



**THE DATASHEET OF  
BZX84C3V3S-7**



## Features

- Planar Die Construction
- 200mW Power Dissipation
- Zener Voltages from 2.4V - 39V
- Ultra-Small Surface Mount Package
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3 and 4)**

## Mechanical Data

- Case: SOT-363
- Case Material: Molded Plastic. 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 1)                           | $P_D$           | 200         | mW                 |
| Thermal Resistance, Junction to Ambient Air (Note 1) | $R_{\theta JA}$ | 625         | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range              | $T_J, T_{STG}$  | -65 to +150 | $^\circ\text{C}$   |

- Notes:
1. Mounted on FR4 PC Board with recommended pad layout which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  2. No purposefully added lead.
  3. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  4. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

**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       | $\Omega$                         | $\Omega$          | mA       | $\mu\text{A}$                    | V     |  |      |
| BZX84C2V4S  | KZB          | 2.4                          | 2.2     | 2.6     | 5.0      | 100                              | 600               | 1.0      | 50                               | 1.0   | -3.5   | 0    |
| BZX84C2V7S  | KZC          | 2.7                          | 2.5     | 2.9     | 5.0      | 100                              | 600               | 1.0      | 20                               | 1.0   | -3.5   | 0    |
| BZX84C3V0S  | KZD          | 3.0                          | 2.8     | 3.2     | 5.0      | 95                               | 600               | 1.0      | 10                               | 1.0   | -3.5   | 0    |
| BZX84C3V3S  | KZE          | 3.3                          | 3.1     | 3.5     | 5.0      | 95                               | 600               | 1.0      | 5.0                              | 1.0   | -3.5   | 0    |
| BZX84C3V6S  | KZF          | 3.6                          | 3.4     | 3.8     | 5.0      | 90                               | 600               | 1.0      | 5.0                              | 1.0   | -3.5   | 0    |
| BZX84C3V9S  | KZG          | 3.9                          | 3.7     | 4.1     | 5.0      | 90                               | 600               | 1.0      | 3.0                              | 1.0   | -3.5   | 0    |
| BZX84C4V3S  | KZH          | 4.3                          | 4.0     | 4.6     | 5.0      | 90                               | 600               | 1.0      | 3.0                              | 1.0   | -3.5   | 0    |
| BZX84C4V7S  | KZ1          | 4.7                          | 4.4     | 5.0     | 5.0      | 80                               | 500               | 1.0      | 3.0                              | 2.0   | -3.5   | 0.2  |
| BZX84C5V1S  | KZ2          | 5.1                          | 4.8     | 5.4     | 5.0      | 60                               | 480               | 1.0      | 2.0                              | 2.0   | -2.7   | 1.2  |
| BZX84C5V6S  | KZ3          | 5.6                          | 5.2     | 6.0     | 5.0      | 40                               | 400               | 1.0      | 1.0                              | 2.0   | -2.0   | -2.5 |
| BZX84C6V2S  | KZ4          | 6.2                          | 5.8     | 6.6     | 5.0      | 10                               | 150               | 1.0      | 3.0                              | 4.0   | 0.4  | 3.7  |
| BZX84C6V8S  | KZ5          | 6.8                          | 6.4     | 7.2     | 5.0      | 15                               | 80                | 1.0      | 2.0                              | 4.0   | 1.2  | 4.5  |
| BZX84C7V5S  | KZ6          | 7.5                          | 7.0     | 7.9     | 5.0      | 15                               | 80                | 1.0      | 1.0                              | 5.0   | 2.5  | 5.3  |
| BZX84C8V2S  | KZ7          | 8.2                          | 7.7     | 8.7     | 5.0      | 15                               | 80                | 1.0      | 0.7                              | 5.0   | 3.2  | 6.2  |
| BZX84C9V1S  | KZ8          | 9.1                          | 8.5     | 9.6     | 5.0      | 15                               | 100               | 1.0      | 0.5                              | 6.0   | 3.8  | 7.0  |
| BZX84C10S   | KZ9          | 10                           | 9.4     | 10.6    | 5.0      | 20                               | 150               | 1.0      | 0.2                              | 7.0   | 4.5  | 8.0  |
| BZX84C11S   | KY1          | 11                           | 10.4    | 11.6    | 5.0      | 20                               | 150               | 1.0      | 0.1                              | 8.0   | 5.4  | 9.0  |
| BZX84C12S   | KY2          | 12                           | 11.4    | 12.7    | 5.0      | 25                               | 150               | 1.0      | 0.1                              | 8.0   | 6.0  | 10.0 |
| BZX84C13S   | KY3          | 13                           | 12.4    | 14.1    | 5.0      | 30                               | 170               | 1.0      | 0.1                              | 8.0   | 7.0  | 11.0 |
| BZX84C15S   | KY4          | 15                           | 13.8    | 15.6    | 5.0      | 30                               | 200               | 1.0      | 0.1                              | 10.5  | 9.2  | 13.0 |
| BZX84C16S   | KY5          | 16                           | 15.3    | 17.1    | 5.0      | 40                               | 200               | 1.0      | 0.1                              | 11.2  | 10.4   | 14.0 |
| BZX84C18S   | KY6          | 18                           | 16.8    | 19.1    | 5.0      | 45                               | 225               | 1.0      | 0.1                              | 12.6  | 12.4   | 16.0 |
| BZX84C20S   | KY7          | 20                           | 18.8    | 21.2    | 5.0      | 55                               | 225               | 1.0      | 0.1                              | 14.0  | 14.4   | 18.0 |
| BZX84C22S   | KY8          | 22                           | 20.8    | 23.3    | 5.0      | 55                               | 250               | 1.0      | 0.1                              | 15.4  | 16.4   | 20.0 |
| BZX84C24S   | KY9          | 24                           | 22.8    | 25.6    | 5.0      | 70                               | 250               | 1.0      | 0.1                              | 16.8  | 18.4   | 22.0 |
| BZX84C27S   | KYA          | 27                           | 25.1    | 28.9    | 2.0      | 80                               | 300               | 0.5      | 0.1                              | 18.9  | 21.4   | 25.3 |
| BZX84C30S   | KYB          | 30                           | 28.0    | 32.0    | 2.0      | 80                               | 300               | 0.5      | 0.1                              | 21.0  | 24.4   | 29.4 |
| BZX84C33S   | KYC          | 33                           | 31.0    | 35.0    | 2.0      | 80                               | 325               | 0.5      | 0.1                              | 23.1  | 27.4   | 33.4 |
| BZX84C36S   | KYD          | 36                           | 34.0    | 38.0    | 2.0      | 90                               | 350               | 0.5      | 0.1                              | 25.2  | 30.4   | 37.4 |
| BZX84C39S   | KYE          | 39                           | 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

