

## Features

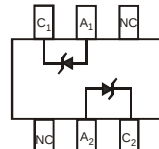
- Planar Die Construction
- 200mW Power Dissipation
- Zener Voltages from 2.4V - 39V
- Ultra-Small Surface Mount Package
- Lead Free/RoHS Compliant (Note 2)**
- "Green" Device (Note 3 and 4)**



Top View

## 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)



Device Schematic

## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                          | Symbol         | Value | Unit |
|-----------------------------------------|----------------|-------|------|
| Forward Voltage @ I <sub>F</sub> = 10mA | V <sub>F</sub> | 0.9   | V    |

## Thermal Characteristics

| Characteristic                                       | Symbol                            | Value       | Unit |
|------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 1)                           | P <sub>D</sub>                    | 200         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 1) | R <sub>θJA</sub>                  | 625         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

- Notes:
- Mounted on FR4 PC Board with recommended pad layout which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  - No purposefully added lead.
  - 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).
  - 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<sub>A</sub> = 25°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 <sub>ZT</sub> = 5mA mV/°C |      |
|-------------|--------------|----------------------------------|---------|---------|-----------------|-----------------------------------|-----------------------------------|-----------------|----------------------------------|----------------|------------------------------------------------------------------------|------|
|             |              | V <sub>Z</sub> @ I <sub>ZT</sub> |         |         | I <sub>ZT</sub> | Z <sub>YT</sub> @ I <sub>ZT</sub> | Z <sub>ZK</sub> @ I <sub>ZK</sub> | I <sub>ZK</sub> | I <sub>R</sub>                   | V <sub>R</sub> |                                                                        |      |
|             |              | Nom (V)                          | Min (V) | Max (V) | mA              | Ω                                 | Ω                                 | mA              | μA                               | V              | Min                                                                    | Max  |
| 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 = 1KHz.

