

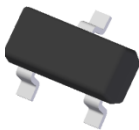
Features

- Fast Switching Speed: Maximum of 50ns
- High Reverse Breakdown Voltage Rating: 350V
- Low Reverse Current: Maximum of 100nA when $V_R = 240V$ at Room Temperature
- Surface Mount Package Ideally Suited for Automated Insertion
- **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)**

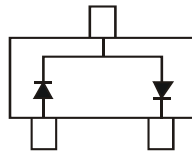
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "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)

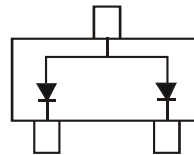
SOT23



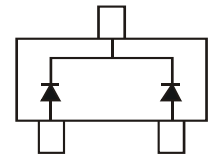
Top View



MMBD3004S Marking: KAE



MMBD3004A Marking: KAD



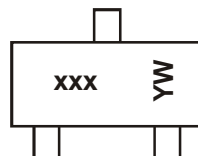
MMBD3004C Marking: KAC

Ordering Information (Note 5)

| Part Number | Qualification | Case | Packaging |
|-----------------|---------------|-------|--------------------|
| MMBD3004S-7-F | AEC-Q101 | SOT23 | 3,000/Tape & Reel |
| MMBD3004SQ-7-F | Automotive | SOT23 | 3,000/Tape & Reel |
| MMBD3004SQ-13-F | Automotive | SOT23 | 10,000/Tape & Reel |
| MMBD3004S-13-F | AEC-Q101 | SOT23 | 10,000/Tape & Reel |
| MMBD3004A-7-F | AEC-Q101 | SOT23 | 3,000/Tape & Reel |
| MMBD3004C-7-F | AEC-Q101 | SOT23 | 3,000/Tape & Reel |
| MMBD3004CQ-7-F | Automotive | SOT23 | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html 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 http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



xxx = Product Type Marking Code
 KAE = MMBD3004S
 KAD = MMBD3004A
 KAC = MMBD3004C
 YM = Date Code Marking
 Y = Year (ex: Z = 2012)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2006 | 2007 | 2008 | 2009 | ... | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|-------|------|------|------|------|-----|------|------|------|------|------|------|------|
| Code | T | U | V | W | ... | 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_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--|------------------------------------|------------|------|
| Repetitive Peak Reverse Voltage | V _{RRM} | 350 | V |
| Working Peak Reverse Voltage DC Blocking Voltage | V _{RWM} V _R | 300 | V |
| RMS Reverse Voltage | V _{R(RMS)} | 212 | V |
| Forward Continuous Current (Note 6) | I _F | 225 | mA |
| Peak Repetitive Forward Current (Note 6) | I _{FRM} | 625 | mA |
| Non-Repetitive Peak Forward Surge Current @ t = 1.0μs @ t = 1.0s | I _{FSM} | 4.0 1.0 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation (Note 6) | P _D | 350 | mW |
| Thermal Resistance Junction to Ambient Air (Note 6) | R _{θJA} | 357 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -65 to +150 | °C |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------------|--------------------|-----|----------------------|---------------------|----------|---|
| Reverse Breakdown Voltage (Note 7) | V _{(BR)R} | 350 | — | — | V | I _R = 150μA |
| Forward Voltage | V _F | — | 0.78 0.93 1.03 | 0.87 1.0 1.25 | V | I _F = 20mA I _F = 100mA I _F = 200mA |
| Reverse Current (Note 7) | I _R | — | 30 35 | 100 100 | nA μA | V _R = 240V V _R = 240V, T _J = +150°C |
| Total Capacitance | C _T | — | 1.0 | 5.0 | pF | V _R = 0V, f = 1.0MHz |
| Reverse Recovery Time | t _{RR} | — | — | 50 | ns | I _F = I _R = 30mA, I _{RR} = 3.0mA, R _L = 100Ω |

Notes: 6. Part mounted on FR-4 substrate with pad dimensions 1 inch x 1 inch, 2oz, copper, single-sided, PC board.
7. Short duration pulse test used to minimize self-heating effect.

