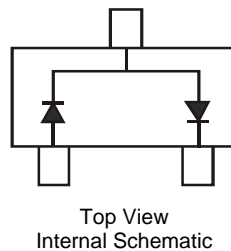


**Features**

- Fast Switching Speed: Maximum of 50ns
- High Reverse Breakdown Voltage: 300V
- Low Leakage Current: Maximum of 100nA when  $V_R = 240V$  at Room Temperature
- Surface Mount Package Ideally Suited for Automated Insertion
- For General Purpose Switching Applications
- **Qualified to AEC-Q101 Standards for High Reliability**
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

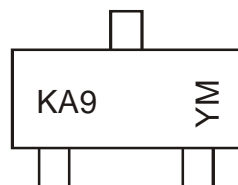
**Mechanical Data**

- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin annealed over Copper leadframe. (Lead Free Plating) Solderable per MIL-STD-202, Method 208 <sup>e3</sup>
- Polarity: See Diagram
- Weight: 0.006 grams (approximate)


**Ordering Information** (Notes 4 & 5)

| Part Number     | Qualification | Case   | Packaging        |
|-----------------|---------------|--------|------------------|
| MMBD2004SW-7-F  | Commercial    | SOT323 | 3000/Tape & Reel |
| MMBD2004SWQ-7-F | Automotive    | SOT323 | 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>.
  5. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

**Marking Information**


KA9= Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Z = 2012)  
 M = Month (ex: 9 = September)

## Date Code Key

| Year | 2003 | 2004 | ..... | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|------|------|------|-------|------|------|------|------|------|------|------|
| Code | P    | R    | ..... | Z    | A    | B    | C    | D    | E    | F    |

| 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 |
|---|---------------------|-------|------|
| Repetitive Peak Reverse Voltage           | V <sub>RRM</sub>    | 300   | V    |
| Working Peak Reverse Voltage              | V <sub>RWM</sub>    | 240   | V    |
| DC Blocking Voltage                       | V <sub>R</sub>      | 170   | V    |
| RMS Reverse Voltage                       | V <sub>R(RMS)</sub> | 170   | V    |
| Forward Continuous Current                | I <sub>F</sub>      | 225   | mA   |
| Peak Repetitive Forward Current           | I <sub>FRM</sub>    | 625   | mA   |
| Non-Repetitive Peak Forward Surge Current | I <sub>FSM</sub>    | 4.0   | A    |
|   |                     | 1.0   | A    |

**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 | Max         | Unit     | Test Condition  |
|------------------------------------|--------------------|-----|-------------|----------|---|
| Reverse Breakdown Voltage (Note 7) | V <sub>(BR)R</sub> | 300 | —           | V        | I <sub>R</sub> = 100μA  |
| Forward Voltage                    | V <sub>F</sub>     | —   | 0.87<br>1.0 | V        | I <sub>F</sub> = 20mA<br>I <sub>F</sub> = 100mA   |
| Peak Reverse Current (Note 7)      | I <sub>R</sub>     | —   | 100         | nA<br>μA | V <sub>R</sub> = 240V<br>V <sub>R</sub> = 240V, T <sub>J</sub> = +150°C                   |
| Total Capacitance, per Element     | C <sub>T</sub>     | —   | 5.0         | pF       | V <sub>R</sub> = 0, f = 1.0MHz  |
| Reverse Recovery Time              | t <sub>rr</sub>    | —   | 50          | ns       | I <sub>F</sub> = I <sub>R</sub> = 30mA,<br>I <sub>rr</sub> = 3.0mA, 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.