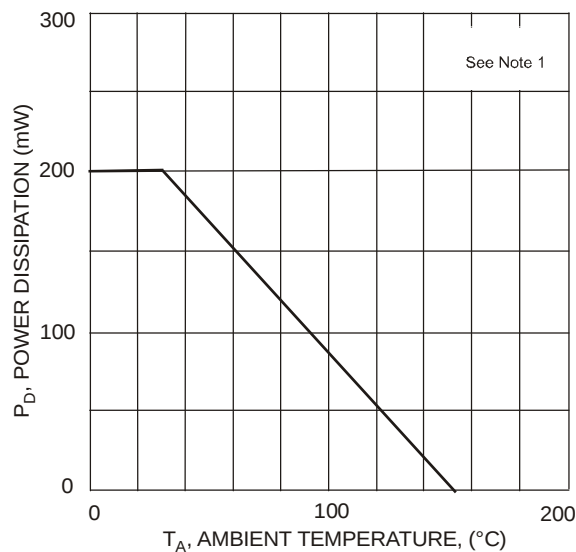


Fig. 1 Power Derating Curve

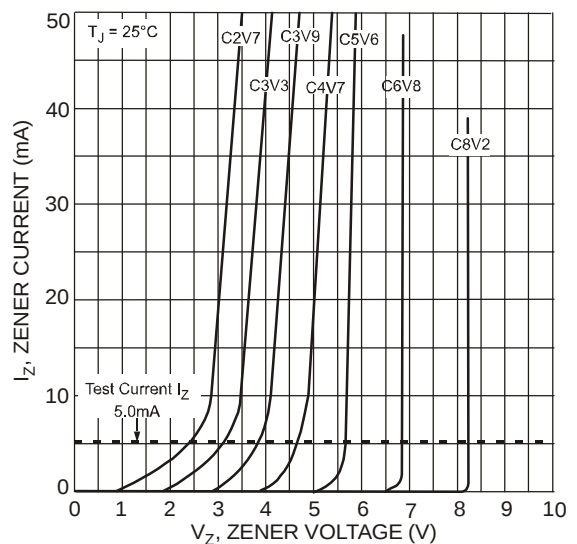


Fig. 2 Typical Zener Breakdown Characteristics

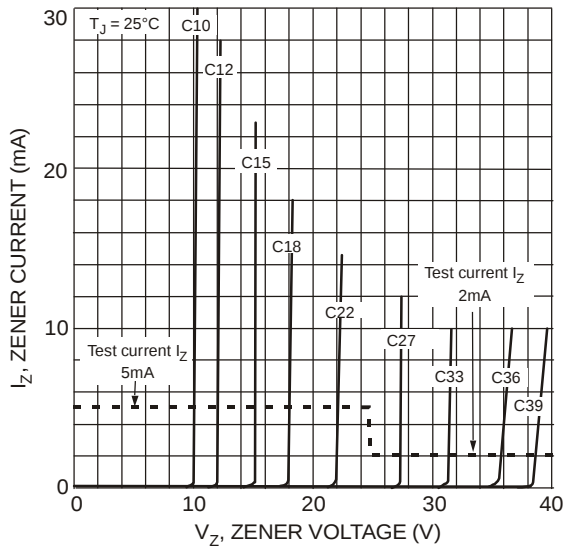


Fig. 3 Typical Zener Breakdown Characteristics

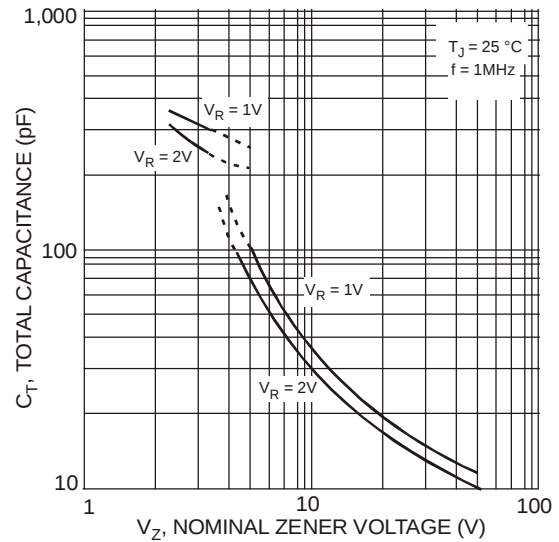


Fig. 4 Typical Total Capacitance vs. Nominal Zener Voltage

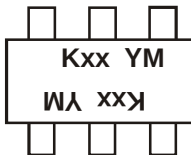
## Ordering Information (Note 7)

| 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)

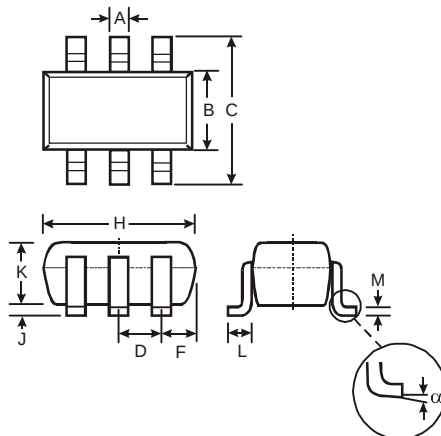
### Date Code Key

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

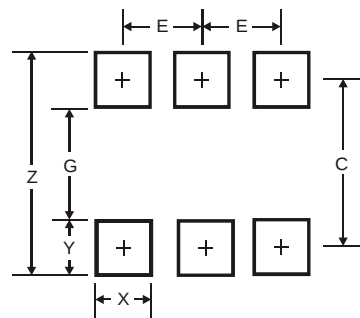
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

## 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) |
|------------|---------------|
| Z          | 2.5           |
| G          | 1.3           |
| X          | 0.42          |
| Y          | 0.6           |
| C          | 1.9           |
| E          | 0.65          |

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