

## Features

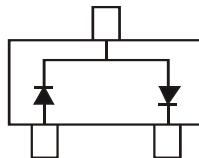
- Fast Switching Speed: 50ns
- Surface Mount Package Ideally Suited for Automated Insertion
- High Reverse Breakdown Voltage Rating: 400V
- **Lead Free by Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

## 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: Finish - Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Polarity: See Diagram
- Weight: 0.008 grams (approximate)



Top View

Top View  
Internal Schematic

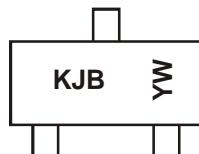
## Ordering Information (Note 3)

| Part Number | Case  | Packaging        |
|-------------|-------|------------------|
| MMBD5004S-7 | SOT23 | 3000/Tape & Reel |

Notes:

1. No purposefully added lead.
2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
3. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



KJB = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Y = 2011)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year  | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |     |     |     |     |
|-------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|
| Code  | X    | Y    | Z    | A    | B    | C    | D    | E    |     |     |     |     |
| 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** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic  | Symbol              | Value | Unit |
|---|---------------------|-------|------|
| Repetitive Peak Reverse Voltage                                     | $V_{RRM}$           | 400   | V    |
| Working Peak Reverse Voltage  | $V_{RWM}$           | 350   | V    |
| DC Blocking Voltage   | $V_R$               |       |      |
| RMS Reverse Voltage   | $V_{R(\text{RMS})}$ | 247   | V    |
| Forward Continuous Current (Note 4)                                 | $I_F$               | 300   | mA   |
| Peak Repetitive Forward Current (Note 4)                            | $I_{FRM}$           | 625   | mA   |
| Non-Repetitive Peak Forward Surge Current<br>@ $t = 1.0\mu\text{s}$ | $I_{FSM}$           | 5     | A    |
| Non-Repetitive Peak Forward Surge Current<br>@ $t = 1.0\text{ms}$   |                     | 3     |      |

**Thermal Characteristics**

| Characteristic                                      | Symbol          | Value       | Unit |
|---|-----------------|-------------|------|
| Power Dissipation (Note 4) (See figure 1)           | $P_D$           | 350         | mW   |
| Thermal Resistance Junction to Ambient Air (Note 4) | $R_{\theta JA}$ | 357         | °C/W |
| Operating and Storage Temperature Range             | $T_J, T_{STG}$  | -55 to +150 | °C   |

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic                     | Symbol      | Min | Typ  | Max                  | Unit     | Test Condition  |
|------------------------------------|-------------|-----|------|----------------------|----------|---|
| Reverse Breakdown Voltage (Note 5) | $V_{(BR)R}$ | 400 | —    | —                    | V        | $I_R = 150\mu\text{A}$  |
| Forward Voltage                    | $V_F$       | —   | —    | 0.9<br>1.05<br>1.275 | V        | $I_F = 20\text{mA}$<br>$I_F = 100\text{mA}$<br>$I_F = 200\text{mA}$     |
| Reverse Current (Note 5)           | $I_R$       | —   | —    | 150<br>5             | nA<br>μA | $V_R = 240\text{V}$<br>$V_R = 360\text{V}$                              |
| Total Capacitance                  | $C_T$       | —   | 0.65 | 2.0                  | pF       | $V_R = 0\text{V}, f = 1.0\text{MHz}$                                    |
| Reverse Recovery Time              | $t_{rr}$    | —   | —    | 50                   | ns       | $I_F = I_R = 30\text{mA}$ ,<br>$I_{rr} = 3.0\text{mA}, R_L = 100\Omega$ |

