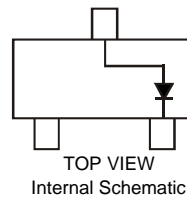


## Features

- Fast Switching Speed: Maximum of 4ns
- Low Forward Voltage: Maximum of 0.715V at 1mA
- Low Capacitance: Maximum of 2pF
- Surface Mount Package Ideally Suited for Automated Insertion
- For General Purpose Switching Applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Solderable per MIL-STD-202, Method 208 **e3**
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Polarity: See Diagram
- Weight: 0.008 grams (approximate)

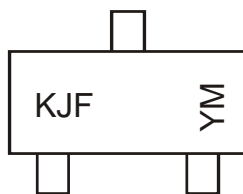


## Ordering Information (Note 4 & 5)

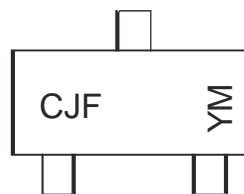
| Part Number | Case  | Packaging        |
|-------------|-------|------------------|
| BAL99-7-F   | SOT23 | 3000/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
  5. Product manufactured with Date Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.

## Marking Information



K = SAT (Shanghai Assembly / Test site)  
 JF = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: Z = 2012  
 M = Month ex: 9 = September



C = CAT (Chengdu Assembly / Test site)  
 JF = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: Z = 2012  
 M = Month ex: 9 = September

### Date Code Key

| Year | 1998 | 1999 | 2000 | 2001 | 2002 | ..... | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------|------|------|------|------|------|-------|------|------|------|------|------|------|------|------|------|
| Code | J    | K    | L    | M    | N    | ..... | Z    | A    | B    | C    | D    | E    | F    | G    | H    |

| 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   |

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                            | Symbol              | Value       | Unit |   |
|---|---------------------|-------------|------|---|
| Non-Repetitive Peak Reverse Voltage       | V <sub>RM</sub>     | 100         | V    |   |
| Peak Repetitive Reverse Voltage           | V <sub>RRM</sub>    | 75          | V    |   |
| Working Peak Reverse Voltage              | V <sub>RWM</sub>    |             |      |   |
| DC Blocking Voltage                       | V <sub>R</sub>      |             |      |   |
| RMS Reverse Voltage                       | V <sub>R(RMS)</sub> | 53          | V    |   |
| Forward Continuous Current (Note 6)       | I <sub>FM</sub>     | 300         | mA   |   |
| Non-Repetitive Peak Forward Surge Current | I <sub>FSM</sub>    | @ t = 1.0μs | 2.0  | A |
|   |                     | @ t = 1.0s  | 1.0  |   |

**Thermal Characteristics**

| Characteristic                                      | Symbol                            | Value       | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation (Note 6)                          | P <sub>D</sub>                    | 350         | mW   |
| Thermal Resistance Junction to Ambient Air (Note 6) | R <sub>θJA</sub>                  | 357         | °C/W |
| Operating and Storage Temperature Range             | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                     | Symbol             | Min | Max   | Unit | Test Condition  |
|------------------------------------|--------------------|-----|-------|------|---|
| Reverse Breakdown Voltage (Note 7) | V <sub>(BR)R</sub> | 75  | —     | V    | I <sub>R</sub> = 100μA  |
| Forward Voltage                    | V <sub>F</sub>     | —   | 0.715 | V    | I <sub>F</sub> = 1.0mA  |
|                                    |                    |     | 0.855 |      | I <sub>F</sub> = 10mA   |
|                                    |                    |     | 1.0   |      | I <sub>F</sub> = 50mA   |
|                                    |                    |     | 1.25  |      | I <sub>F</sub> = 150mA  |
| Reverse Current (Note 7)           | I <sub>R</sub>     | —   | 2.5   | μA   | V <sub>R</sub> = 75V  |
|                                    |                    |     | 50    |      | V <sub>R</sub> = 75V, T <sub>J</sub> = +150°C   |
|                                    |                    |     | 30    |      | V <sub>R</sub> = 25V, T <sub>J</sub> = +150°C   |
|                                    |                    |     | 25    |      | V <sub>R</sub> = 20V  |
| Total Capacitance                  | C <sub>T</sub>     | —   | 2.0   | pF   | V <sub>R</sub> = 0, f = 1.0MHz  |
| Reverse Recovery Time              | t <sub>rr</sub>    | —   | 4.0   | ns   | I <sub>F</sub> = I <sub>R</sub> = 10mA,<br>I <sub>rr</sub> = 0.1 x I <sub>R</sub> , R <sub>L</sub> = 100Ω |

- Notes:
- Part mounted on FR-4 board with recommended pad layout, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  - Short duration pulse test used to minimize self-heating effect.

