

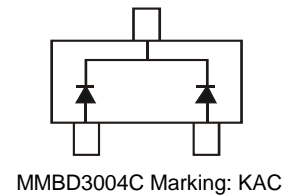
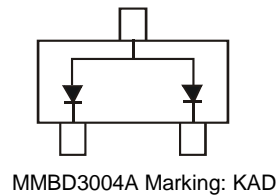
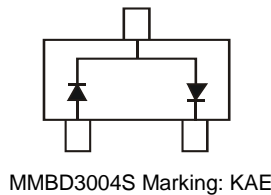
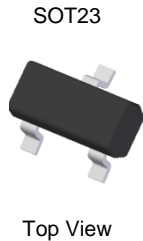
**HIGH VOLTAGE SURFACE MOUNT DUAL SWITCHING DIODE**

**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)

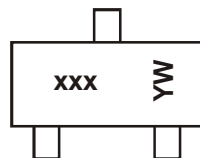


**Ordering Information (Note 5)**

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](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-Q10x qualified and are PPAP capable. Automotive, AEC-Q10x 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/](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** (@ $T_A = +25^\circ\text{C}$ , 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 @ $t = 1.0\mu\text{s}$ @ $t = 1.0\text{s}$	$I_{FSM}$	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)	$R_{\theta JA}$	357	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ\text{C}$

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	$V_{(BR)R}$	350	—	—	V	$I_R = 150\mu\text{A}$
Forward Voltage	$V_F$	—	0.78 0.93 1.03	0.87 1.0 1.25	V	$I_F = 20\text{mA}$ $I_F = 100\text{mA}$ $I_F = 200\text{mA}$
Reverse Current (Note 7)	$I_R$	—	30 35	100 100	nA $\mu\text{A}$	$V_R = 240\text{V}$ $V_R = 240\text{V}, T_J = +150^\circ\text{C}$
Total Capacitance	$C_T$	—	1.0	5.0	pF	$V_R = 0\text{V}, f = 1.0\text{MHz}$
Reverse Recovery Time	$t_{RR}$	—	—	50	ns	$I_F = I_R = 30\text{mA}$ , $I_{RR} = 3.0\text{mA}, R_L = 100\Omega$

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.