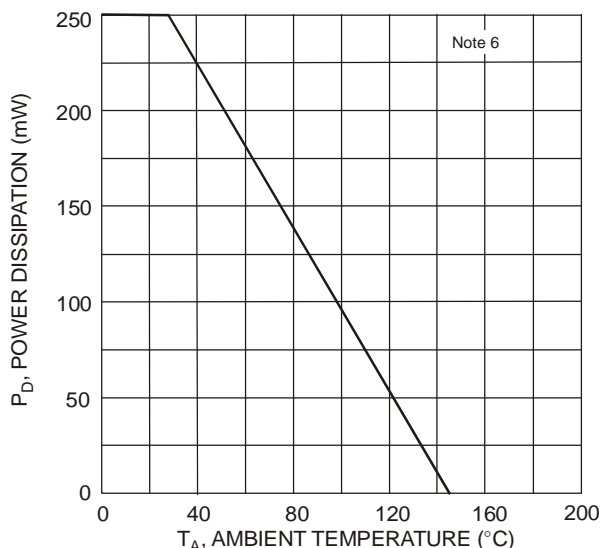


Figure 1 Power Derating Curve, Total Package

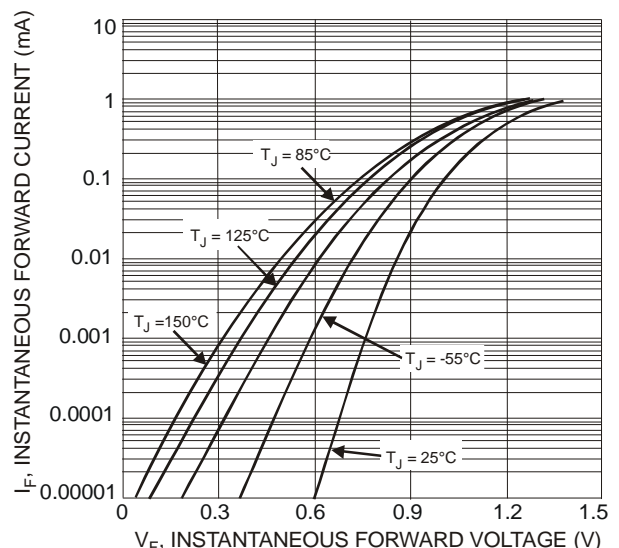


Figure 2 Typical Forward Characteristics, Per Element

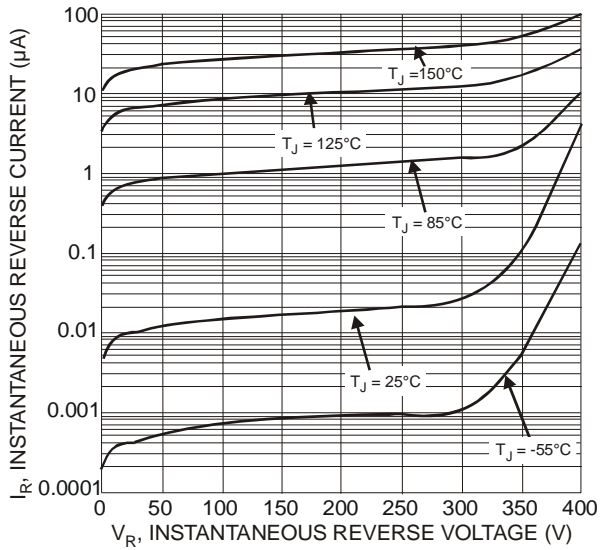


Figure 3 Typical Reverse Characteristics, Per Element

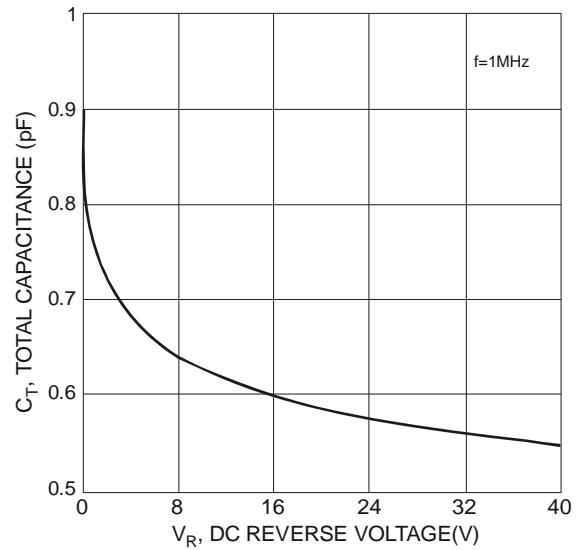
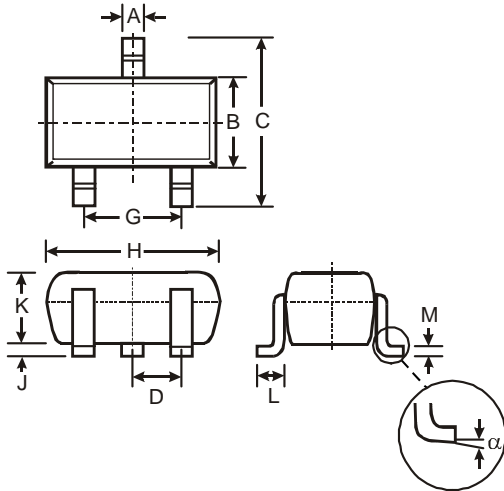


Figure 4 Total Capacitance vs. Reverse Voltage, Per Element

### Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

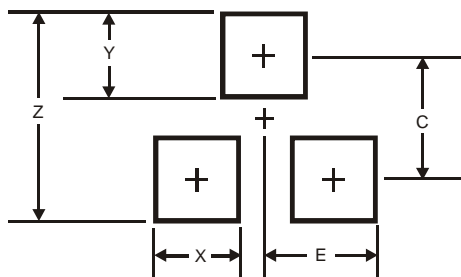


| SOT323 |      |      |      |
|--------|------|------|------|
| Dim    | Min  | Max  | Typ  |
| A      | 0.25 | 0.40 | 0.30 |
| B      | 1.15 | 1.35 | 1.30 |
| C      | 2.00 | 2.20 | 2.10 |
| D      | -    | -    | 0.65 |
| G      | 1.20 | 1.40 | 1.30 |
| H      | 1.80 | 2.20 | 2.15 |
| J      | 0.0  | 0.10 | 0.05 |
| K      | 0.90 | 1.00 | 1.00 |
| L      | 0.25 | 0.40 | 0.30 |
| M      | 0.10 | 0.18 | 0.11 |
| α      | 0°   | 8°   | -    |

All Dimensions in mm

### Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.8           |
| X          | 0.7           |
| Y          | 0.9           |
| C          | 1.9           |
| E          | 1.0           |

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