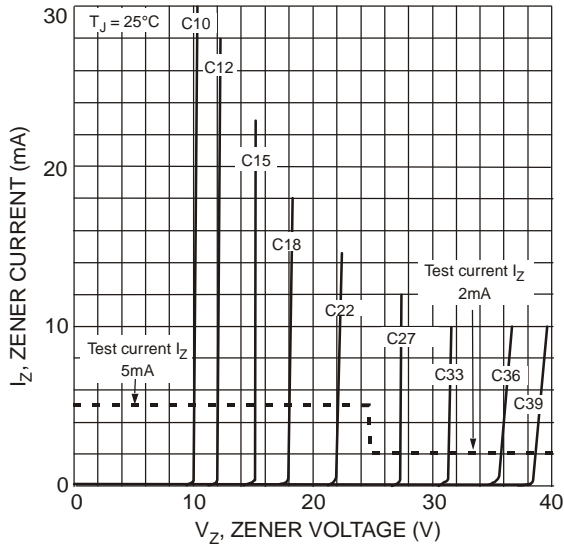


Fig. 3 Typical Zener Breakdown Characteristics



Fig. 4 Typical Total Capacitance vs. Nominal Zener Voltage

**Ordering Information** (Note 7)

| Part Number        | Case    | Packaging        |
|--------------------|---------|------------------|
| (Type Number)-7-F* | SOT-363 | 3000/Tape & Reel |

\*Add "-7-F" to the appropriate type number in Electrical Characteristics Table from Page 2 example: 6.2V Zener = BZX84C6V2S-7-F.

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

**Marking Information**



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

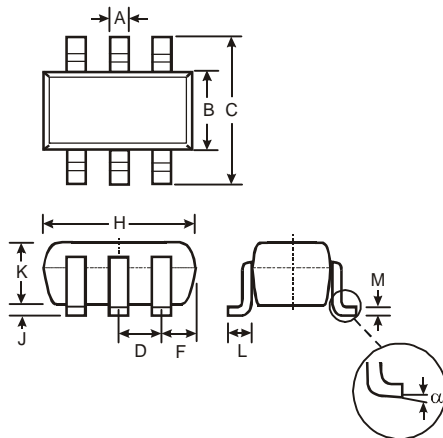
Date Code Key

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2111 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | N    | P    | R    | S    | T    | U    | V    | W    | X    | Y    | Z    |

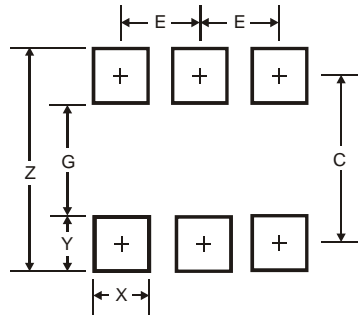
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

**Package Outline Dimensions**



| SOT-363              |              |      |
|----------------------|--------------|------|
| Dim                  | Min          | Max  |
| A                    | 0.10         | 0.30 |
| B                    | 1.15         | 1.35 |
| C                    | 2.00         | 2.20 |
| D                    | 0.65 Nominal |      |
| F                    | 0.30         | 0.40 |
| H                    | 1.80         | 2.20 |
| J                    | —            | 0.10 |
| K                    | 0.90         | 1.00 |
| L                    | 0.25         | 0.40 |
| M                    | 0.10         | 0.25 |
| α                    | 0°           | 8°   |
| All Dimensions in mm |              |      |

**Suggested Pad Layout**



| Dimensions | Value (in mm) |
|------------|---------------|
| <b>Z</b>   | 2.5           |
| <b>G</b>   | 1.3           |
| <b>X</b>   | 0.42          |
| <b>Y</b>   | 0.6           |
| <b>C</b>   | 1.9           |
| <b>E</b>   | 0.65          |

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