600W SURFACE-MOUNT AUTOMOTIVE TRANSIENT VOLTAGE SUPPRESSOR

Product Summary (@T_A = +25°C)

P_{PK}	I_{FSM}	V_{RWM}	$PM_{(AV)}$
600W	100A	6.5V to 130V	5W

Features and Benefits

- 600W Peak Pulse Power Dissipation
- 6.5V to 130V Standoff Voltages
- Glass Passivated Die Construction
- Unidirectional and Bidirectional Versions Available
- Excellent Clamping Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The SMBJ6.5(C)AQ – SMBJ130(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.

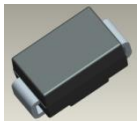
Compliance with the following standards:

- 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

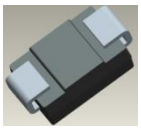
Mechanical Data

- 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)

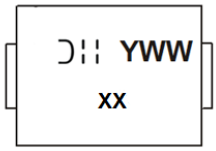
Part Number	Package	Packing	
		Qty.	Carrier
SMBJX.X(C)AQ-13-F	SMB	3000	Tape & Reel
SMBJXX(C)AQ-13-F	SMB	3000	Tape & Reel
SMBJXXX(C)AQ-13-F	SMB	3000	Tape & Reel

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

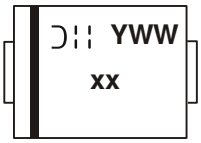
Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. 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).

Marking Information

Bidirectional Device



Cathode Band for Unidirectional Device



xx = Product Type Marking Code (See Page 3)
= Manufacturer's Marking
YWW = Date Code Marking
Y = Last Digit of Year (ex: 3 for 2023)
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 +150	°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. Unidirectional units only.

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

Part Number Add C for Bidirectional (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-
SMBJ6.5(C)AQ	6.5	7.22	8.30	10	500	11.2	53.6	AK	KK
SMBJ7.0(C)AQ	7.0	7.78	8.95	10	200	12.0	50.0	AM	KM
SMBJ12(C)AQ	12.0	13.30	15.30	1.0	5.0	19.9	30.2	BE	LE
SMBJ14(C)AQ	14.0	15.60	17.90	1.0	5.0	23.2	25.8	BK	LK
SMBJ15(C)AQ	15.0	16.70	19.20	1.0	5.0	24.4	24.0	BM	LM
SMBJ16(C)AQ	16.0	17.80	20.50	1.0	5.0	26.0	23.1	BP	LP
SMBJ17(C)AQ	17.0	18.90	21.70	1.0	5.0	27.6	21.7	BR	LR
SMBJ18(C)AQ	18.0	20.00	23.30	1.0	5.0	29.2	20.5	BT	LT
SMBJ20(C)AQ	20.0	22.20	25.50	1.0	5.0	32.4	18.5	BV	LV
SMBJ22(C)AQ	22.0	24.40	28.00	1.0	5.0	35.5	16.9	BX	LX
SMBJ24(C)AQ	24.0	26.70	30.70	1.0	5.0	38.9	15.4	BZ	LZ
SMBJ26(C)AQ	26.0	28.90	33.20	1.0	5.0	42.1	14.2	CE	ME
SMBJ28(C)AQ	28.0	31.10	35.80	1.0	5.0	45.4	13.2	CG	MG
SMBJ30(C)AQ	30.0	33.30	38.30	1.0	5.0	48.4	12.4	CK	MK
SMBJ33(C)AQ	33.0	36.70	42.20	1.0	5.0	53.3	11.3	CM	MM
SMBJ36(C)AQ	36.0	40.00	46.00	1.0	5.0	58.1	10.3	CP	MP
SMBJ40(C)AQ	40.0	44.40	51.10	1.0	5.0	64.5	9.3	CR	MR
SMBJ45(C)AQ	45.0	50.00	57.50	1.0	5.0	72.7	8.3	CV	MV
SMBJ51(C)AQ	51.0	56.70	65.20	1.0	5.0	82.4	7.3	CZ	MZ
SMBJ58(C)AQ	58.0	64.40	74.60	1.0	5.0	93.6	6.4	DG	NG
SMBJ60(C)AQ	60.0	66.70	76.70	1.0	5.0	96.8	6.2	DK	NK
SMBJ64(C)AQ	64.0	71.10	81.80	1.0	5.0	103.0	5.8	DM	NM
SMBJ70(C)AQ	70.0	77.80	89.50	1.0	5.0	113.0	5.3	DP	NP
SMBJ75(C)AQ	75.0	83.30	95.80	1.0	5.0	121.0	4.9	DR	NR
SMBJ85(C)AQ	85.0	94.40	108.20	1.0	5.0	137.0	4.4	DV	NV
SMBJ100(C)AQ	100.0	111.0	128.00	1.0	5.0	162.0	3.7	DZ	NZ
SMBJ110(C)AQ	110.0	122.0	140.00	1.0	5.0	177.0	3.4	EE	PE
SMBJ130(C)AQ	130.0	144.0	165.50	1.0	5.0	209.0	2.9	EK	PK

