



**THE DATASHEET OF
BZX84C39W-7-F**



Features

- Planar Die Construction
- 200mW Power Dissipation
- Zener Voltages from 2.4V – 39V
- Ultra-Small Surface Mount Package
- **Lead Free/RoHS Compliant (Note 4)**
- **"Green" Device (Notes 1 and 2)**

Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 2. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Polarity: See Diagram
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.006 grams (approximate)



Top View



Device Schematic

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---------------------------------------|--------|-------|------|
| Forward Voltage @ $I_F = 10\text{mA}$ | V_F | 0.9 | V |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------------|------------------|
| Power Dissipation (Note 3) | P_D | 200 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 3) | $R_{\theta JA}$ | 625 | K/W |
| Operating and Storage Temperature Range | T_J, T_{STG} | -65 to +125 | $^\circ\text{C}$ |

- Notes:
1. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 2. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.
 3. Mounted on FR4 PC board with recommended pad layout which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 4. No purposefully added lead.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Type Number | Marking Code | Zener Voltage Range (Note 5) | | | | Maximum Zener Impedance (Note 6) | | | Maximum Reverse Current (Note 5) | | Temperature Coefficient of Zener Voltage @ $I_{ZT} = 5\text{mA}$ (mV/°C) | |
|-------------|--------------|------------------------------|---------|---------|----------|----------------------------------|-------------------|---------------|----------------------------------|---------|--|------|
| | | $V_Z @ I_{ZT}$ | | | I_{ZT} | $Z_{ZT} @ I_{ZT}$ | $Z_{ZK} @ I_{ZK}$ | I_{ZK} | I_R | @ V_R | Min | Max |
| | | Nom (V) | Min (V) | Max (V) | mA | Ω | mA | μA | V | | | |
| BZX84C2V4W | KRB | 2.4 | 2.2 | 2.6 | 5.0 | 100 | 600 | 1.0 | 50 | 1.0 | -3.5 | 0 |
| BZX84C2V7W | KRC | 2.7 | 2.5 | 2.9 | 5.0 | 100 | 600 | 1.0 | 20 | 1.0 | -3.5 | 0 |
| BZX84C3V0W | KRD | 3.0 | 2.8 | 3.2 | 5.0 | 95 | 600 | 1.0 | 20 | 1.0 | -3.5 | 0 |
| BZX84C3V3W | KRE | 3.3 | 3.1 | 3.5 | 5.0 | 95 | 600 | 1.0 | 5.0 | 1.0 | -3.5 | 0 |
| BZX84C3V6W | KRF | 3.6 | 3.4 | 3.8 | 5.0 | 90 | 600 | 1.0 | 5.0 | 1.0 | -3.5 | 0 |
