


**Features**

- Surface Mount Package Ideally Suited for Automated Insertion
- Very Low Leakage Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

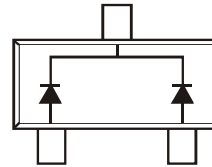
**Mechanical Data**

- Case: SOT23
- Case Material: Molded Plastic.  
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 
- Polarity: See Diagram
- Weight: 0.008 grams (Approximate)

SOT23



Top View



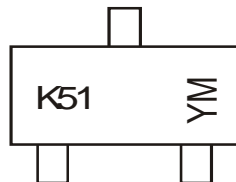
Top View  
Internal Schematic

**Ordering Information** (Note 5)

| Part Number           | Qualification | Case  | Packaging          |
|-----------------------|---------------|-------|--------------------|
| BAV170-7-F            | Commercial    | SOT23 | 3,000/Tape & Reel  |
| BAV170-13-F           | Commercial    | SOT23 | 10,000/Tape & Reel |
| BAV170Q-7-F (Note 4)  | Automotive    | SOT23 | 3,000/Tape & Reel  |
| BAV170Q-13-F (Note 4) | 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to <https://www.diodes.com/quality/>.
  5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

**Marking Information**



K51 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: F = 2018)  
 M = Month (ex: 9 = September)

Date Code Key

| Year  | 2001 | 2002 | ..... | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|-------|------|------|-------|------|------|------|------|------|------|------|------|------|
| Code  | M    | N    | ..... | 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 |
|---|--|------------------|------|
| Peak Repetitive Reverse Voltage           | V <sub>RRM</sub>                         | 85               | V    |
| Working Peak Reverse Voltage              | V <sub>RWM</sub>                         |                  |      |
| DC Blocking Voltage                       | V <sub>R</sub>                           |                  |      |
| RMS Reverse Voltage                       | V <sub>R(RMS)</sub>                      | 60               | V    |
| Forward Continuous Current (Note 6)       | Single Diode<br>Double Diode             | I <sub>FM</sub>  | 215  |
|   |  |                  | 125  |
| Repetitive Peak Forward Current           | I <sub>FRM</sub>                         | 500              | mA   |
| Non-Repetitive Peak Forward Surge Current | @ t = 1.0µs<br>@ t = 1.0ms<br>@ t = 1.0s | I <sub>FSM</sub> | 4.0  |
|   |  |                  | 1.0  |
|   |  |                  | 0.5  |

**Thermal Characteristics**

| Characteristic                                      | Symbol                            | Value       | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation (Note 6)                          | P <sub>D</sub>                    | 250         | mW   |
| Thermal Resistance Junction to Ambient Air (Note 6) | R <sub>θJA</sub>                  | 500         | °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 | Typ | Max  | Unit | Test Condition  |
|------------------------------------|--------------------|-----|-----|------|------|---|
| Reverse Breakdown Voltage (Note 7) | V <sub>(BR)R</sub> | 85  | —   | —    | V    | I <sub>R</sub> = 100µA  |
| Forward Voltage                    | V <sub>F</sub>     | —   | —   | 0.90 | V    | I <sub>F</sub> = 1.0mA  |
|                                    |                    |     |     | 1.0  |      | I <sub>F</sub> = 10mA   |
|                                    |                    |     |     | 1.1  |      | I <sub>F</sub> = 50mA   |
|                                    |                    |     |     | 1.25 |      | I <sub>F</sub> = 150mA  |
| Leakage Current (Note 7)           | I <sub>R</sub>     | —   | —   | 5.0  | nA   | V <sub>R</sub> = 75V  |
|                                    |                    |     |     | 80   |      | V <sub>R</sub> = 75V, T <sub>J</sub> = 150°C  |
| Total Capacitance                  | C <sub>T</sub>     | —   | 2   | —    | pF   | V <sub>R</sub> = 0, f = 1.0MHz  |
| Reverse Recovery Time              | t <sub>rr</sub>    | —   | —   | 3.0  | µs   | 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 FR-4 PC board with recommended pad layout, which can be found on our website at <http://www.diodes.com>.  
7. Short duration pulse test used to minimize self-heating effect.

