

Surface Mount Zener Diodes

FEATURES

- Zener voltage range selection: 2.4V to 39V
- Ideally suited for automated assembly processes
- Moisture sensitivity : Level 1 per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

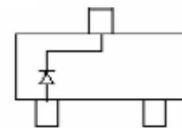
APPLICATIONS

- Low voltage stabilizers or voltage references
- Adapters
- Lighting application
- On-board DC/DC converter

MECHANICAL DATA

- Case: SOT-23
- Molding compound: UL flammability classification rating 94V-0
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1A whisker test
- Weight: 8mg (approximately)

| KEY PARAMETERS | | |
|----------------------------|------------|------|
| PARAMETER | VALUE | UNIT |
| V_Z | 2.4-39 | V |
| P_D | 300 | mW |
| V_F at $I_F=10\text{mA}$ | 0.9 | V |
| T_J Max. | 150 | °C |
| Package | SOT-23 | |
| Configuration | Single die | |



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | |
|---|-----------|-------------|------|
| PARAMETER | SYMBOL | VALUE | UNIT |
| Power dissipation | P_D | 300 | mW |
| Forward voltage @ $I_F=10\text{mA}$ | V_F | 0.9 | V |
| Junction temperature range | T_J | -65 to +150 | °C |
| Storage temperature range | T_{STG} | -65 to +150 | °C |

| THERMAL PERFORMANCE | | | |
|--|-----------------|-----|------|
| PARAMETER | SYMBOL | TYP | UNIT |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 417 | °C/W |

