

Product Summary (@ T_A = +25°C)

PPK	IFSM	VRWM	PM(AV)
600W	100A	6.5V to 100V	5W

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: V_S = -150V
 - Pulse 2a: V_S = +112V
 - Pulse 3a: V_S = -220V
 - Pulse 3b: V_S = +150V

Features and Benefits

- 600W Peak Pulse Power Dissipation
- 6.5V to 100V 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 - SMBJ100(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/>

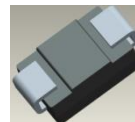
Mechanical Data

- 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 (63)
- Weight: 0.1 grams (Approximate)

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Top View



Bottom View

Ordering Information (Note 4)

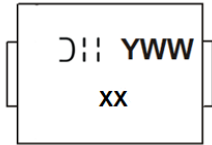
Part Number	Qualification	Package	Packing	
			Qty.	Carrier
SMBJX.X(C)AQ-13-F	Automotive	SMB	3000	Tape & Reel
SMBJXX(C)AQ-13-F	Automotive	SMB	3000	Tape & Reel
SMBJXXX(C)AQ-13-F	Automotive	SMB	3000	Tape & Reel

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

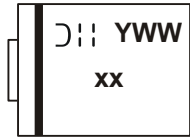
- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 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 stand-off 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: 1 for 2021)
 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 Bi- Directional (Note 9)	Reverse Standoff Voltage V _{RWM} (V)	Breakdown Voltage V _{BR} @ I _T (Note 10)		Test Current I _T (mA)	Max. Reverse Leakage @ V _{RWM} (Note 12) I _R (µA)	Max. Clamping Voltage @ I _{PP} (Note 11) V _C (V)	Max. Peak Pulse Current I _{PP} (A)	Marking Code	
		Min (V)	Max (V)					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
SMBJ70(C)AQ	70.0	77.80	89.50	1.0	5.0	113.0	5.3	DP	NP
SMBJ100(C)AQ	100.0	111.0	128.00	1.0	5.0	162.0	3.7	DZ	NZ