| BZX84C3V9W | KRG | 3.9 | 3.7 | 4.1 | 5.0 | 90 | 600 | 1.0 | 3.0 | 1.0 | -3.5 | 0 |
| BZX84C4V3W | KRH | 4.3 | 4.0 | 4.6 | 5.0 | 90 | 600 | 1.0 | 3.0 | 1.0 | -3.5 | 0 |
| BZX84C4V7W | KR1 | 4.7 | 4.4 | 5.0 | 5.0 | 80 | 600 | 1.0 | 3.0 | 2.0 | -3.5 | 0.2 |
| BZX84C5V1W | KR2 | 5.1 | 4.8 | 5.4 | 5.0 | 60 | 500 | 1.0 | 2.0 | 2.0 | -2.7 | 1.2 |
| BZX84C5V6W | KR3 | 5.6 | 5.2 | 6.0 | 5.0 | 40 | 480 | 1.0 | 1.0 | 2.0 | -2.0 | 2.5 |
| BZX84C6V2W | KR4 | 6.2 | 5.8 | 6.6 | 5.0 | 10 | 400 | 1.0 | 3.0 | 4.0 | 0.4 | 3.7 |
| BZX84C6V8W | KR5 | 6.8 | 6.4 | 7.2 | 5.0 | 15 | 150 | 1.0 | 2.0 | 4.0 | 1.2 | 4.5 |
| BZX84C7V5W | KR6 | 7.5 | 7.0 | 7.9 | 5.0 | 15 | 80 | 1.0 | 1.0 | 5.0 | 2.5 | 5.3 |
| BZX84C8V2W | KR7 | 8.2 | 7.7 | 8.7 | 5.0 | 15 | 80 | 1.0 | 0.7 | 5.0 | 3.2 | 6.2 |
| BZX84C9V1W | KR8 | 9.1 | 8.5 | 9.6 | 5.0 | 15 | 80 | 1.0 | 0.5 | 6.0 | 3.8 | 7.0 |
| BZX84C10W | KR9 | 10 | 9.4 | 10.6 | 5.0 | 20 | 100 | 1.0 | 0.2 | 7.0 | 4.5 | 8.0 |
| BZX84C11W | KP1 | 11 | 10.4 | 11.6 | 5.0 | 20 | 150 | 1.0 | 0.1 | 8.0 | 5.4 | 9.0 |
| BZX84C12W | KP2 | 12 | 11.4 | 12.7 | 5.0 | 25 | 150 | 1.0 | 0.1 | 8.0 | 6.0 | 10.0 |
| BZX84C13W | KP3 | 13 | 12.4 | 14.1 | 5.0 | 30 | 150 | 1.0 | 0.1 | 8.0 | 7.0 | 11.0 |
| BZX84C15W | KP4 | 15 | 13.8 | 15.6 | 5.0 | 30 | 170 | 1.0 | 0.1 | 10.5 | 9.2 | 13.0 |
| BZX84C16W | KP5 | 16 | 15.3 | 17.1 | 5.0 | 40 | 200 | 1.0 | 0.1 | 11.2 | 10.4 | 14.0 |
| BZX84C18W | KP6 | 18 | 16.8 | 19.1 | 5.0 | 45 | 200 | 1.0 | 0.1 | 12.6 | 12.4 | 16.0 |
| BZX84C20W | KP7 | 20 | 18.8 | 21.2 | 5.0 | 55 | 225 | 1.0 | 0.1 | 14.0 | 14.4 | 18.0 |
| BZX84C22W | KP8 | 22 | 20.8 | 23.3 | 5.0 | 55 | 225 | 1.0 | 0.1 | 15.4 | 16.4 | 20.0 |
| BZX84C24W | KP9 | 24 | 22.8 | 25.6 | 5.0 | 70 | 250 | 1.0 | 0.1 | 16.8 | 18.4 | 22.0 |
| BZX84C27W | KPA | 27 | 25.1 | 28.9 | 2.0 | 80 | 250 | 0.5 | 0.1 | 18.9 | 21.4 | 25.3 |
| BZX84C30W | KPB | 30.0 | 28.0 | 32.0 | 2.0 | 80 | 300 | 0.5 | 0.1 | 21.0 | 24.4 | 29.4 |
| BZX84C33W | KPC | 33.0 | 31.0 | 35.0 | 2.0 | 80 | 300 | 0.5 | 0.1 | 23.1 | 27.4 | 33.4 |
| BZX84C36W | KPD | 36.0 | 34.0 | 38.0 | 2.0 | 90 | 325 | 0.5 | 0.1 | 25.2 | 30.4 | 37.4 |
| BZX84C39W | KPE | 39.0 | 37.0 | 41.0 | 2.0 | 130 | 350 | 0.5 | 0.1 | 27.3 | 33.4 | 41.2 |

Notes: 5. Short duration pulse test used to minimize self-heating effect.
6. $f = 1\text{KHz}$.

