600W SURFACE-MOUNT AUTOMOTIVE TRANSIENT VOLTAGE SUPPRESSOR

Product Summary (@T_A = +25°C)

P_{PK}	I_{FSM}	V_{RWM}	$P_{M(AV)}$
600W	100A	5V to 200V	5W

Features and Benefits

- 600W Peak Pulse Power Dissipation
- 5V to 200V Standoff Voltages
- Uni-directional and Bi-directional Versions Available
- Excellent Clamping Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The SMBJ5.0(C)AQ–SMBJ200(C)AQ are suitable for automotive applications requiring specific change control; these parts are AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

Description and Applications

Suitable to protect sensitive automotive circuits against surges defined in ISO7637-2 and against electrostatic discharges according to ISO10605.

Compliance with the following standards:

- ISO10605, C = 150pF, R = 330Ω:
  - 30kV (Air Discharge)
  - 30kV (Contact Discharge)
- ISO7637-2 (Note 5)
  - Pulse 1: Vs = -150V
  - Pulse 2a: Vs = +112V
  - Pulse 3a: Vs = -220V
  - Pulse 3b: Vs = +150V

Mechanical Data

- Package: SMB
- Package 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 e3
- Weight: 0.1 grams (Approximate)

SMB



Top View



Bottom View

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
SMBJX.X(C)AQ-13-F	SMB	3,000	Tape & Reel
SMBJXX(C)AQ-13-F	SMB	3,000	Tape & Reel
SMBJXXX(C)AQ-13-F	SMB	3,000	Tape & Reel

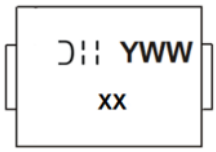
*X = Device Voltage, e.g., SMBJ14AQ-13-F.

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
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/.
5. Not applicable to parts with standoff voltage lower than the average battery voltage (13.5V).

© 2025 Copyright Diodes Incorporated. All Rights Reserved.

Marking Information

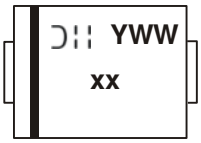
Bi-directional Device





Bi-directional

Cathode Band for Uni-directional Device





Uni-directional

xx = Product Type Marking Code (See Page 3)
= Manufacturer's Marking
YWW = Date Code Marking
Y = Last Digit of Year (ex: 5 for 2025)
WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Peak Pulse Power Dissipation (Non-Repetitive Current Pulse Derated Above T_A = +25°C) (Note 6)	P_{PK}	600	W
Peak Power Derating Above +25°C	P_{DER}	4.8	W/°C
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed on Rated Load (Notes 6, 7, 8)	I_{FSM}	100	A
Steady-State Power Dissipation @ T_L = +75°C	$PM_{(AV)}$	5.0	W
Instantaneous Forward Voltage @ I_{PP} = 35A (Notes 6, 7, 8)	V_F	3.5	V

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Operating Temperature Range	T_J	-55 to +175	°C
Storage Temperature Range	T_{STG}	-55 to +175	°C

Notes: 6. Valid provided that terminals are kept at ambient temperature.
7. Measured with 8.3ms single half sine wave. Duty cycle = 4 pulses per minute maximum.
8. Uni-directional units only.

© 2025 Copyright Diodes Incorporated. All Rights Reserved.