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

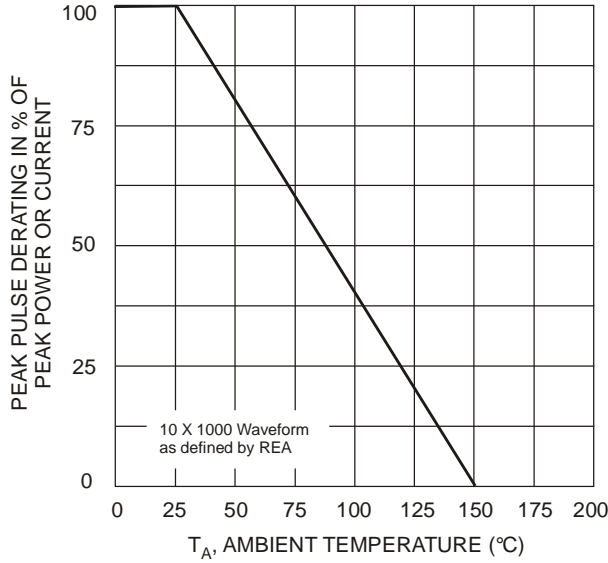


Fig. 1 Pulse Derating Curve

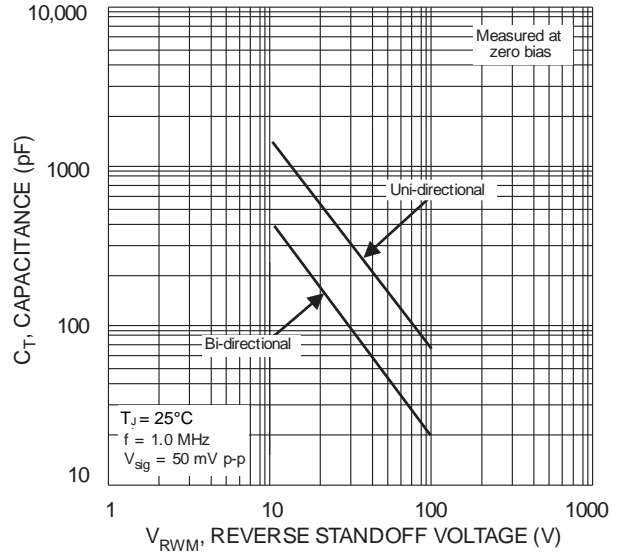


Fig. 2 Typical Total Capacitance

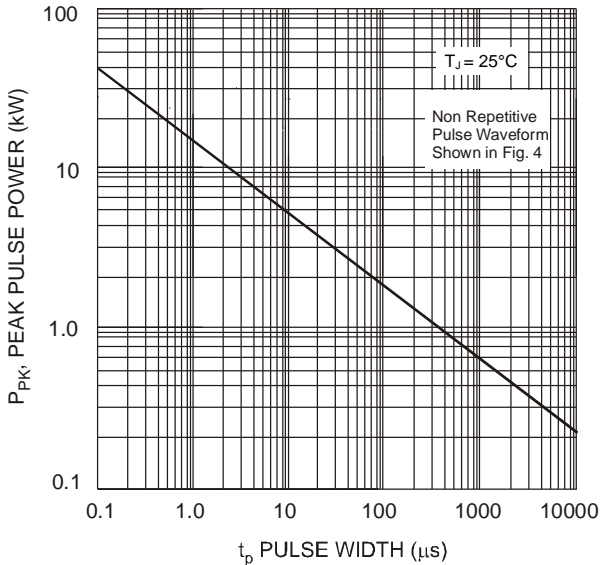


Fig. 3 Pulse Rating Curve

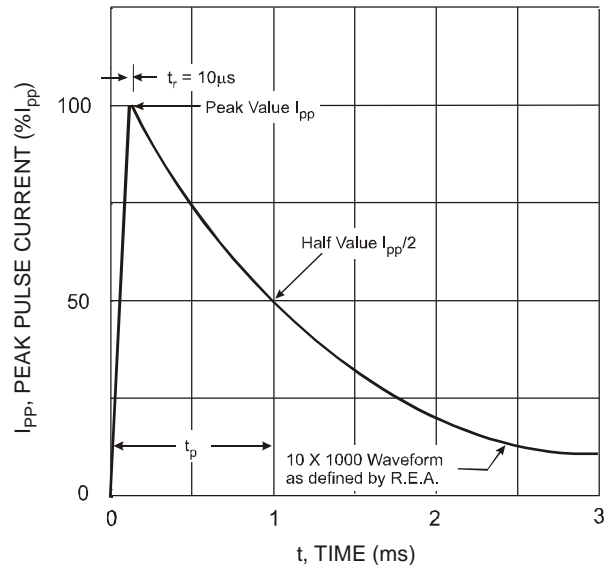


Fig. 4 Pulse Waveform

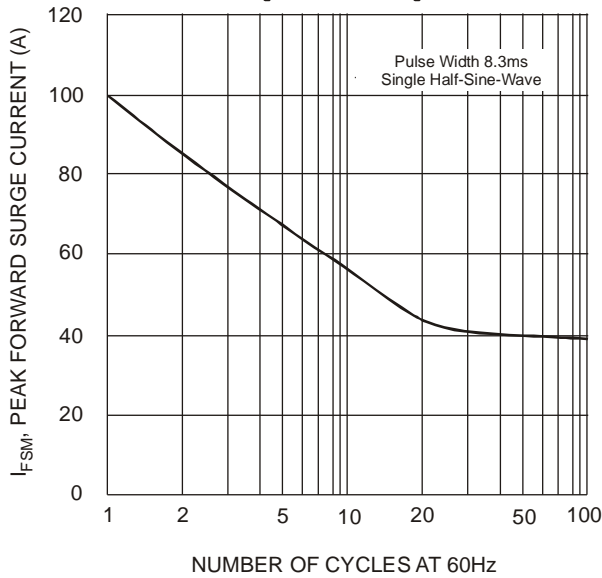


Fig. 5 Maximum Non-Repetitive Surge Current

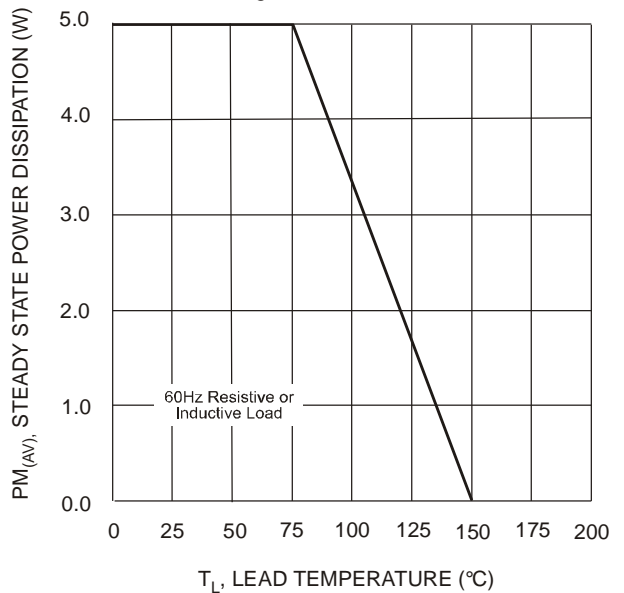
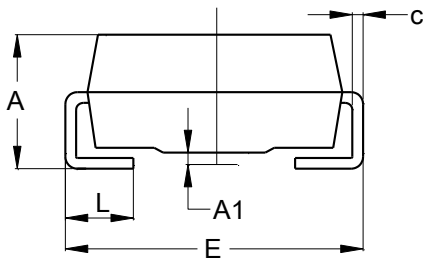
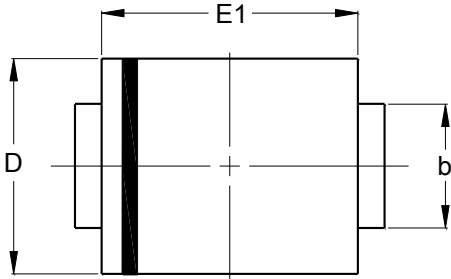


Fig. 6 Steady State Power Derating Curve

Package Outline Dimensions (Note 13)

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

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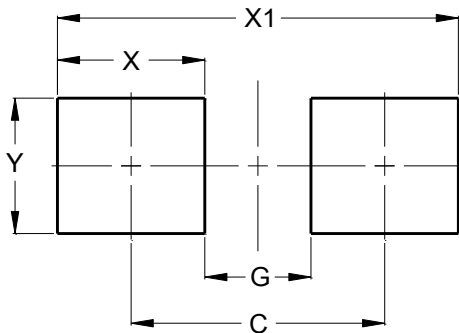
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Dim	Min	Max
A	2.00	2.50
A1	0.05	0.20
b	1.96	2.21
c	0.15	0.31
D	3.30	3.94
E	5.00	5.59
E1	4.06	4.57
L	0.76	1.52
All Dimensions in mm		

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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