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| PART NUMBER (Note 1) | MARKING CODE | ZENER VOLTAGE RANGE (Note 2) | | | | ZENER IMPEDANCE (Note 3) | | | LEAKAGE CURRENT | | TYPICAL TEMPERATURE COEFFICIENT | |
|----------------------------|-----------------|---------------------------------|------|------|----------|-----------------------------|-------------------|----------|--------------------|------|---------------------------------------|------|
| | | $V_Z @ I_{ZT}$ | | | I_{ZT} | $Z_{ZT} @ I_{ZT}$ | $Z_{ZK} @ I_{ZK}$ | I_{ZK} | $I_Z @ V_Z$ | | @ I_{ZT} | |
| | | V | | | mA | Ω | Ω | mA | μA | V | mV/ $^\circ\text{C}$ | |
| | | Nom. | Min. | Max. | | Max. | Max. | | Max. | | Min. | Max. |
| BZX84C2V4 | Z11 | 2.4 | 2.2 | 2.6 | 5 | 100 | 600 | 1.0 | 50 | 1.0 | -3.5 | 0 |
| BZX84C2V7 | Z12 | 2.7 | 2.5 | 2.9 | 5 | 100 | 600 | 1.0 | 20 | 1.0 | -3.5 | 0 |
| BZX84C3V0 | Z13 | 3.0 | 2.8 | 3.2 | 5 | 95 | 600 | 1.0 | 10 | 1.0 | -3.5 | 0 |
| BZX84C3V3 | Z14 | 3.3 | 3.1 | 3.5 | 5 | 95 | 600 | 1.0 | 5.0 | 1.0 | -3.5 | 0 |
| BZX84C3V6 | Z15 | 3.6 | 3.4 | 3.8 | 5 | 90 | 600 | 1.0 | 5.0 | 1.0 | -3.5 | 0 |
| BZX84C3V9 | Z16 | 3.9 | 3.7 | 4.1 | 5 | 90 | 600 | 1.0 | 3.0 | 1.0 | -3.5 | 0 |
| BZX84C4V3 | Z17 | 4.3 | 4.0 | 4.6 | 5 | 90 | 600 | 1.0 | 3.0 | 1.0 | -3.5 | 0.0 |
| BZX84C4V7 | Z1 | 4.7 | 4.4 | 5.0 | 5 | 80 | 500 | 1.0 | 3.0 | 2.0 | -3.5 | 0.2 |
| BZX84C5V1 | Z2 | 5.1 | 4.8 | 5.4 | 5 | 60 | 480 | 1.0 | 2.0 | 2.0 | -2.7 | 1.2 |
| BZX84C5V6 | Z3 | 5.6 | 5.2 | 6.0 | 5 | 40 | 400 | 1.0 | 1.0 | 2.0 | -2.0 | 2.5 |
| BZX84C6V2 | Z4 | 6.2 | 5.8 | 6.6 | 5 | 10 | 150 | 1.0 | 3.0 | 4.0 | 0.4 | 3.7 |
| BZX84C6V8 | Z5 | 6.8 | 6.4 | 7.2 | 5 | 15 | 80 | 1.0 | 2.0 | 4.0 | 1.2 | 4.5 |
| BZX84C7V5 | Z6 | 7.5 | 7.0 | 7.9 | 5 | 15 | 80 | 1.0 | 1.0 | 5.0 | 2.5 | 5.3 |
| BZX84C8V2 | Z7 | 8.2 | 7.7 | 8.7 | 5 | 15 | 80 | 1.0 | 0.7 | 5.0 | 3.2 | 6.1 |
| BZX84C9V1 | Z8 | 9.1 | 8.5 | 9.6 | 5 | 15 | 100 | 1.0 | 0.5 | 6.0 | 3.8 | 7.0 |
| BZX84C10 | Z9 | 10 | 9.4 | 10.6 | 5 | 20 | 150 | 1.0 | 0.2 | 7.0 | 4.5 | 8.0 |
| BZX84C11 | Y1. | 11 | 10.4 | 11.6 | 5 | 20 | 150 | 1.0 | 0.1 | 8.0 | 5.4 | 9.0 |
| BZX84C12 | Y2. | 12 | 11.4 | 12.7 | 5 | 25 | 150 | 1.0 | 0.1 | 8.0 | 6.0 | 10.0 |
| BZX84C13 | Y3 | 13 | 12.4 | 14.1 | 5 | 30 | 170 | 1.0 | 0.1 | 8.0 | 7.0 | 11.0 |
| BZX84C15 | Y4 | 15 | 13.8 | 15.6 | 5 | 30 | 200 | 1.0 | 0.1 | 10.5 | 9.2 | 13.0 |
| BZX84C16 | Y5 | 16 | 15.3 | 17.1 | 5 | 40 | 200 | 1.0 | 0.1 | 11.2 | 10.4 | 14.0 |
| BZX84C18 | Y6 | 18 | 16.8 | 19.1 | 5 | 45 | 225 | 1.0 | 0.1 | 12.6 | 12.4 | 16.0 |
| BZX84C20 | Y7 | 20 | 18.8 | 21.2 | 5 | 55 | 225 | 1.0 | 0.1 | 14.0 | 14.4 | 18.0 |
| BZX84C22 | Y8 | 22 | 20.8 | 23.3 | 5 | 55 | 250 | 1.0 | 0.1 | 15.4 | 16.4 | 20.0 |
| BZX84C24 | Y9 | 24 | 22.8 | 25.6 | 5 | 70 | 250 | 1.0 | 0.1 | 16.8 | 18.4 | 22.0 |
| BZX84C27 | Y10 | 27 | 25.1 | 28.9 | 2 | 80 | 300 | 0.5 | 0.1 | 18.9 | 21.4 | 25.3 |
| BZX84C30 | Y11 | 30 | 28 | 32 | 2 | 80 | 300 | 0.5 | 0.1 | 21.0 | 24.4 | 29.4 |
| BZX84C33 | Y12 | 33 | 31 | 35 | 2 | 80 | 325 | 0.5 | 0.1 | 23.1 | 27.4 | 33.4 |
| BZX84C36 | Y13 | 36 | 34 | 38 | 2 | 90 | 350 | 0.5 | 0.1 | 25.2 | 30.4 | 37.4 |
| BZX84C39 | Y14 | 39 | 37 | 41 | 2 | 130 | 350 | 0.5 | 0.1 | 27.3 | 33.4 | 41.2 |

Notes:

- Valid provided that device terminals are kept at ambient temperature.
- Tested with pulses, 300 μs pulse width, period = 5 ms
- $f = 1\text{KHz}$

| ORDERING INFORMATION | | |
|-------------------------------------|----------------|----------------|
| ORDERING CODE (Note 1, 2) | PACKAGE | PACKING |
| BZX84Cxxx RF | SOT-23 | 3K / 7" Reel |
| BZX84Cxxx RFG | SOT-23 | 3K / 7" Reel |

Note 1:

"xxx" defines voltage from 2.4V (BZX84C2V4) to 39V (BZX84C39)

Note 2:

"G" means green compound (halogen free)

CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig. 1 Power Derating Curve

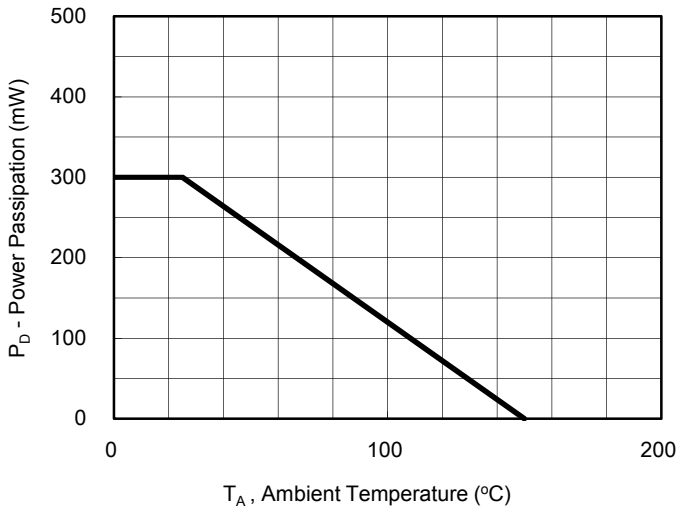


Fig. 2 Zener Breakdown Characteristics

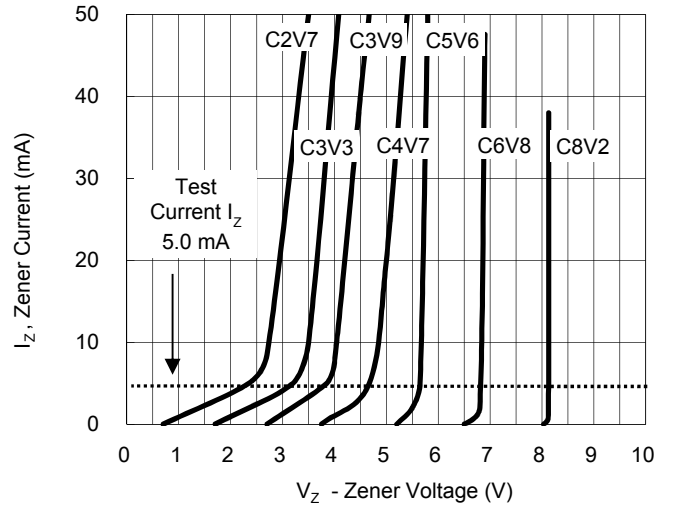


Fig. 3 Zener Breakdown Characteristics

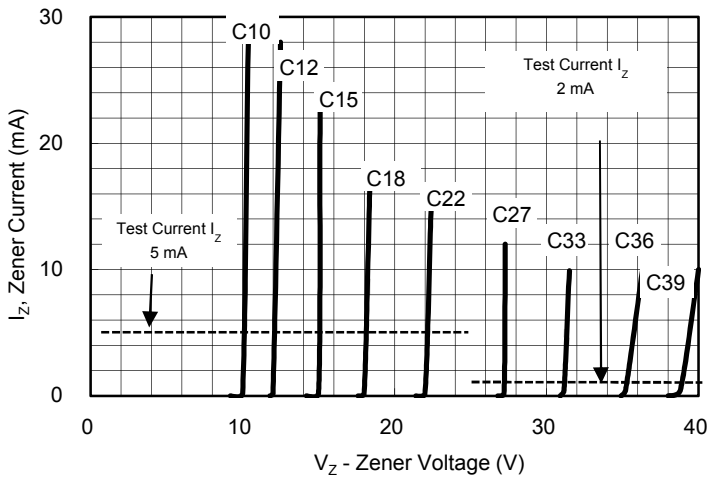
