

## SMBJ5.0(C)A - SMBJ200A

### 600W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

### **Features**

- 600W Peak Pulse Power Dissipation
- 5.0V to 200V Standoff Voltages
- Glass Passivated Die Construction
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

# **Mechanical Data**

Case: SMB

Case Material: Molded Plastic.
 UL Flammability Classification Rating 94V-0

• Moisture Sensitivity: Level 1 per J-STD-020

Terminals: Lead Free Plating (Matte Tin Finish).
 Solderable per MIL-STD-202, Method 208 (3)

Weight: 0.1 grams (Approximate)



Top View



**Bottom View** 

### Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
SMBJXXX(C)A-13-F	Commercial	SMB	3,000/Tape & Reel

x = Device Voltage, e.g., SMBJ170A-13-F.

Notes:

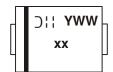
- 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
- See http://www.diodes.com/quality/lead\_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- 4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/

# **Marking Information**

**Bi-Directional Device** 

Cathode Band for Uni-Directional Device







# **Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Peak Pulse Power Dissipation	P <sub>PK</sub>	600	W
(Non Repetitive Current Pulse Derated above $T_A = +25^{\circ}C$ ) (Note 5)	r PK		
Peak Power Derating Above +25°C	P <sub>DER</sub>	4.8	W/°C
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed	I <sub>FSM</sub>	100	А
on Rated Load (Notes 5, 6 & 7)			
Steady State Power Dissipation @ T <sub>L</sub> = +75°C	PM <sub>(AV)</sub>	5.0	W
Instantaneous Forward Voltage @ I <sub>PP</sub> = 35A V <sub>BR</sub> <100V	V	3.5	V
(Notes 5, 6 & 7) V <sub>BR≥</sub> 100V	V <sub>F</sub> 5.0 V		V

## **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Operating Temperature Range	TJ	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +175	°C

Notes:

<sup>5.</sup> Valid provided that terminals are kept at ambient temperature.
6. Measured with 8.3ms single half sine-wave. Duty cycle = 4 pulses per minute maximum.
7. Unidirectional units only.

