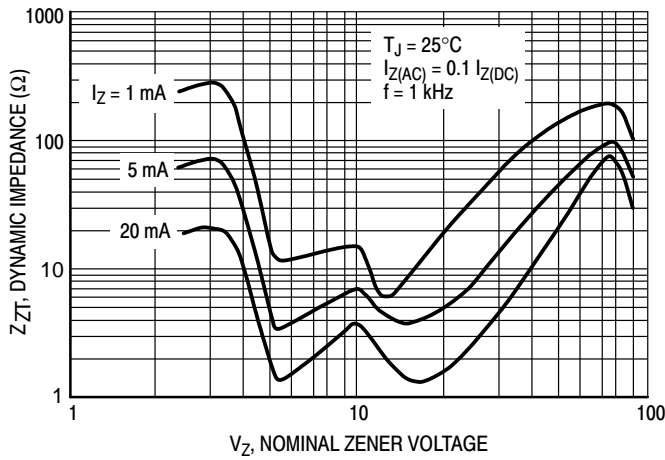


Figure 3. Effect of Zener Voltage on Zener Impedance

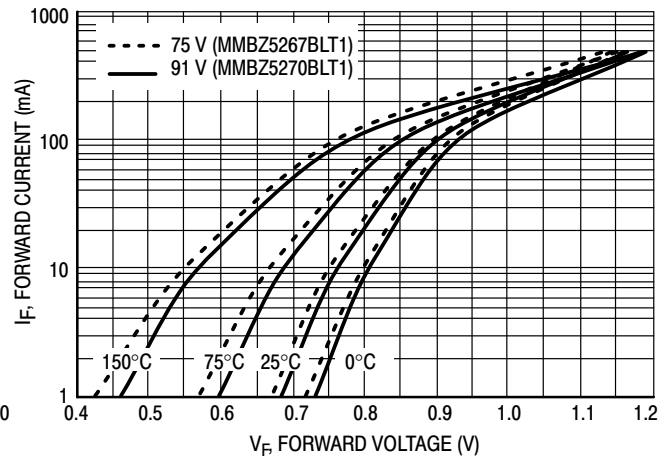


Figure 4. Typical Forward Voltage

BZX84BxxxLT1G, BZX84CxxxLT1G Series, SZBZX84BxxxLT1G, SZBZX84CxxxLT1G Series

TYPICAL CHARACTERISTICS

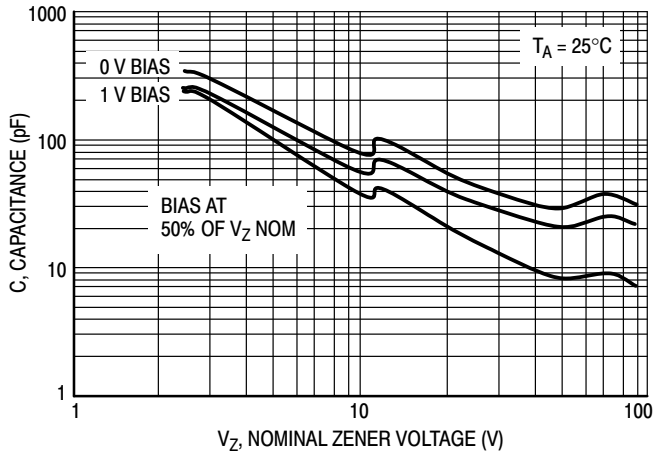


Figure 5. Typical Capacitance

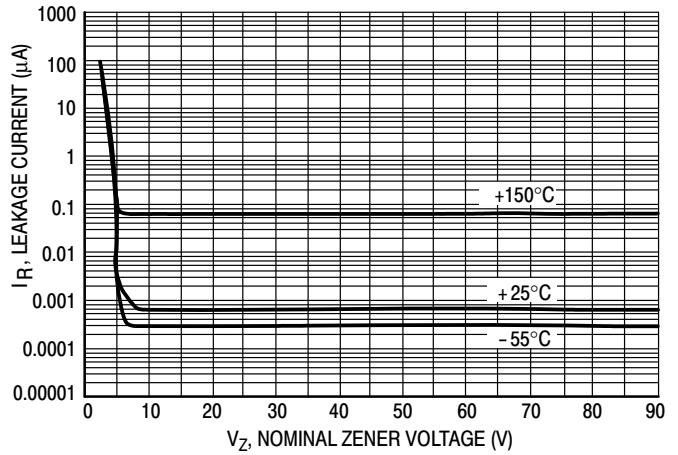


Figure 6. Typical Leakage Current

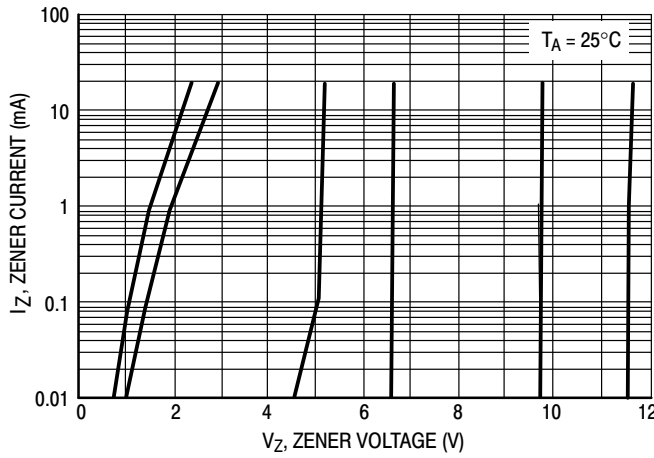