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

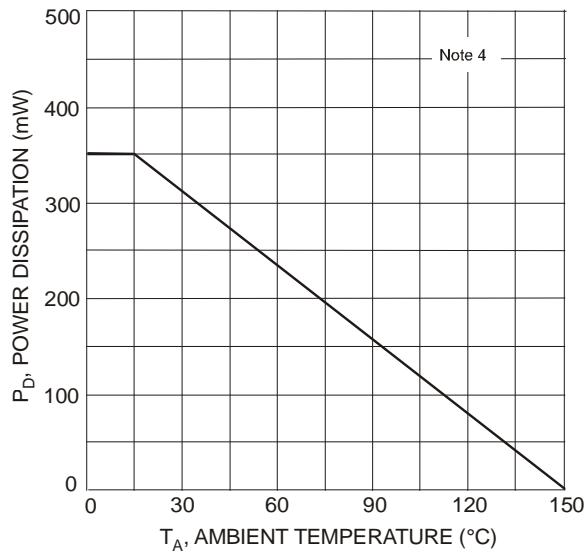


Fig. 1 Power Derating Curve, Total Package

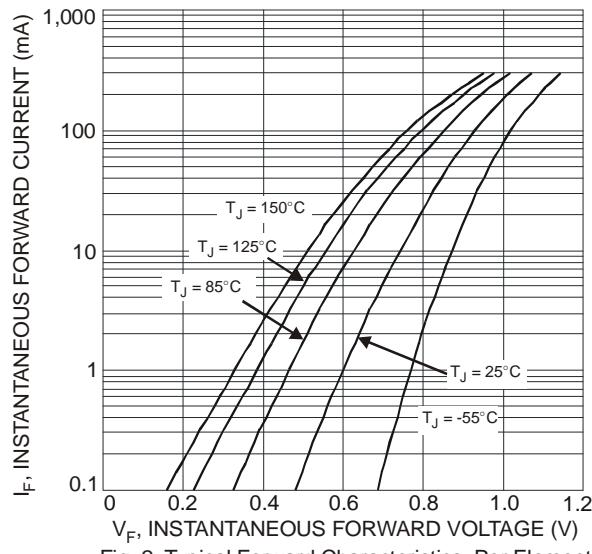


Fig. 2 Typical Forward Characteristics, Per Element

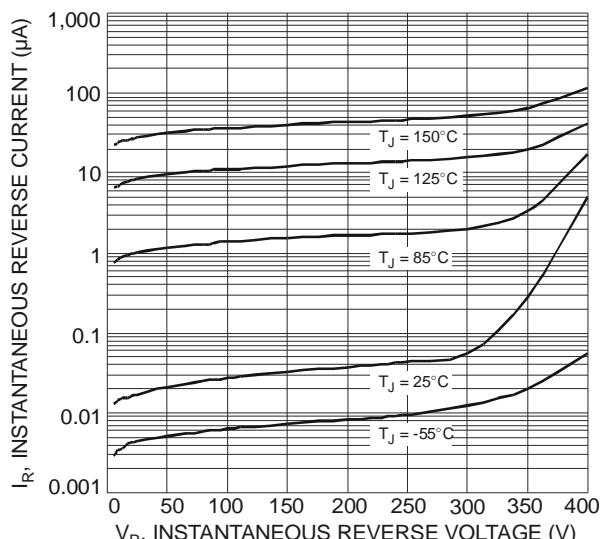
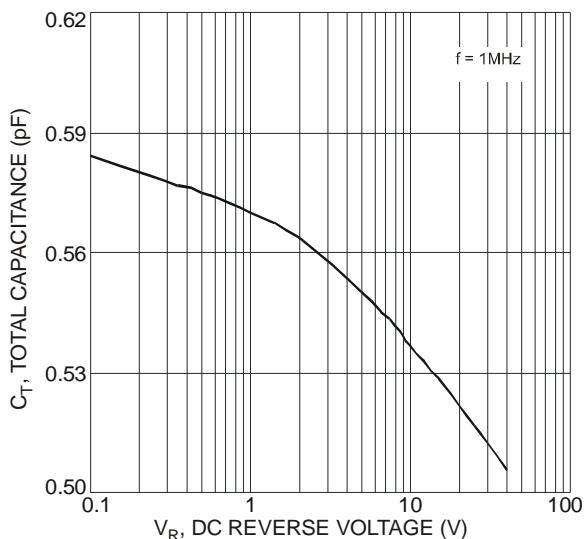
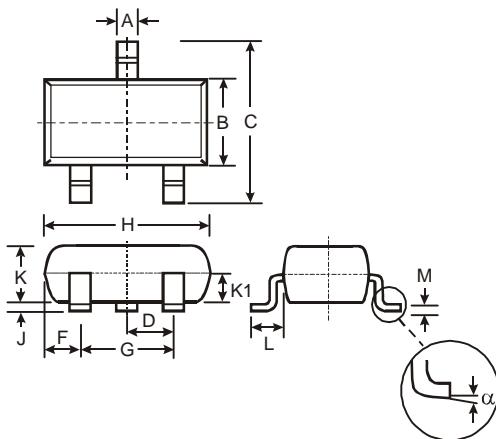


Fig. 3 Typical Reverse Characteristics, Per Element

Fig. 4 Total Capacitance  
vs. Reverse Voltage, Per Element

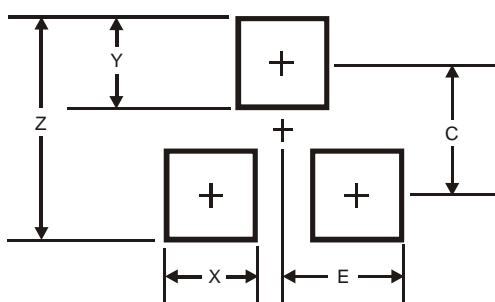
## Package Outline Dimensions



| 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  |
| $\alpha$ | 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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