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

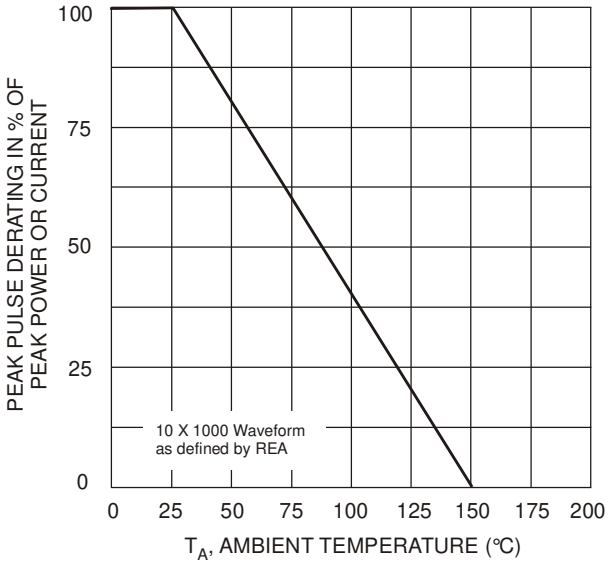


Figure 1. Pulse Derating Curve

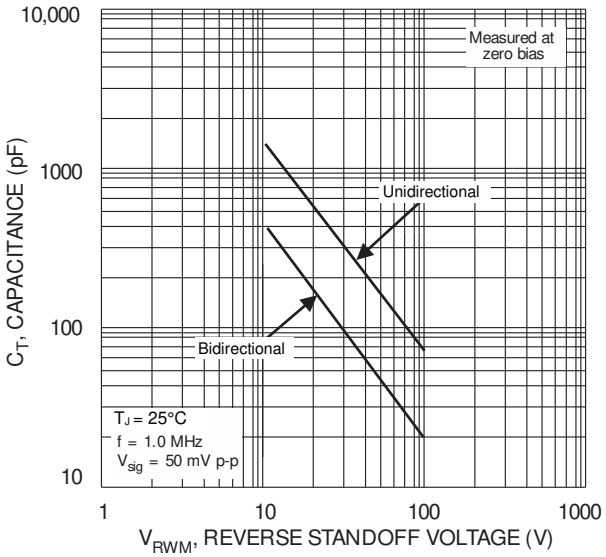


Figure 2. Typical Total Capacitance

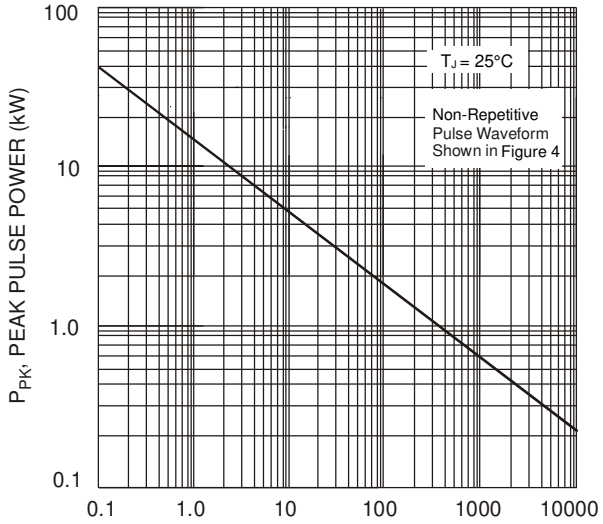


Figure 3. Pulse Rating Curve

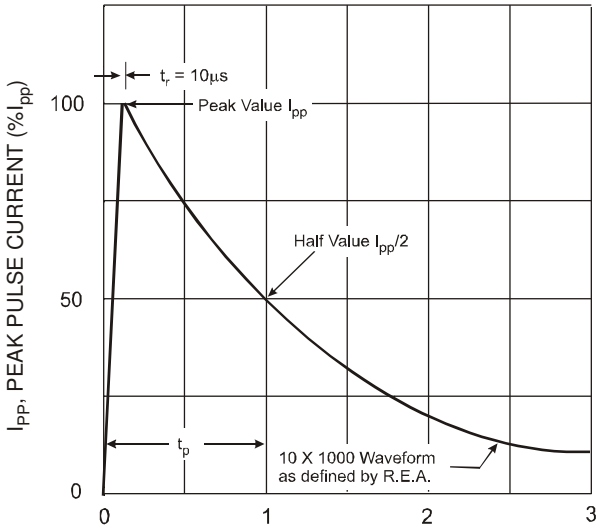


Figure 4. Pulse Waveform

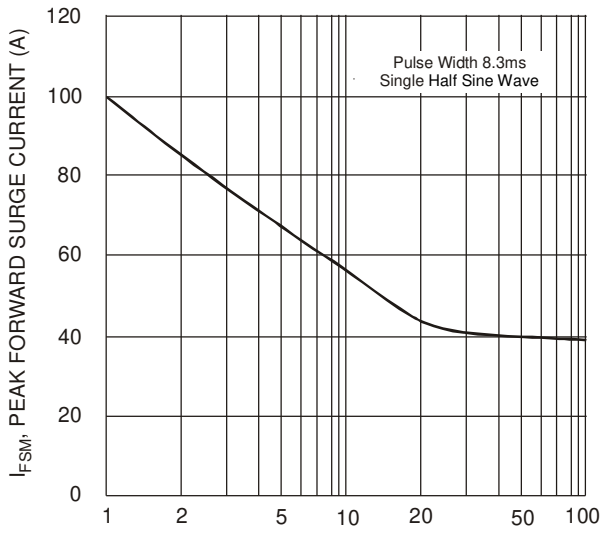


Figure 5. Maximum Non-Repetitive Surge Current

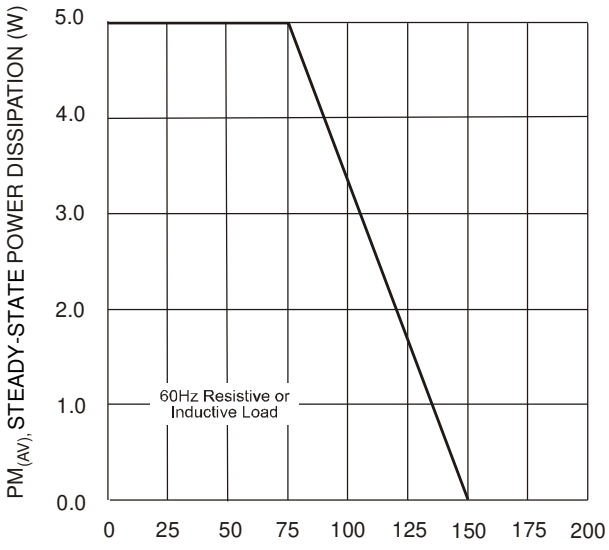


Figure 6. Steady-State Power Derating Curve

Package Outline Dimensions (Note 13)

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

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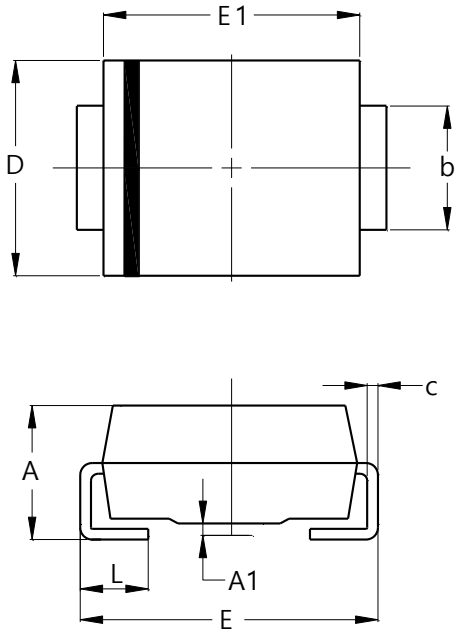

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Dim	**Min**	**Max**
A	2.00	2.50
A1	0.05	0.20
b	1.96	2.21
c	0.15	0.31
D	3.30	3.94
E	5.00	5.59
E1	4.06	4.57
L	0.76	1.52
All Dimensions in mm		

Note: 13. The bar in the upper drawing is polarity indicator for Cathode Band. It is for unidirectional devices only. Bidirectional devices have no polarity Indicator.

Suggested Pad Layout

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

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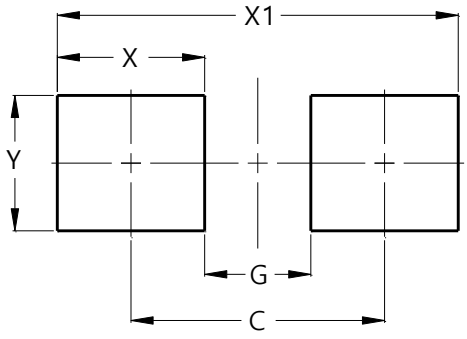

Dimensions	Value (in mm)
C	4.30
G	1.80
X	2.50
X1	6.80
Y	2.30

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