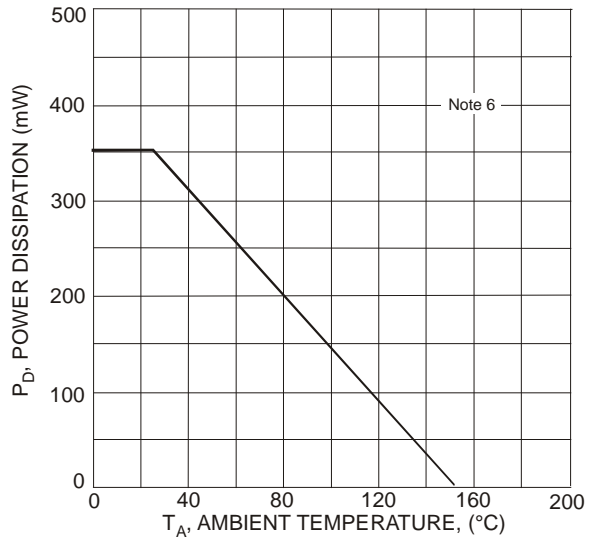


Figure 1 Power Derating Curve, Total Package

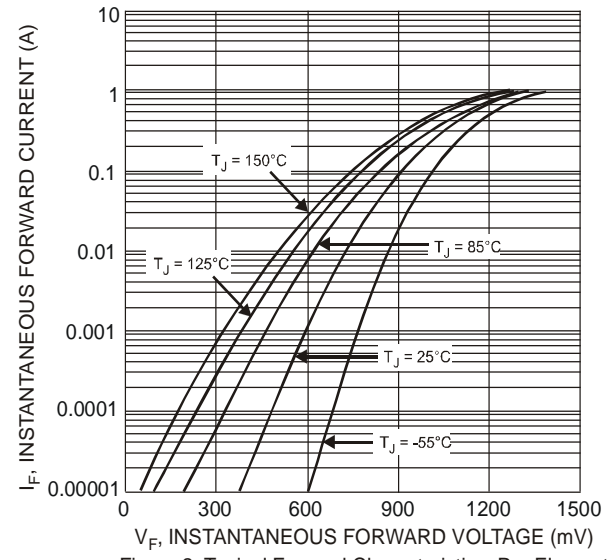


Figure 2 Typical Forward Characteristics, Per Element

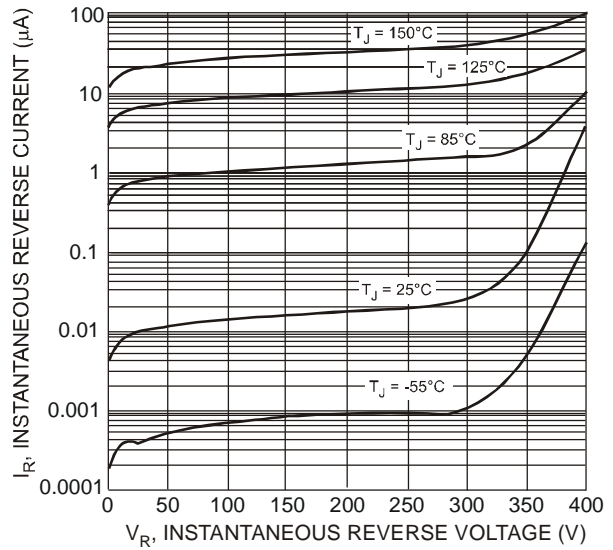


Figure 3 Typical Reverse Characteristics, Per Element

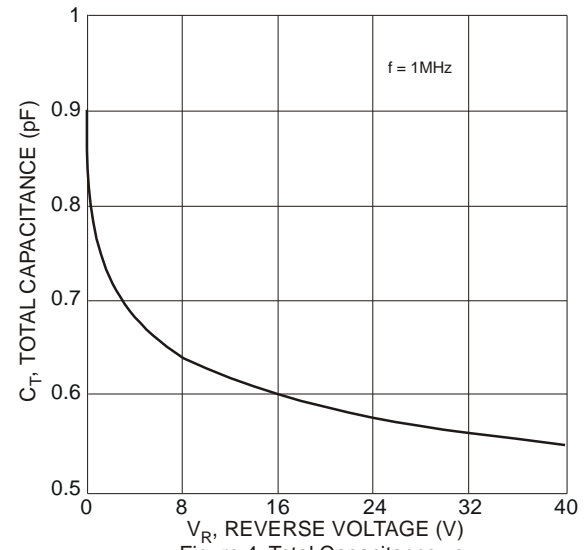
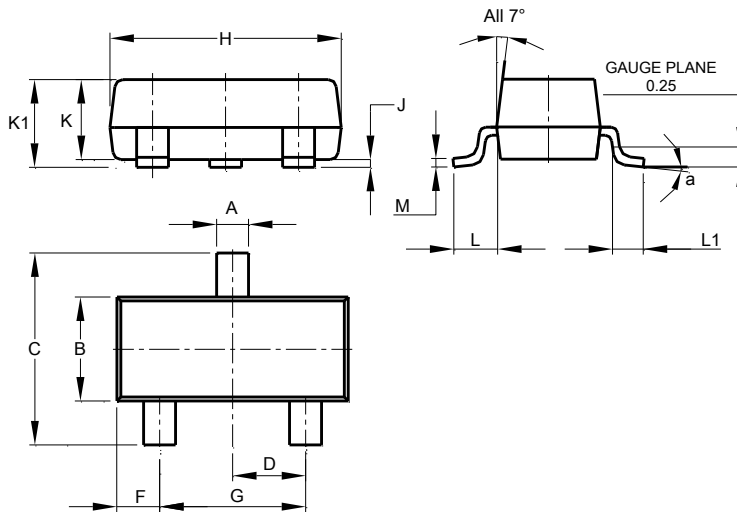


Figure 4 Total Capacitance vs. Reverse Voltage, Per Element

**Package Outline Dimensions**

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

**SOT23**

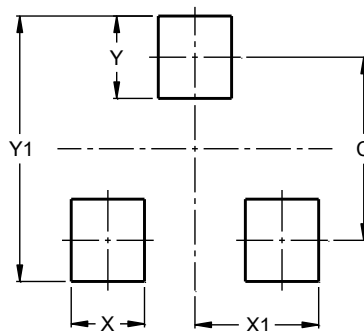


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	-
All Dimensions in mm			

**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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