

## Product Summary

P <sub>PK</sub>	I <sub>FSM</sub> (A)	V <sub>RWM</sub> (V)	PM <sub>(AV)</sub>
5000W	300	10 to 18	2.0W

## Description and Applications

This device is 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:  
Pulse 1: V<sub>S</sub> = -150V  
Pulse 2a: V<sub>S</sub> = +112V  
Pulse 3a: V<sub>S</sub> = -220V  
Pulse 3b: V<sub>S</sub> = +150V

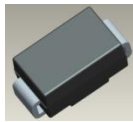
## Features

- 5000W Peak Pulse Power Dissipation
- 10V to 18V Standoff Voltages
- ONO Passivated Die Construction
- Excellent Clamping Capability
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Notes 3)
- The 5.0SMCJ10(C)AQ–5.0SMCJ18(C)AQ are suitable for automotive applications requiring specific change control; these parts are AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.

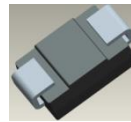
<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Package: SMC
- Package Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208  
Lead-Free Plating (Matte Tin Finish) Ⓔ3
- Weight: 0.21 grams (Approximate)



Top View



Bottom View

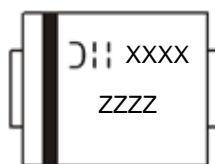
## Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
5.0SMCJXX(C)AQ-13-F	SMC	3,000	Tape & Reel

XX = Device Voltage, e.g., 5.0SMCJ10AQ-13-F

- Notes:
- EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  - 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.
  - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



Cathode Anode  
Uni-directional



Bi-directional

XXXX = Assembly Tracing Code  
ZZZZ = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Power Dissipation (Note 5)	P <sub>PP</sub>	5000	W	T <sub>J</sub> = +25°C, t <sub>p</sub> = 1ms (See Figure 3)
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed on Rated Load (Notes 6 & 7)	I <sub>FSM</sub>	300	A	8.3ms single half sine wave @T <sub>J</sub> = +25°C (Note 5)
Steady-State Power Dissipation with PCB	PM <sub>(AV)</sub>	2.0	W	See Figure 4
ESD Protection – Contact Discharge	V <sub>ESD_CONTACT</sub>	±30	kV	Standard IEC 61000-4-2
ESD Protection – Air Discharge	V <sub>ESD_AIR</sub>	±30	kV	Standard IEC 61000-4-2

Notes: 5. Non-repetitive current pulse per Figure 2 and derated above T<sub>A</sub> = +25°C per Figure 1.  
6. Mounted on 8.00mm<sup>2</sup> (0.013mm thick) land areas.  
7. Measured with 8.3ms single half sine wave. Duty cycle = 4 pulses per minute maximum. For uni-directional devices only.

## Thermal Characteristics

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

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

Type Number Add C for Bi-directional (Note 8)	Reverse Standoff Voltage	Breakdown Voltage V <sub>BR</sub> @ I <sub>T</sub> (Note 9)		Test Current	Max Reverse Leakage @ V <sub>RWM</sub> (Note 10)	Max Clamping Voltage @ I <sub>PP</sub> (Note 11)	Max Peak Pulse Current	Marking Code	
	V <sub>RWM</sub> (V)	Min (V)	Max (V)	I <sub>T</sub> (mA)	I <sub>R</sub> (μA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	BI-	UNI-
5.0SMCJ10(C)AQ	10	11.1	12.3	1	20	17.0	294.0	ABDA	AUDA
5.0SMCJ12(C)AQ	12	13.3	14.7	1	10	19.9	251.3	ABDC	AUDC
5.0SMCJ18(C)AQ	18	20.0	22.1	1	2	29.2	171.2	ABDI	AUDI

Notes: 8. Suffix C denotes bi-directional devices.  
9. V<sub>BR</sub> measured with I<sub>T</sub> current pulse = 10ms to 15ms.  
10. For bi-directional devices having V<sub>RWM</sub> of 10V and under, the I<sub>R</sub> is doubled.  
11. Per 10 × 1000μs waveform. See Figure 2.