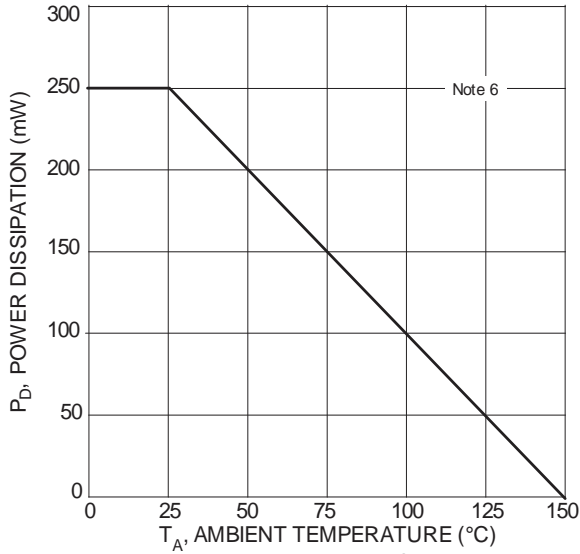


Fig. 1 Power Derating Curve

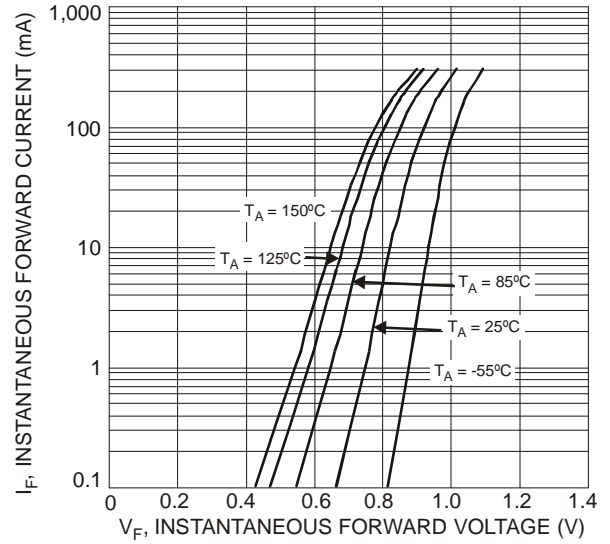


Fig. 2 Typical Forward Characteristics

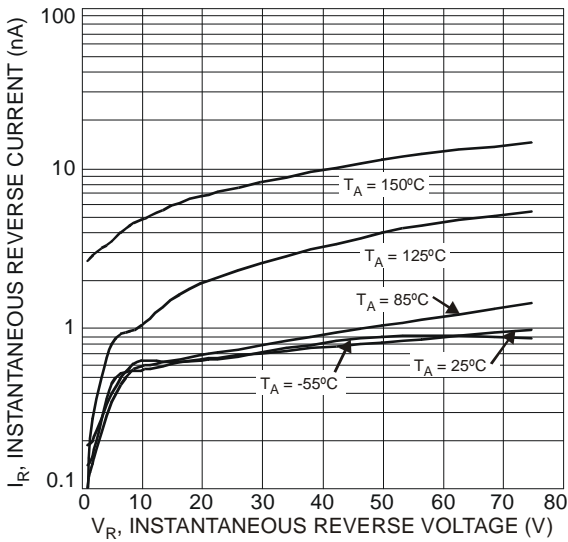


Fig. 3 Typical Reverse Characteristics

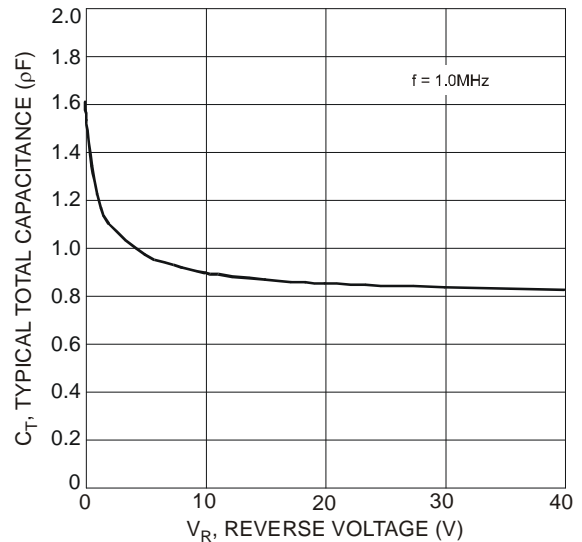
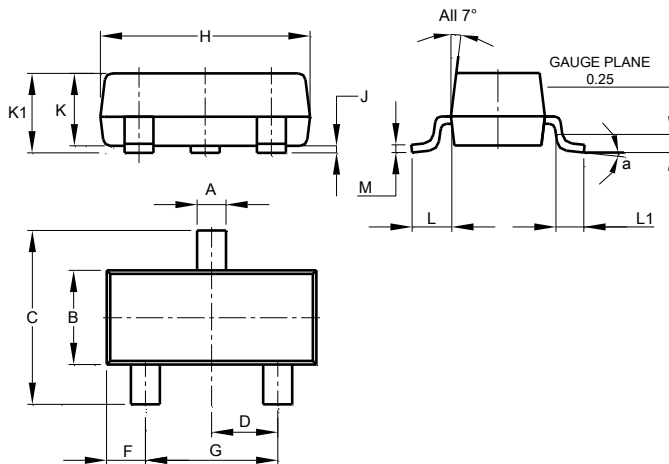


Fig. 4 Typical Capacitance vs. Reverse Voltage

**Package Outline Dimensions**

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

**SOT23**

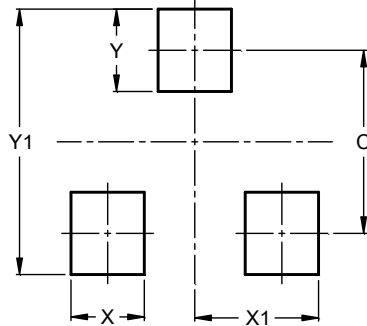


| SOT23                |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.37  | 0.51  | 0.40  |
| B                    | 1.20  | 1.40  | 1.30  |
| C                    | 2.30  | 2.50  | 2.40  |
| D                    | 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) |
|------------|---------------|
| C          | 2.0           |
| X          | 0.8           |
| X1         | 1.35          |
| Y          | 0.9           |
| Y1         | 2.9           |

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