Figure 7. Zener Voltage versus Zener Current (V_Z Up to 12 V)

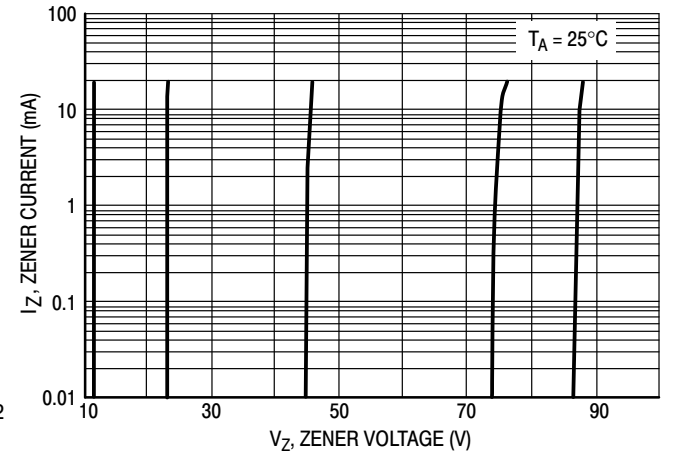
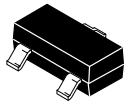


Figure 8. Zener Voltage versus Zener Current (12 V to 91 V)

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

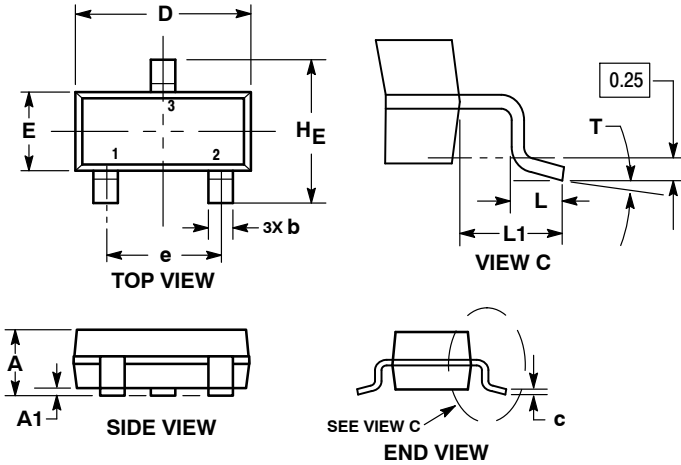
ON Semiconductor®



SOT-23 (TO-236)
CASE 318-08
ISSUE AS

DATE 30 JAN 2018

SCALE 4:1

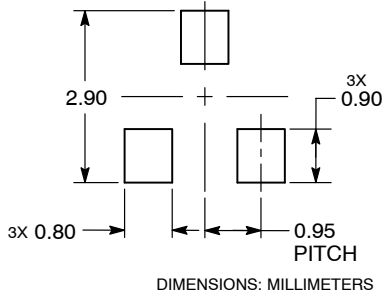


NOTES:

