

## Features

- Fast Switching Speed
- Surface Mount Package Ideally Suited for Automated Insertion
- For General Purpose Switching Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3 & 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

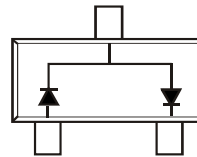
## Mechanical Data

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

SOT23



Top View

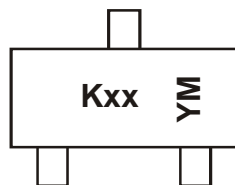

 Top View  
Internal Schematic

## Ordering Information (Note 5)

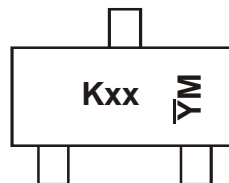
| Part Number | Compliance | Case  | Packaging          |
|-------------|------------|-------|--------------------|
| BAV99-7-F   | Standard   | SOT23 | 3,000/Tape & Reel  |
| BAV99-13-F  | Standard   | SOT23 | 10,000/Tape & Reel |
| BAV99Q-7-F  | Automotive | SOT23 | 3,000/Tape & Reel  |
| BAV99Q-13-F | Automotive | SOT23 | 10,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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. Product manufactured with Date Code 9W (week 39, 2009) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 9W are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



xx = JE, Product Type Marking Code  
 YM = Date Code Marking for Shanghai  
 Assembly / Test site  
 Y = Year (ex: F = 2018)  
 M = Month (ex: 9 = September)



xx = JE, Product Type Marking Code  
 YM = Date Code Marking for Chengdu  
 Assembly / Test site  
 Y = Year (ex: F = 2018)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 1998 | 1999 | ..... | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------|------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | J    | K    | ..... | Y    | Z    | A    | B    | C    | D    | E    | F    | G    | H    | I    | J    |

| 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>R<sub>RM</sub></sub> | 75          | V    |
| Working Peak Reverse Voltage              | V <sub>R<sub>WM</sub></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  |
|   |                             | @ 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> = 2.5μA  |
| 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    | μA   | V <sub>R</sub> = 75V, T <sub>J</sub> = +150°C   |
|                                    |                    |     | 30    | μA   | V <sub>R</sub> = 25V, T <sub>J</sub> = +150°C   |
|                                    |                    |     | 25    | nA   | 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: 6. Part mounted on Polyimide PC board with pad dimensions 1.13mm x 1.27mm.  
7. Short duration pulse test used to minimize self-heating effect.