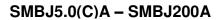


# Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

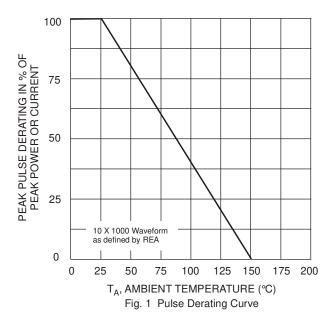
See Note 6         V <sub>RWM</sub> (V)         Min (V)         Max (V)         I <sub>T</sub> (mA)         I <sub>R</sub> (μA)         V <sub>C</sub> (V)         (A)         BI           SMBJ5.0(C)A         5.0         6.40         7.23         10         800         9.2         65.2         AE           SMBJ6.0(C)A         6.0         6.67         7.67         10         800         10.3         58.3         AC           SMBJ6.5(C)A         6.5         7.22         8.30         10         500         11.2         53.6         AF           SMBJ7.0(C)A         7.0         7.78         8.95         10         200         12.0         50.0         AN           SMBJ7.5(C)A         7.5         8.33         9.58         1.0         100         12.9         46.5         AF           SMBJ8.0(C)A         8.0         8.89         10.23         1.0         50         13.6         44.1         AF           SMBJ8.5(C)A         8.5         9.44         10.82         1.0         10         14.4         41.7         AT           SMBJ9.0(C)A         9.0         10.00         11.50         1.0         5.0         15.4         39.0         AV           SMBJ11(C)A	KE KG KK KM KP KR KT KV KX KZ
SMBJ5.0(C)A         5.0         6.40         7.23         10         800         9.2         65.2         AE           SMBJ6.0(C)A         6.0         6.67         7.67         10         800         10.3         58.3         AC           SMBJ6.5(C)A         6.5         7.22         8.30         10         500         11.2         53.6         AF           SMBJ7.0(C)A         7.0         7.78         8.95         10         200         12.0         50.0         AN           SMBJ7.5(C)A         7.5         8.33         9.58         1.0         100         12.9         46.5         AF           SMBJ8.0(C)A         8.0         8.89         10.23         1.0         50         13.6         44.1         AF           SMBJ8.5(C)A         8.5         9.44         10.82         1.0         10         14.4         41.7         AT           SMBJ9.0(C)A         9.0         10.00         11.50         1.0         5.0         15.4         39.0         AV           SMBJ11(C)A         11.0         12.20         14.40         1.0         5.0         17.0         35.3         AV           SMBJ13(C)A         13.0         14.	KG KK KM KP KR KT KV KX
SMBJ6.0(C)A         6.0         6.67         7.67         10         800         10.3         58.3         AC           SMBJ6.5(C)A         6.5         7.22         8.30         10         500         11.2         53.6         Ak           SMBJ7.0(C)A         7.0         7.78         8.95         10         200         12.0         50.0         Ak           SMBJ7.5(C)A         7.5         8.33         9.58         1.0         100         12.9         46.5         AF           SMBJ8.0(C)A         8.0         8.89         10.23         1.0         50         13.6         44.1         AF           SMBJ8.5(C)A         8.5         9.44         10.82         1.0         10         14.4         41.7         AT           SMBJ9.0(C)A         9.0         10.00         11.50         1.0         5.0         15.4         39.0         AV           SMBJ10(C)A         10.0         11.10         12.80         1.0         5.0         17.0         35.3         AV           SMBJ12(C)A         12.0         13.30         15.30         1.0         5.0         19.9         30.2         BE           SMBJ13(C)A         13.0 <td< td=""><td>KK KM KP KR KT KV KX</td></td<>	KK KM KP KR KT KV KX
SMBJ6.5(C)A         6.5         7.22         8.30         10         500         11.2         53.6         AP           SMBJ7.0(C)A         7.0         7.78         8.95         10         200         12.0         50.0         AN           SMBJ7.5(C)A         7.5         8.33         9.58         1.0         100         12.9         46.5         AF           SMBJ8.0(C)A         8.0         8.89         10.23         1.0         50         13.6         44.1         AF           SMBJ8.5(C)A         8.5         9.44         10.82         1.0         10         14.4         41.7         AT           SMBJ9.0(C)A         9.0         10.00         11.50         1.0         5.0         15.4         39.0         AV           SMBJ10(C)A         10.0         11.10         12.80         1.0         5.0         17.0         35.3         AV           SMBJ11(C)A         11.0         12.20         14.40         1.0         5.0         18.2         33.0         AZ           SMBJ13(C)A         13.0         14.40         16.50         1.0         5.0         21.5         27.9         BG           SMBJ14(C)A         14.0	KM KP KR KT KV KX
