

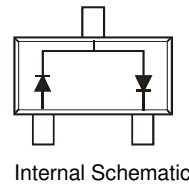
## HIGH VOLTAGE SURFACE MOUNT DUAL SWITCHING DIODE

### 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
- Dual Series Configuration
- **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**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([MMBD2004SQ](#))**

### 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: Solderable per MIL-STD-202, Method 208
- Lead-Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe)
- Polarity: See Diagram
- Weight: 0.008 grams (Approximate)

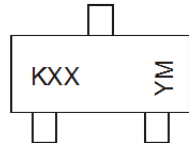


### Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
MMBD2004S-7-F	Commercial	SOT23	3000/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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

### Marking Information



KXX = Product Type Marking Code (KA9 or KAE)  
 YM = Date Code Marking  
 Y = Year (ex: G = 2019)  
 M = Month (ex: 9 = September)

#### Date Code Key

<b>Year</b>	2001	2002	2003	.....	2019	2020	2021	2022	2023	2024	2025	2026
<b>Code</b>	M	N	P	.....	G	H	I	J	K	L	M	N
<b>Month</b>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Code</b>	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 DC Blocking Voltage	V <sub>RWM</sub> V <sub>R</sub>	240	V
RMS Reverse Voltage	V <sub>R(RMS)</sub>	170	V
Forward Continuous Current (Note 5)	I <sub>FM</sub>	225	mA
Peak Repetitive Forward Current (Note 5)	I <sub>FRM</sub>	625	mA
Non-Repetitive Peak Forward Surge Current	I <sub>FSM</sub>	4.0 1.0	A
	@ t = 1.0μs @ t = 1.0s		

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	350	mW
Thermal Resistance Junction to Ambient Air (Note 5)	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 6)	V <sub>(BR)R</sub>	300	—	V	I <sub>R</sub> = 100μA
Forward Voltage	V <sub>F</sub>	—	0.87 1.0	V	I <sub>F</sub> = 20mA I <sub>F</sub> = 100mA
Reverse Current (Note 6)	I <sub>R</sub>	—	100	nA μA	V <sub>R</sub> = 240V V <sub>R</sub> = 240V, T <sub>J</sub> = +150°C
Total Capacitance	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, I <sub>RR</sub> = 3.0mA, R <sub>L</sub> = 100Ω

Notes: 5. Part mounted on FR-4 substrate with pad dimensions 1 inch × 1 inch, 2oz copper, single-sided PC board.  
6. Short duration pulse test used to minimize self-heating effect.