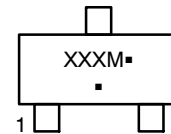
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.89 | 1.00 | 1.11 | 0.035 | 0.039 | 0.044 |
| A1 | 0.01 | 0.06 | 0.10 | 0.000 | 0.002 | 0.004 |
| b | 0.37 | 0.44 | 0.50 | 0.015 | 0.017 | 0.020 |
| c | 0.08 | 0.14 | 0.20 | 0.003 | 0.006 | 0.008 |
| D | 2.80 | 2.90 | 3.04 | 0.110 | 0.114 | 0.120 |
| E | 1.20 | 1.30 | 1.40 | 0.047 | 0.051 | 0.055 |
| e | 1.78 | 1.90 | 2.04 | 0.070 | 0.075 | 0.080 |
| L | 0.30 | 0.43 | 0.55 | 0.012 | 0.017 | 0.022 |
| L1 | 0.35 | 0.54 | 0.69 | 0.014 | 0.021 | 0.027 |
| HE | 2.10 | 2.40 | 2.64 | 0.083 | 0.094 | 0.104 |
| T | 0° | --- | 10° | 0° | --- | 10° |

RECOMMENDED SOLDERING FOOTPRINT



GENERIC MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code
■ = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "■", may or may not be present.

- | | | | |
|---|---|---|--|
| STYLE 1 THRU 5: CANCELLED | STYLE 6: PIN 1. BASE 2. EMITTER 3. COLLECTOR | STYLE 7: PIN 1. EMITTER 2. BASE 3. COLLECTOR | STYLE 8: PIN 1. ANODE 2. NO CONNECTION 3. CATHODE |
| STYLE 9: PIN 1. ANODE 2. ANODE 3. CATHODE | STYLE 10: PIN 1. DRAIN 2. SOURCE 3. GATE | STYLE 11: PIN 1. ANODE 2. CATHODE 3. CATHODE-ANODE | STYLE 12: PIN 1. CATHODE 2. CATHODE 3. ANODE |
| STYLE 13: PIN 1. SOURCE 2. DRAIN 3. GATE | STYLE 14: PIN 1. CATHODE 2. GATE 3. ANODE | STYLE 15: PIN 1. GATE 2. CATHODE 3. ANODE | STYLE 16: PIN 1. ANODE 2. CATHODE 3. CATHODE |
| STYLE 17: PIN 1. NO CONNECTION 2. ANODE 3. CATHODE | STYLE 18: PIN 1. NO CONNECTION 2. CATHODE 3. ANODE | STYLE 19: PIN 1. CATHODE 2. ANODE 3. CATHODE-ANODE | STYLE 20: PIN 1. CATHODE 2. ANODE 3. GATE |
| STYLE 21: PIN 1. GATE 2. SOURCE 3. DRAIN | STYLE 22: PIN 1. RETURN 2. OUTPUT 3. INPUT | STYLE 23: PIN 1. ANODE 2. ANODE 3. CATHODE | STYLE 24: PIN 1. GATE 2. DRAIN 3. SOURCE |
| STYLE 25: PIN 1. ANODE 2. CATHODE 3. GATE | STYLE 26: PIN 1. CATHODE 2. ANODE 3. NO CONNECTION | STYLE 27: PIN 1. CATHODE 2. CATHODE 3. CATHODE | STYLE 28: PIN 1. ANODE 2. ANODE 3. ANODE |

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