SMBJ7.5(C)A         7.5         8.33         9.58         1.0         100         12.9         46.5         AF           SMBJ8.0(C)A         8.0         8.89         10.23         1.0         50         13.6         44.1         AF           SMBJ8.5(C)A         8.5         9.44         10.82         1.0         10         14.4         41.7         AT           SMBJ9.0(C)A         9.0         10.00         11.50         1.0         5.0         15.4         39.0         AV           SMBJ10(C)A         10.0         11.10         12.80         1.0         5.0         17.0         35.3         AV           SMBJ11(C)A         11.0         12.20         14.40         1.0         5.0         18.2         33.0         AZ           SMBJ13(C)A         13.0         14.40         16.50         1.0         5.0         21.5         27.9         BC           SMBJ14(C)A         14.0         15.60         17.90         1.0         5.0         23.2         25.8         BF	KP KR KT KV KX
SMBJ7.5(C)A         7.5         8.33         9.58         1.0         100         12.9         46.5         AF           SMBJ8.0(C)A         8.0         8.89         10.23         1.0         50         13.6         44.1         AF           SMBJ8.5(C)A         8.5         9.44         10.82         1.0         10         14.4         41.7         AT           SMBJ9.0(C)A         9.0         10.00         11.50         1.0         5.0         15.4         39.0         AV           SMBJ10(C)A         10.0         11.10         12.80         1.0         5.0         17.0         35.3         AX           SMBJ11(C)A         11.0         12.20         14.40         1.0         5.0         18.2         33.0         AZ           SMBJ13(C)A         13.0         14.40         16.50         1.0         5.0         21.5         27.9         BC           SMBJ14(C)A         14.0         15.60         17.90         1.0         5.0         23.2         25.8         BF	KR KT KV KX
SMBJ8.0(C)A         8.0         8.89         10.23         1.0         50         13.6         44.1         AF           SMBJ8.5(C)A         8.5         9.44         10.82         1.0         10         14.4         41.7         AT           SMBJ9.0(C)A         9.0         10.00         11.50         1.0         5.0         15.4         39.0         AV           SMBJ10(C)A         10.0         11.10         12.80         1.0         5.0         17.0         35.3         AV           SMBJ11(C)A         11.0         12.20         14.40         1.0         5.0         18.2         33.0         AZ           SMBJ12(C)A         12.0         13.30         15.30         1.0         5.0         19.9         30.2         BE           SMBJ13(C)A         13.0         14.40         16.50         1.0         5.0         21.5         27.9         BC           SMBJ14(C)A         14.0         15.60         17.90         1.0         5.0         23.2         25.8         BF	KT KV KX KZ
SMBJ8.5(C)A         8.5         9.44         10.82         1.0         10         14.4         41.7         AT           SMBJ9.0(C)A         9.0         10.00         11.50         1.0         5.0         15.4         39.0         AV           SMBJ10(C)A         10.0         11.10         12.80         1.0         5.0         17.0         35.3         AV           SMBJ11(C)A         11.0         12.20         14.40         1.0         5.0         18.2         33.0         AZ           SMBJ12(C)A         12.0         13.30         15.30         1.0         5.0         19.9         30.2         BE           SMBJ13(C)A         13.0         14.40         16.50         1.0         5.0         21.5         27.9         BC           SMBJ14(C)A         14.0         15.60         17.90         1.0         5.0         23.2         25.8         BF	KV KX KZ