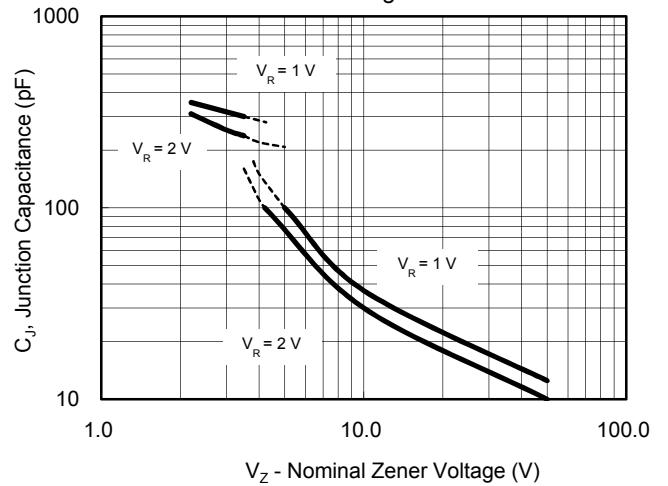
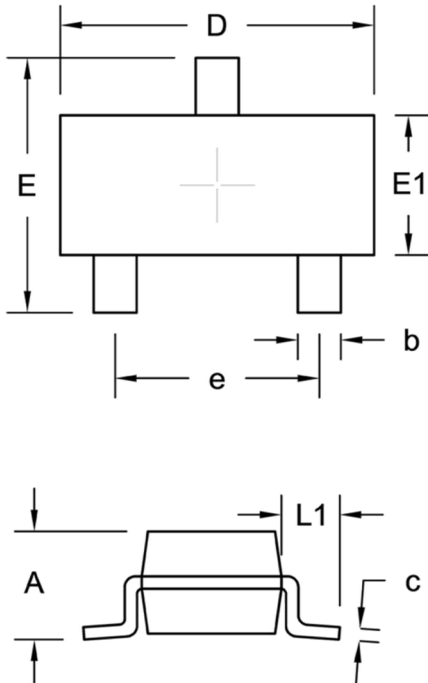


Fig. 4 Junction Capacitance VS. Nomial Zener Voltage



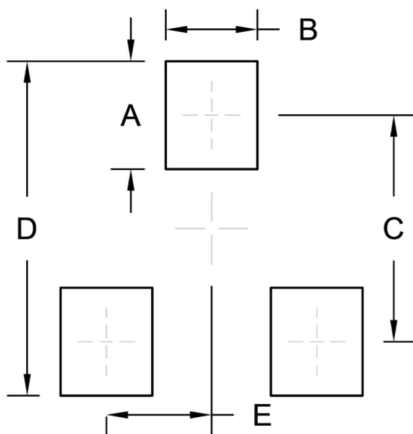
PACKAGE OUTLINE DIMENSION

SOT-23



| DIM. | Unit (mm) | | Unit (inch) | |
|------|-----------|------|-------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.89 | 1.12 | 0.035 | 0.044 |
| b | 0.30 | 0.50 | 0.012 | 0.020 |
| c | 0.08 | 0.20 | 0.003 | 0.008 |
| D | 2.80 | 3.04 | 0.110 | 0.120 |
| E | 2.10 | 2.64 | 0.083 | 0.104 |
| E1 | 1.20 | 1.40 | 0.047 | 0.055 |
| e | 1.90 BSC | | 0.075 BSC | |
| L1 | 0.54 REF. | | 0.021 REF. | |

SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A | 1.00 | 0.039 |
| B | 0.85 | 0.033 |
| C | 2.10 | 0.083 |
| D | 3.10 | 0.122 |
| E | 0.98 | 0.039 |

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