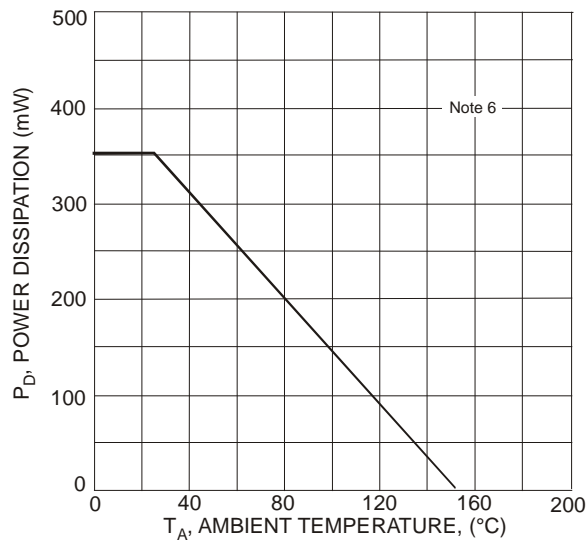


Figure 1 Power Derating Curve, Total Package

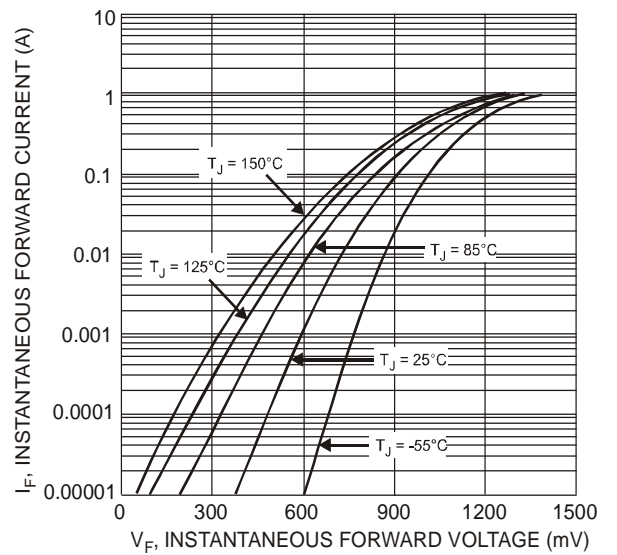


Figure 2 Typical Forward Characteristics, Per Element

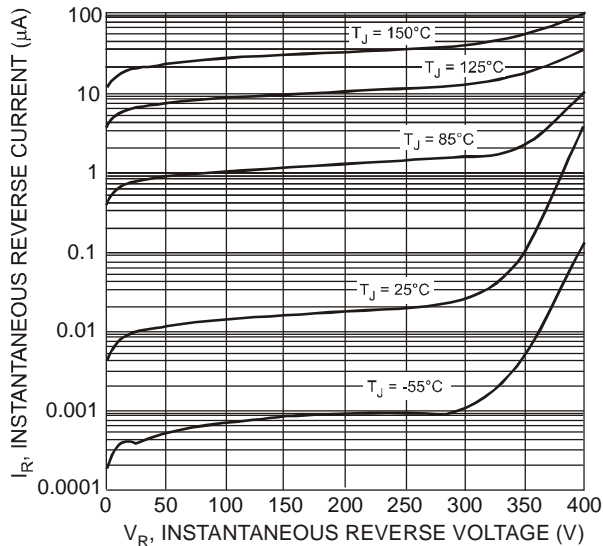


Figure 3 Typical Reverse Characteristics, Per Element

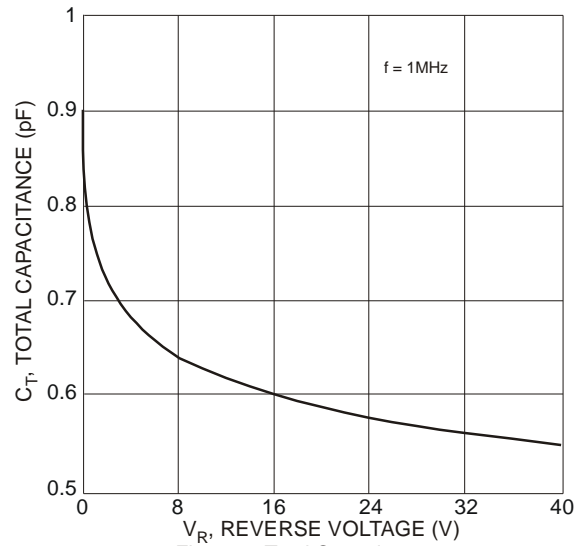
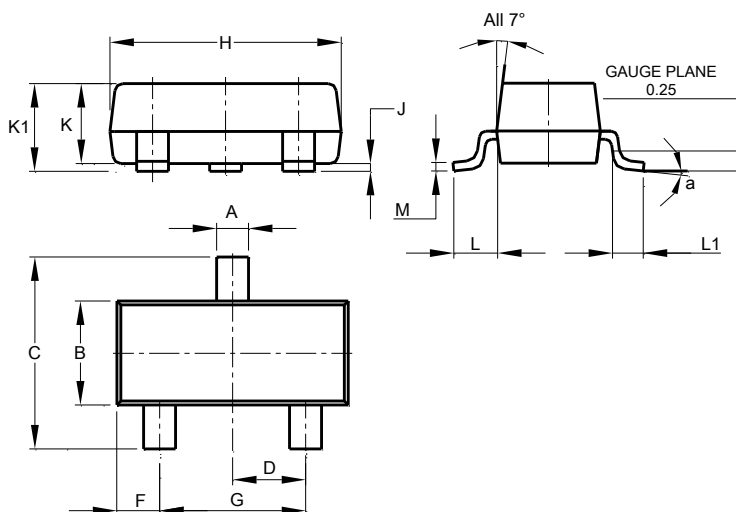


Figure 4 Total Capacitance vs. Reverse Voltage, Per Element

Package Outline Dimensions

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

SOT23

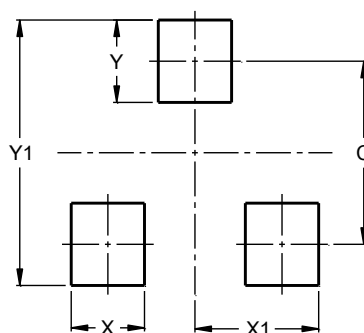


| SOT23 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.37 | 0.51 | 0.40 |
| B | 1.20 | 1.40 | 1.30 |
| C | 2.30 | 2.50 | 2.40 |
| D | 0.89 | 1.03 | 0.915 |
| F | 0.45 | 0.60 | 0.535 |
| G | 1.78 | 2.05 | 1.83 |
| H | 2.80 | 3.00 | 2.90 |
| J | 0.013 | 0.10 | 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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