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

Type Number Add C for Bi-directional (Note 9)	Reverse Standoff Voltage	Breakdown Voltage V_{BR} @ I_T (Note 10)		Test Current	Max Reverse Leakage @ V_{RWM} (Note 11)	Max Clamping Voltage @ I_{PP} (Note 12)	Max Peak Pulse Current	Marking Code	
	V_{RWM} (V)	Min (V)	Max (V)	I_T (mA)	I_R (µA)	V_C (V)	I_{PP} (A)	BI-	UNI-
SMBJ5.0(C)AQ	5.0	6.40	7.07	10	800	9.2	65.2	AE	KE
SMBJ6.0(C)AQ	6.0	6.67	7.37	10	800	10.3	58.3	AG	KG
SMBJ6.5(C)AQ	6.5	7.22	7.98	10	500	11.2	53.6	AK	KK
SMBJ7.0(C)AQ	7.0	7.78	8.60	1.0	200	12.0	50.0	AM	KM
SMBJ7.5(C)AQ	7.5	8.33	9.21	1.0	100	12.9	46.5	AP	KP
SMBJ8.0(C)AQ	8.0	8.89	9.83	1.0	50	13.6	44.1	AR	KR
SMBJ10(C)AQ	10.0	11.10	12.30	1.0	0.5	17.0	35.3	AX	KX
SMBJ11(C)AQ	11.0	12.20	13.50	1.0	0.5	18.2	33.0	AZ	KZ
SMBJ12(C)AQ	12.0	13.30	14.70	1.0	0.5	19.9	30.2	BE	LE
SMBJ13(C)AQ	13.0	14.40	15.90	1.0	0.5	21.5	27.9	BG	LG
SMBJ14(C)AQ	14.0	15.60	17.20	1.0	0.5	23.2	25.8	BK	LK
SMBJ15(C)AQ	15.0	16.70	18.50	1.0	0.5	24.4	24.0	BM	LM
SMBJ16(C)AQ	16.0	17.80	19.70	1.0	0.5	26.0	23.1	BP	LP
SMBJ17(C)AQ	17.0	18.90	20.90	1.0	0.5	27.6	21.7	BR	LR
SMBJ18(C)AQ	18.0	20.00	22.10	1.0	0.5	29.2	20.5	BT	LT
SMBJ20(C)AQ	20.0	22.20	24.50	1.0	0.5	32.4	18.5	BV	LV
SMBJ22(C)AQ	22.0	24.40	27.00	1.0	0.5	35.5	16.9	BX	LX
SMBJ24(C)AQ	24.0	26.70	29.50	1.0	0.5	38.9	15.4	BZ	LZ
SMBJ26(C)AQ	26.0	28.90	31.90	1.0	0.5	42.1	14.2	CE	ME
SMBJ28(C)AQ	28.0	31.10	34.40	1.0	0.5	45.4	13.2	CG	MG
SMBJ30(C)AQ	30.0	33.30	36.80	1.0	0.5	48.4	12.4	CK	MK
SMBJ33(C)AQ	33.0	36.70	40.60	1.0	0.5	53.3	11.3	CM	MM
SMBJ36(C)AQ	36.0	40.00	44.20	1.0	0.5	58.1	10.3	CP	MP
SMBJ40(C)AQ	40.0	44.40	49.10	1.0	0.5	64.5	9.3	CR	MR
SMBJ43(C)AQ	43.0	47.80	52.80	1.0	0.5	69.4	8.6	CT	MT
SMBJ45(C)AQ	45.0	50.00	55.30	1.0	0.5	72.7	8.3	CV	MV
SMBJ48(C)AQ	48.0	53.30	58.90	1.0	0.5	77.4	7.7	CX	MX
SMBJ51(C)AQ	51.0	56.70	62.70	1.0	0.5	82.4	7.3	CZ	MZ
SMBJ54(C)AQ	54.0	60.00	66.30	1.0	0.5	87.1	6.9	DE	NE
SMBJ58(C)AQ	58.0	64.40	71.20	1.0	0.5	93.6	6.4	DG	NG
SMBJ60(C)AQ	60.0	66.70	73.70	1.0	0.5	96.8	6.2	DK	NK
SMBJ64(C)AQ	64.0	71.10	78.60	1.0	0.5	103.0	5.8	DM	NM
SMBJ70(C)AQ	70.0	77.80	86.00	1.0	0.5	113.0	5.3	DP	NP
SMBJ75(C)AQ	75.0	83.30	92.10	1.0	0.5	121.0	4.9	DR	NR
SMBJ78(C)AQ	78.0	86.70	95.80	1.0	0.5	126.0	4.7	DT	NT
SMBJ85(C)AQ	85.0	94.40	104.00	1.0	0.5	137.0	4.4	DV	NV
SMBJ100(C)AQ	100.0	111.0	123.00	1.0	0.5	162.0	3.7	DZ	NZ
SMBJ110(C)AQ	110.0	122.0	135.00	1.0	0.5	177.0	3.4	EE	PE
SMBJ130(C)AQ	130.0	144.0	159.00	1.0	0.5	209.0	2.9	EK	PK
SMBJ170(C)AQ	170.0	189.0	209.00	1.0	0.5	275.0	2.2	ER	PR
SMBJ180(C)AQ	180.0	200.00	220.00	1.0	0.5	291.6	2.06	ET	PT
SMBJ200(C)AQ	200.0	224.00	247.00	1.0	0.5	324.0	1.9	EV	PV

Notes: 9. Suffix C denotes bi-directional devices.
10. V_{BR} measured with I_T current pulse = 10ms to 15ms.
11. For bi-directional devices having V_{RWM} of 10V and under, the I_R is doubled.
12. Per 10 × 1000µs waveform. See Figure 4.

© 2025 Copyright Diodes Incorporated. All Rights Reserved.