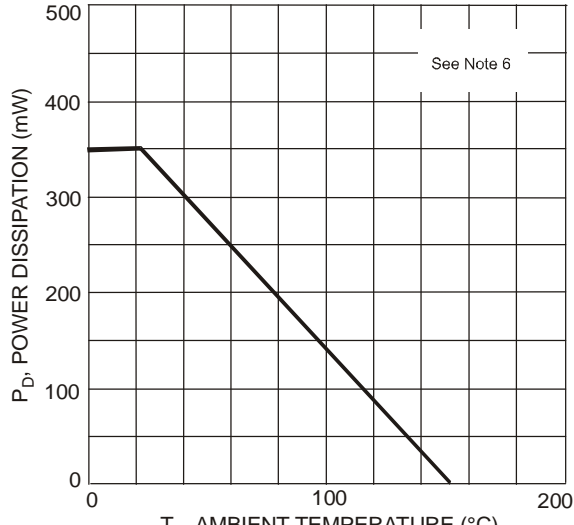


Figure 1 Power Derating Curve

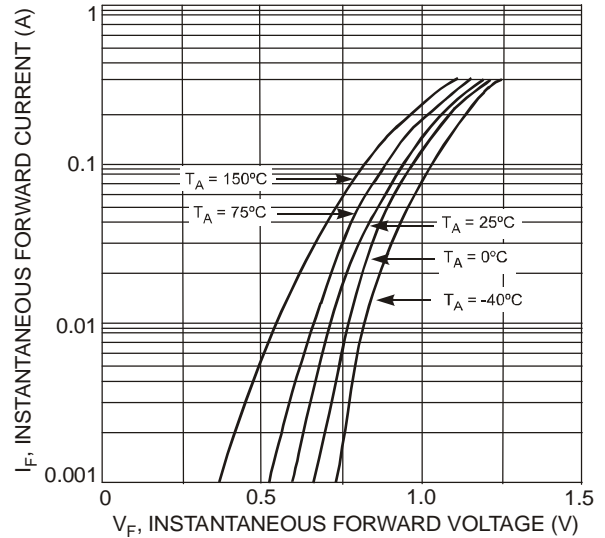


Figure 2 Typical Forward Characteristics

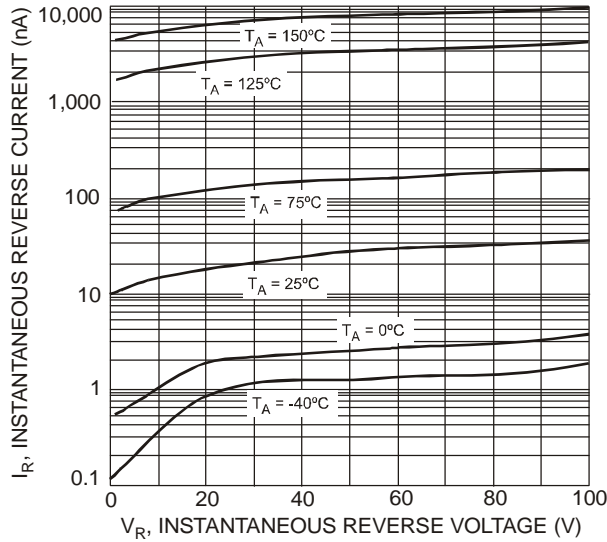


Figure 3 Typical Reverse Characteristics

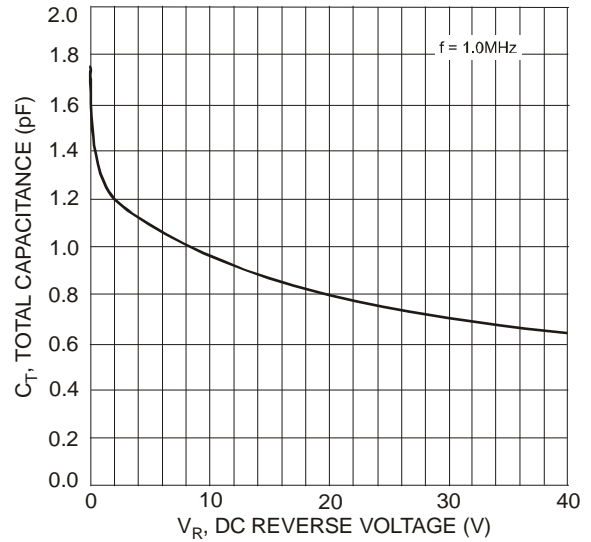
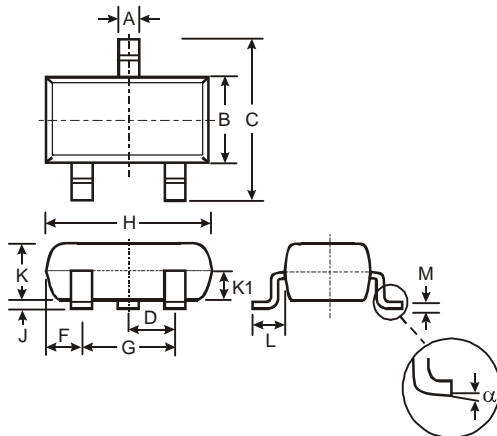


Figure 4 Total Capacitance vs. Reverse Voltage

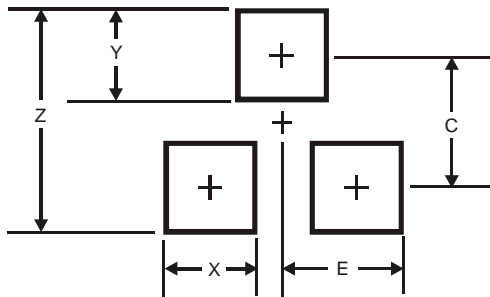
**Package Outline Dimensions**



| SOT23 |       |      |       |
|-------|-------|------|-------|
| Dim   | Min   | Max  | Typ   |
| A     | 0.37  | 0.51 | 0.40  |
| B     | 1.20  | 1.40 | 1.30  |
| C     | 2.30  | 2.50 | 2.40  |
| D     | 0.89  | 1.03 | 0.915 |
| F     | 0.45  | 0.60 | 0.535 |
| G     | 1.78  | 2.05 | 1.83  |
| H     | 2.80  | 3.00 | 2.90  |
| J     | 0.013 | 0.10 | 0.05  |
| K     | 0.903 | 1.10 | 1.00  |
| K1    | -     | -    | 0.400 |
| L     | 0.45  | 0.61 | 0.55  |
| M     | 0.085 | 0.18 | 0.11  |
| α     | 0°    | 8°   | -     |

All Dimensions in mm

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.9           |
| X          | 0.8           |
| Y          | 0.9           |
| C          | 2.0           |
| E          | 1.35          |

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