SMBJ9.0(C)A         9.0         10.00         11.50         1.0         5.0         15.4         39.0         AV           SMBJ10(C)A         10.0         11.10         12.80         1.0         5.0         17.0         35.3         AV           SMBJ11(C)A         11.0         12.20         14.40         1.0         5.0         18.2         33.0         AZ           SMBJ12(C)A         12.0         13.30         15.30         1.0         5.0         19.9         30.2         BE           SMBJ13(C)A         13.0         14.40         16.50         1.0         5.0         21.5         27.9         BC           SMBJ14(C)A         14.0         15.60         17.90         1.0         5.0         23.2         25.8         BH	KX KZ
SMBJ10(C)A         10.0         11.10         12.80         1.0         5.0         17.0         35.3         AX           SMBJ11(C)A         11.0         12.20         14.40         1.0         5.0         18.2         33.0         AZ           SMBJ12(C)A         12.0         13.30         15.30         1.0         5.0         19.9         30.2         BE           SMBJ13(C)A         13.0         14.40         16.50         1.0         5.0         21.5         27.9         BG           SMBJ14(C)A         14.0         15.60         17.90         1.0         5.0         23.2         25.8         BH	KZ
SMBJ11(C)A     11.0     12.20     14.40     1.0     5.0     18.2     33.0     AZ       SMBJ12(C)A     12.0     13.30     15.30     1.0     5.0     19.9     30.2     BE       SMBJ13(C)A     13.0     14.40     16.50     1.0     5.0     21.5     27.9     BC       SMBJ14(C)A     14.0     15.60     17.90     1.0     5.0     23.2     25.8     BH	
SMBJ12(C)A         12.0         13.30         15.30         1.0         5.0         19.9         30.2         BE           SMBJ13(C)A         13.0         14.40         16.50         1.0         5.0         21.5         27.9         BC           SMBJ14(C)A         14.0         15.60         17.90         1.0         5.0         23.2         25.8         BH	
SMBJ13(C)A         13.0         14.40         16.50         1.0         5.0         21.5         27.9         BC           SMBJ14(C)A         14.0         15.60         17.90         1.0         5.0         23.2         25.8         BH	
SMBJ14(C)A 14.0 15.60 17.90 1.0 5.0 23.2 25.8 BH	LG
	LK
SMBJ15(C)A 15.0 16.70 19.20 1.0 5.0 24.4 24.0 BM	LM
SMBJ16(C)A 16.0 17.80 20.50 1.0 5.0 26.0 23.1 BF	LP
SMBJ17(C)A 17.0 18.90 21.70 1.0 5.0 27.6 21.7 BF	LR
SMBJ18(C)A 18.0 20.00 23.30 1.0 5.0 29.2 20.5 BT	LT
SMBJ20(C)A 20.0 22.20 25.50 1.0 5.0 32.4 18.5 BV	LV
SMBJ22(C)A 22.0 24.40 28.00 1.0 5.0 35.5 16.9 BX	LX
SMBJ24(C)A 24.0 26.70 30.70 1.0 5.0 38.9 15.4 BZ	LZ
SMBJ26(C)A 26.0 28.90 33.20 1.0 5.0 42.1 14.2 CE	ME
SMBJ28(C)A 28.0 31.10 35.80 1.0 5.0 45.4 13.2 CC	MG
SMBJ30(C)A 30.0 33.30 38.30 1.0 5.0 48.4 12.4 CM	MK
SMBJ33(C)A 33.0 36.70 42.20 1.0 5.0 53.3 11.3 CM	MM
SMBJ36(C)A 36.0 40.00 46.00 1.0 5.0 58.1 10.3 CF	MP
SMBJ40(C)A 40.0 44.40 51.10 1.0 5.0 64.5 9.3 CF	MR
SMBJ43(C)A 43.0 47.80 54.90 1.0 5.0 69.4 8.6 CT	MT
SMBJ45(C)A 45.0 50.00 57.50 1.0 5.0 72.7 8.3 CV	MV
SMBJ48(C)A 48.0 53.30 61.30 1.0 5.0 77.4 7.7 C)	MX
SMBJ51(C)A 51.0 56.70 65.20 1.0 5.0 82.4 7.3 C2	MZ
SMBJ54(C)A 54.0 60.00 69.00 1.0 5.0 87.1 6.9 DE	NE
SMBJ58(C)A 58.0 64.40 74.60 1.0 5.0 93.6 6.4 DC	NG
SMBJ60(C)A 60.0 66.70 76.70 1.0 5.0 96.8 6.2 DF	NK
SMBJ64(C)A 64.0 71.10 81.80 1.0 5.0 103.0 5.8 DM	NM
SMBJ70(C)A 70.0 77.80 89.50 1.0 5.0 113.0 5.3 DF	NP
SMBJ75(C)A 75.0 83.30 95.80 1.0 5.0 121.0 4.9 DF	NR
SMBJ78(C)A 78.0 86.70 99.70 1.0 5.0 126.0 4.7 DT	NT
SMBJ85(C)A 85.0 94.40 108.20 1.0 5.0 137.0 4.4 DV	NV
SMBJ90(C)A 90.0 100.0 115.50 1.0 5.0 146.0 4.1 D	NX
SMBJ100(C)A 100.0 111.0 128.00 1.0 5.0 162.0 3.7 DZ	NZ
SMBJ110(C)A 110.0 122.0 140.00 1.0 5.0 177.0 3.4 EE	PE
SMBJ120(C)A 120.0 133.0 153.00 1.0 5.0 193.0 3.1 EC	PG
SMBJ130(C)A 130.0 144.0 165.50 1.0 5.0 209.0 2.9 EM	PK
SMBJ150(C)A 150.0 167.0 192.50 1.0 5.0 243.0 2.5 EN	PM
SMBJ160(C)A 160.0 178.0 205.00 1.0 5.0 259.0 2.3 EF	PP
SMBJ170(C)A 170.0 189.0 217.50 1.0 5.0 275.0 2.2 EF	PR
SMBJ170(C)A 170.0 189.0 217.30 1.0 3.0 273.0 2.2 EF	PT
SMBJ200A 200.0 224.00 1.0 1.0 291.6 2.06 - SMBJ200A 200.0 224.00 1.0 1.0 324.0 1.9 -	PV