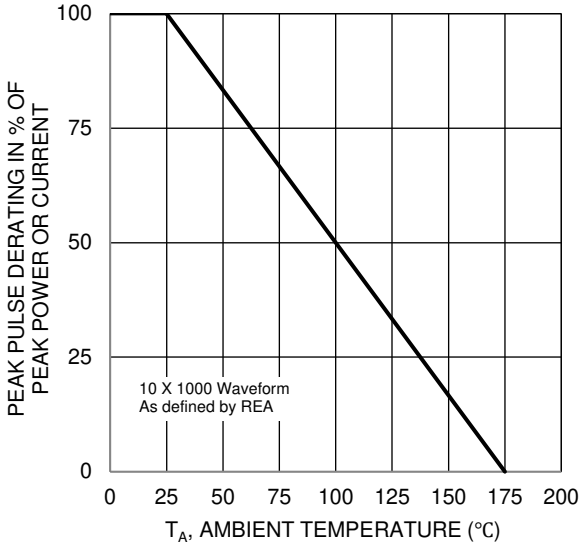


Figure 1. Pulse Derating Curve

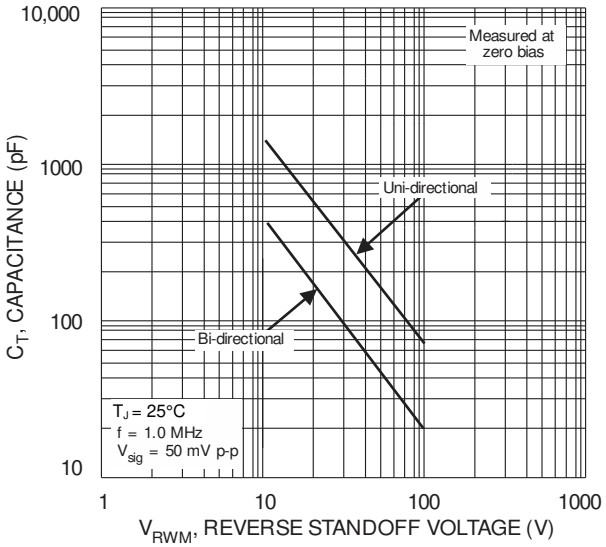


Figure 2. Typical Total Capacitance

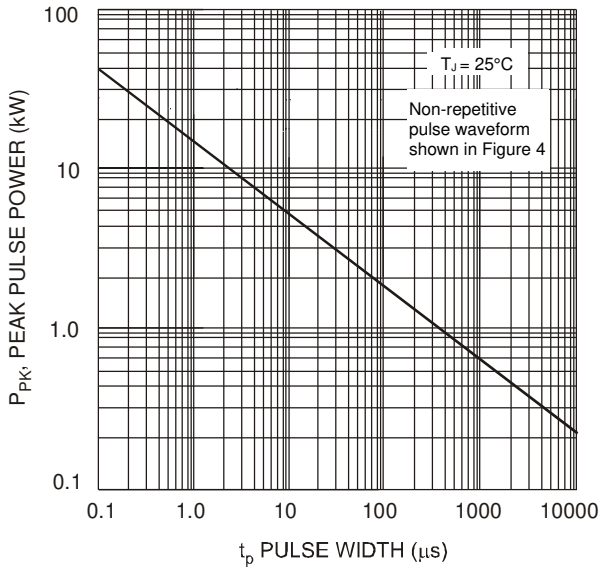


Figure 3. Pulse Rating Curve

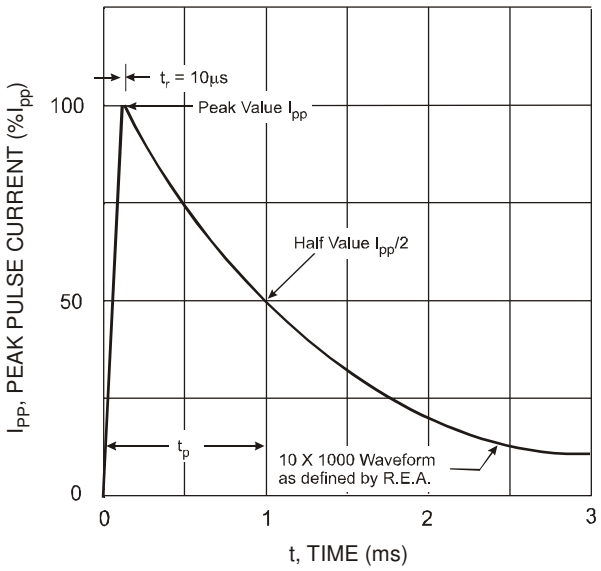


Figure 4. Pulse Waveform

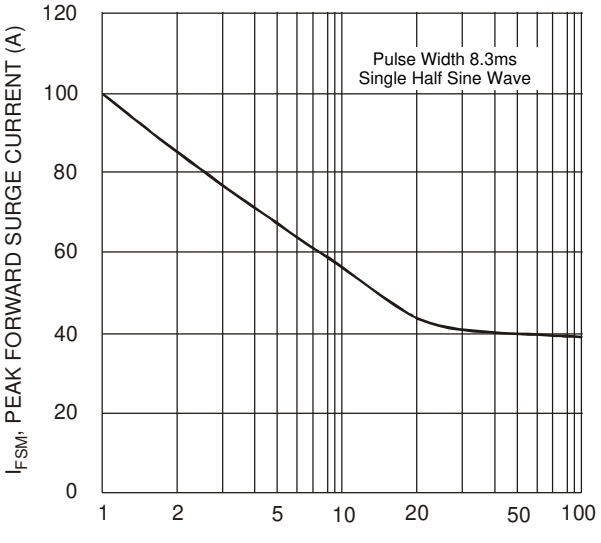


Figure 5. Maximum Non-Repetitive Surge Current

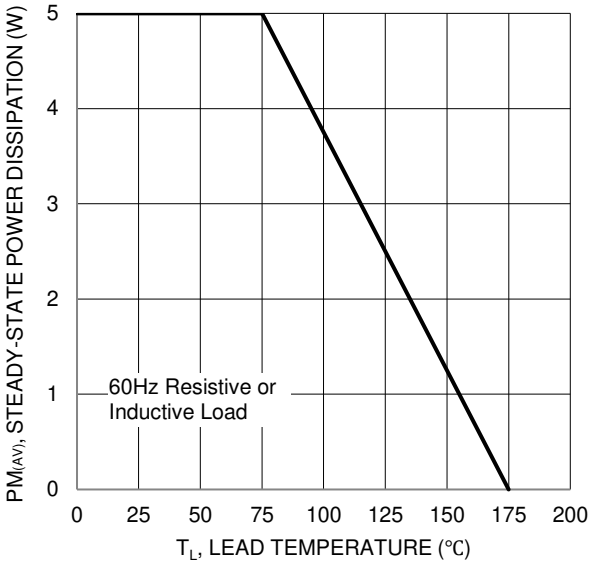


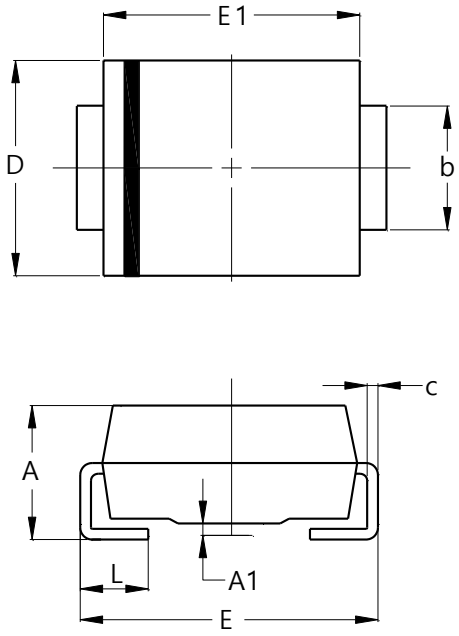
Figure 6. Steady-State Power Derating Curve

© 2025 Copyright Diodes Incorporated. All Rights Reserved.

Package Outline Dimensions (Note 13)

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

SMB



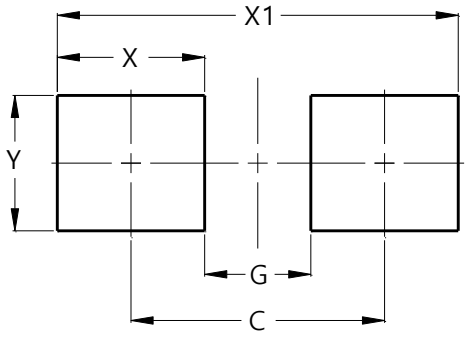
SMB		
Dim	**Min**	**Max**
A	2.00	2.50
A1	0.05	0.20
b	1.96	2.21
c	0.15	0.31
D	3.30	3.94
E	5.00	5.59
E1	4.06	4.57
L	0.76	1.52
All Dimensions in mm		

Note: 13. 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)
C	4.30
G	1.80
X	2.50
X1	6.80
Y	2.30

© 2025 Copyright Diodes Incorporated. All Rights Reserved.

IMPORTANT NOTICE

1. DIODES INCORPORATED (Diodes) AND ITS SUBSIDIARIES MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes' products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes' products. Diodes' products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of Diodes' products for their intended applications, (c) ensuring their applications, which incorporate Diodes' products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.

3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.

4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.

5. Diodes' products are provided subject to Diodes' Standard Terms and Conditions of Sale (https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

6. Diodes' products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes' products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.

7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.

8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.

9. This Notice may be periodically updated with the most recent version available at https://www.diodes.com/about/company/terms-and-conditions/important-notice

The Diodes logo is a registered trademark of Diodes Incorporated in the United States and other countries.
All other trademarks are the property of their respective owners.
© 2025 Diodes Incorporated. All Rights Reserved.

www.diodes.com

© 2025 Copyright Diodes Incorporated. All Rights Reserved.