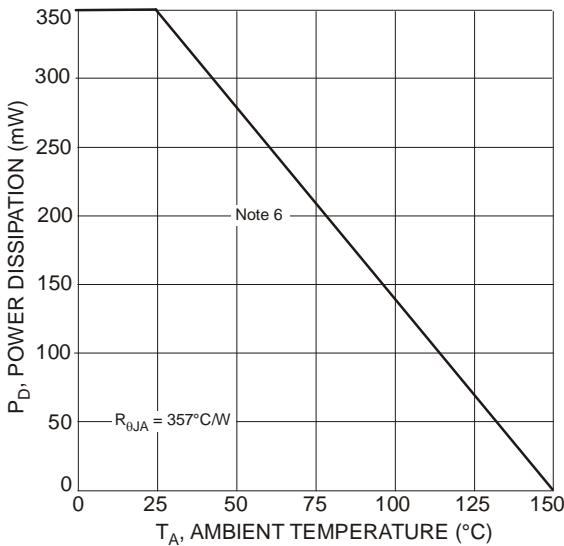


Fig. 1 Power Derating Curve

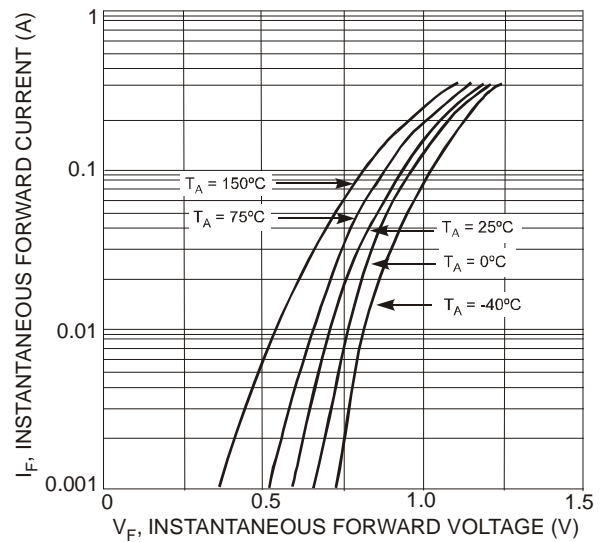


Fig. 2 Forward Characteristics

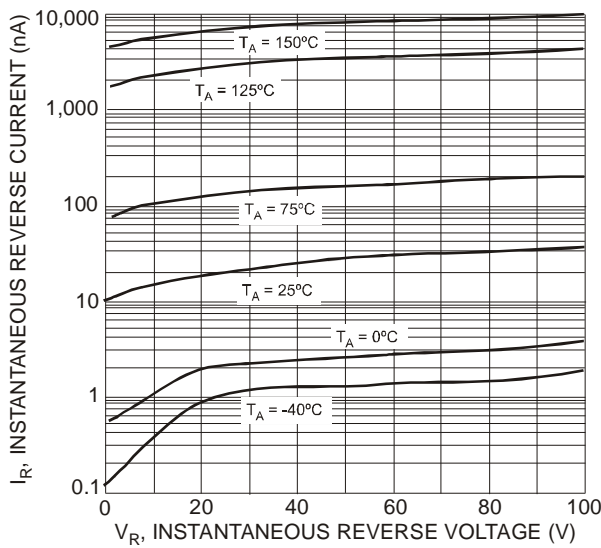


Fig. 3 Typical Reverse Characteristics

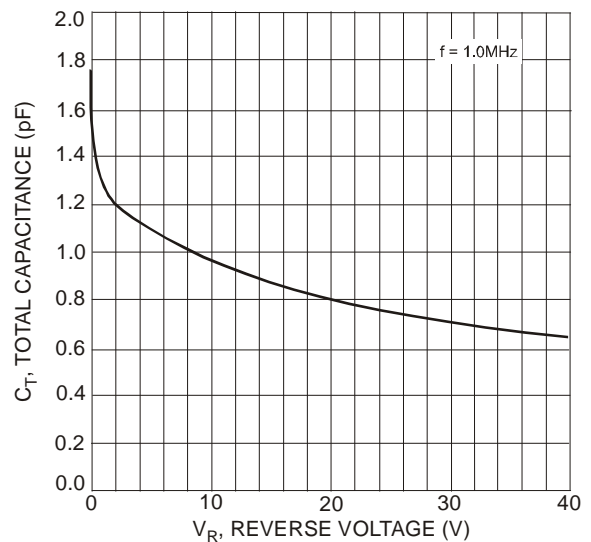
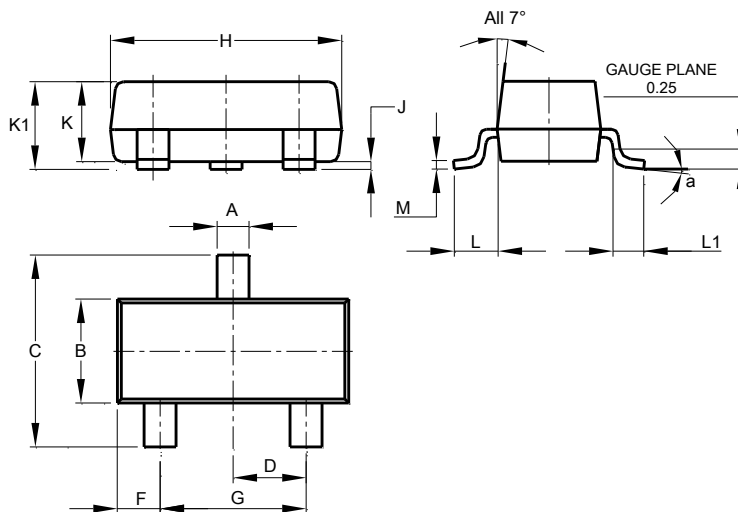


Fig. 4 Typical Capacitance vs. Reverse Voltage

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### SOT23



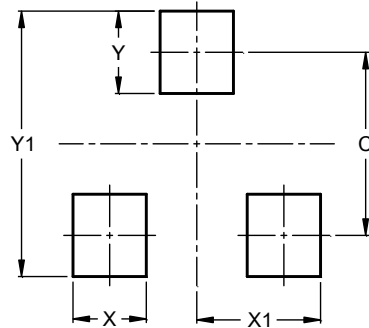
| SOT23 |       |       |       |
|-------|-------|-------|-------|
| Dim   | Min   | Max   | Typ   |
| A     | 0.37  | 0.51  | 0.40  |
| B     | 1.20  | 1.40  | 1.30  |
| C     | 2.30  | 2.50  | 2.40  |
| D     | 0.89  | 1.03  | 0.915 |
| F     | 0.45  | 0.60  | 0.535 |
| G     | 1.78  | 2.05  | 1.83  |
| H     | 2.80  | 3.00  | 2.90  |
| J     | 0.013 | 0.10  | 0.05  |
| K     | 0.890 | 1.00  | 0.975 |
| K1    | 0.903 | 1.10  | 1.025 |
| L     | 0.45  | 0.61  | 0.55  |
| L1    | 0.25  | 0.55  | 0.40  |
| M     | 0.085 | 0.150 | 0.110 |
| a     | 0°    | 8°    | --    |

All Dimensions in mm

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**



| Dimensions | Value (in mm) |
|------------|---------------|
| <b>C</b>   | 2.0           |
| <b>X</b>   | 0.8           |
| <b>X1</b>  | 1.35          |
| <b>Y</b>   | 0.9           |
| <b>Y1</b>  | 2.9           |

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