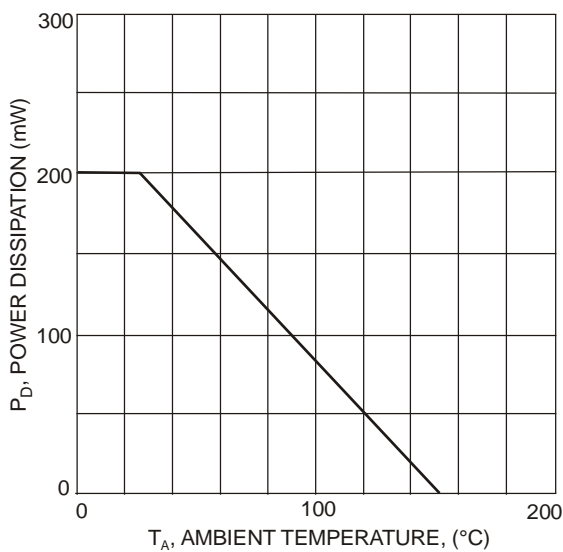


Fig. 1 Power Derating Curve

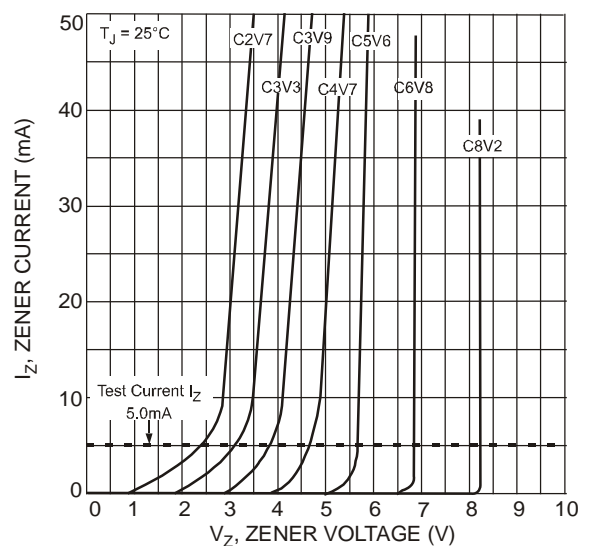


Fig. 2 Typical Zener Breakdown Characteristics



Fig. 3 Typical Zener Breakdown Characteristics



Fig. 4 Typical Total Capacitance vs. Nominal Zener Voltage

Ordering Information (Notes 2 & 7)

| Part Number | Case | Packaging |
|--------------------|---------|------------------|
| (Type Number)-7-F* | SOT-323 | 3000/Tape & Reel |

* Add "-7-F" to the appropriate type number in Electrical Characteristics Table on Page 2 example: 6.2V Zener = BZX84C6V2W-7-F.

Notes: 7. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



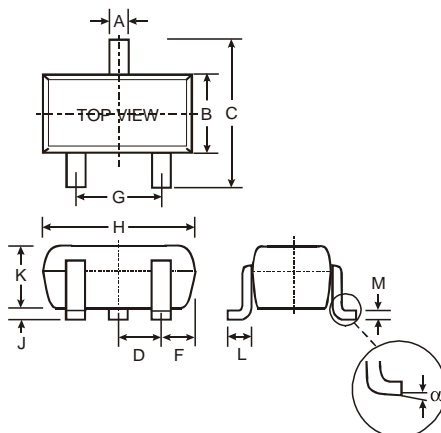
xxx = Product Type Marking Code
(See Electrical Characteristics Table)
YM = Date Code Marking
Y = Year (ex: N = 2002)
M = Month (ex: 9 = September)

Date Code Key

| Year | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | J | K | L | M | N | P | R | S | T | U | V | W | X | Y | Z |

| 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 |

Package Outline Dimensions



| SOT-323 | | |
|----------------------|--------------|------|
| Dim | Min | Max |
| A | 0.25 | 0.40 |
| B | 1.15 | 1.35 |
| C | 2.00 | 2.20 |
| D | 0.65 Nominal | |
| F | 0.30 | 0.40 |
| G | 1.20 | 1.40 |
| H | 1.80 | 2.20 |
| J | 0.0 | 0.10 |
| K | 0.90 | 1.00 |
| L | 0.25 | 0.40 |
| M | 0.10 | 0.18 |
| α | 0° | 8° |
| All Dimensions in mm | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 2.8 |
| X | 0.7 |
| Y | 0.9 |
| C | 1.9 |
| E | 1.0 |

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