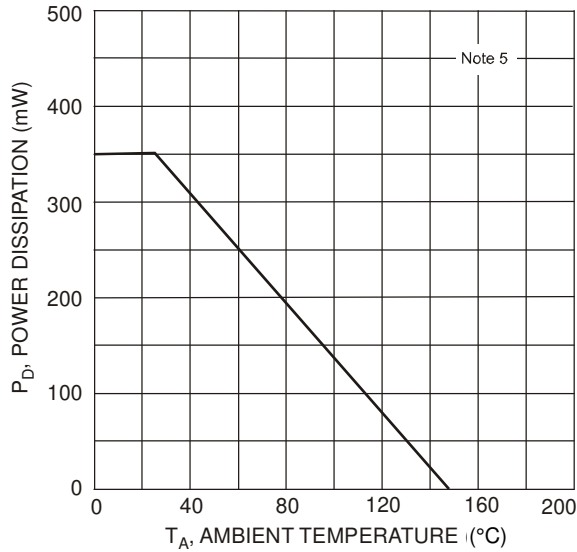


Figure 1 Power Derating Curve, Total Package

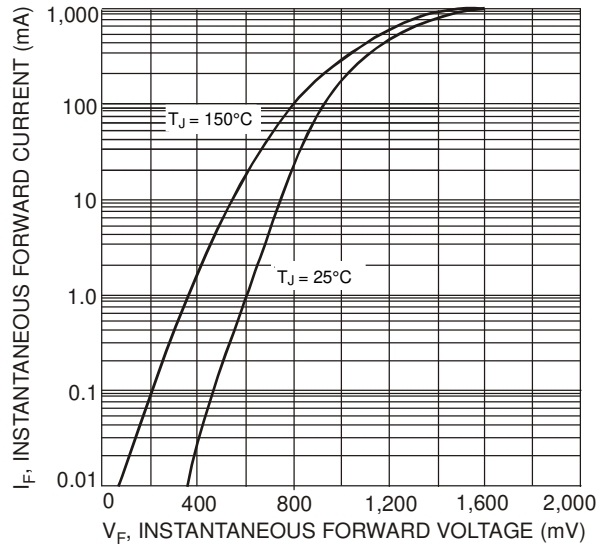


Figure 2 Typical Forward Characteristics, Per Element

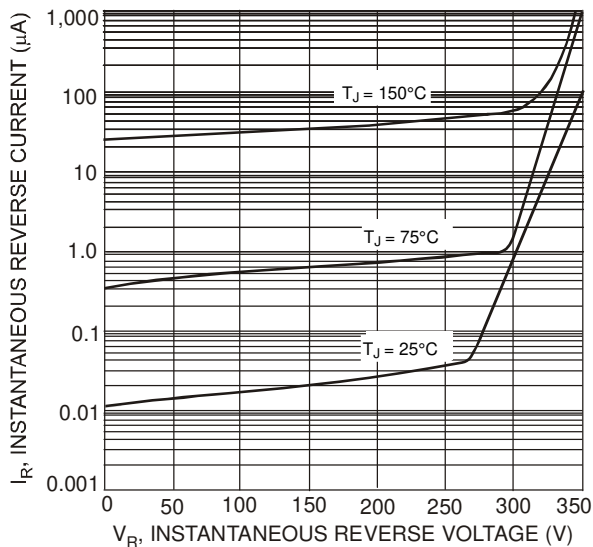


Figure 3 Typical Reverse Characteristics, Per Element

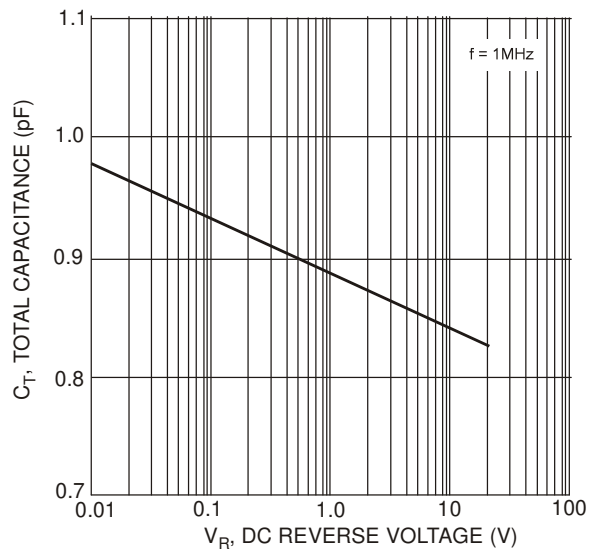
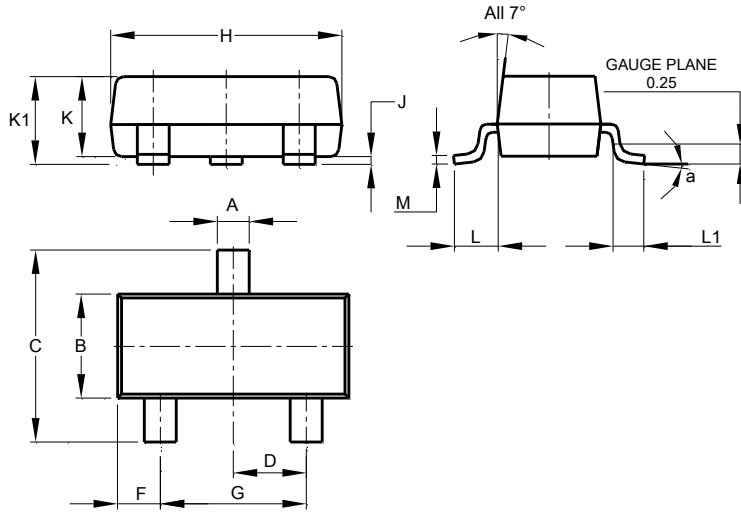


Figure 4 Total Capacitance vs. Reverse Voltage Per Element

**Package Outline Dimensions**

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

**SOT23**

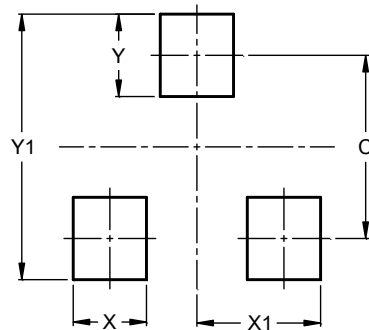


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
<b>All Dimensions in mm</b>			

**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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