Notes:

<sup>8.</sup> Suffix C denotes Bi-directional device. 9.  $V_{BR}$  measured with  $I_T$  current pulse = 10ms to 15ms. 10. For Bi-Directional devices having  $V_{RWM}$  of 10V and under, the  $I_R$  is doubled.







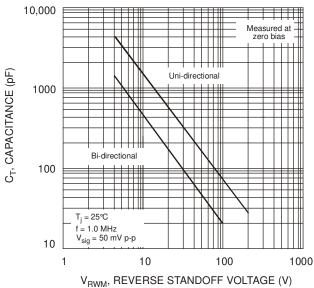
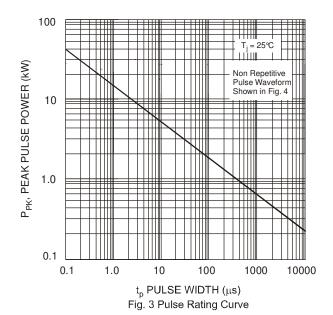
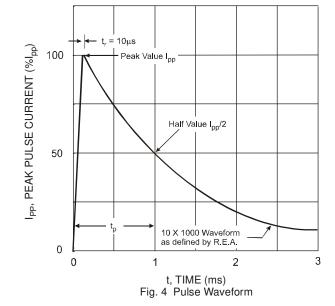


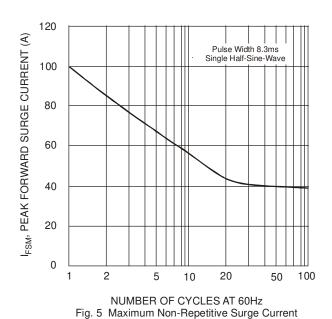
Fig. 2 Typical Total Capacitance

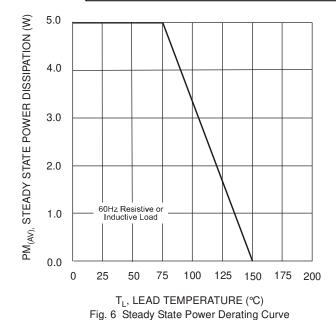






# SMBJ5.0(C)A - SMBJ200A

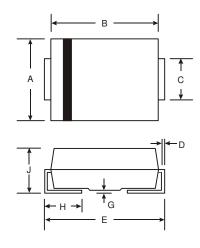




**Package Outline Dimensions** 

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

### SMB



SMB		
Dim	Min	Max
Α	3.30	3.94
В	4.06	4.57
С	1.96	2.21
D	0.15	0.31
Е	5.00	5.59
G	0.05	0.20
Н	0.76	1.52
J	2.00	2.50
All Dimensions in mm		

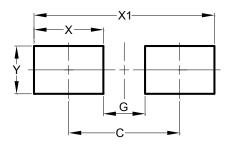
Note: 11. The bar in the upper drawing is polarity indicator for Cathode Band. It is for Uni-directional devices only. Bi-directional devices have no polarity Indicator.



# **Suggested Pad Layout**

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

#### **SMB**



Dimensions	Value (in mm)
С	4.30
G	1.80
Х	2.50
X1	6.80
Υ	2.30

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  - 2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

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