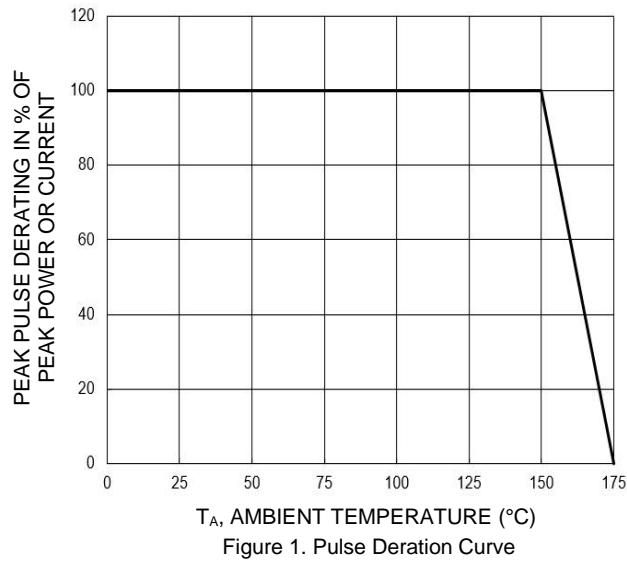


Figure 1. Pulse Deration Curve

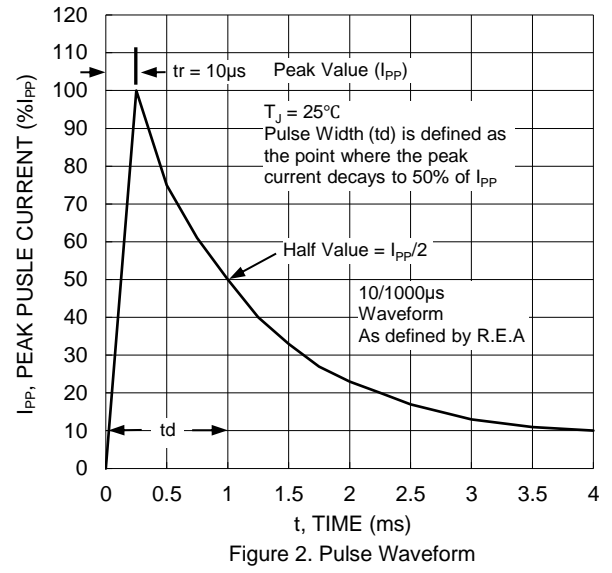


Figure 2. Pulse Waveform

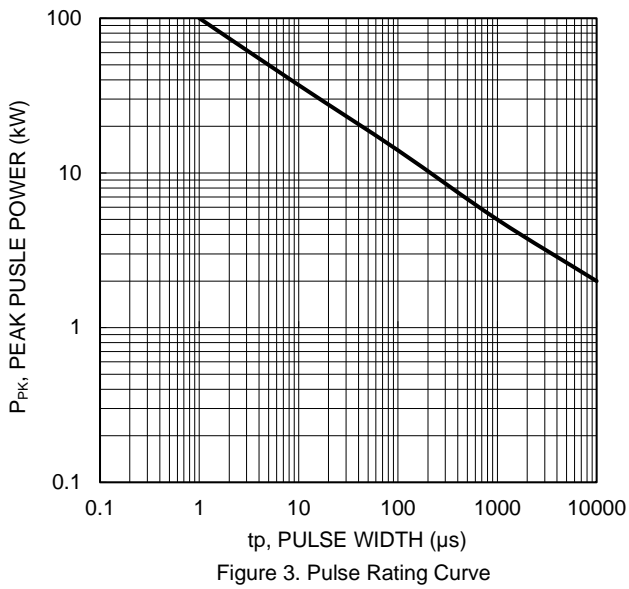


Figure 3. Pulse Rating Curve

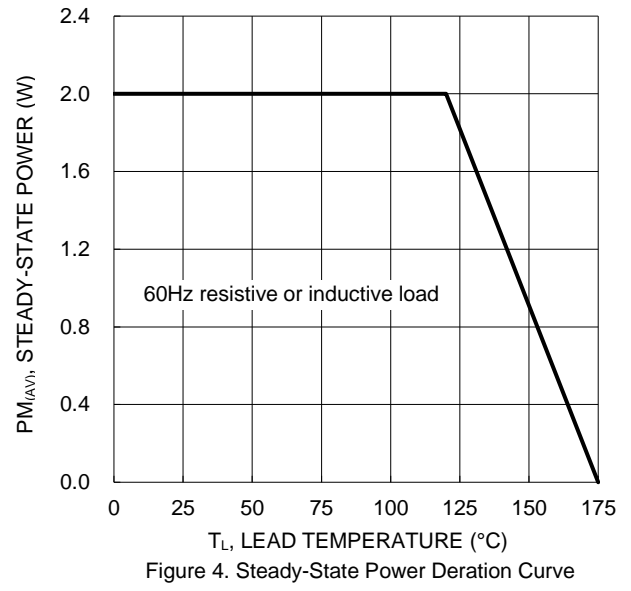
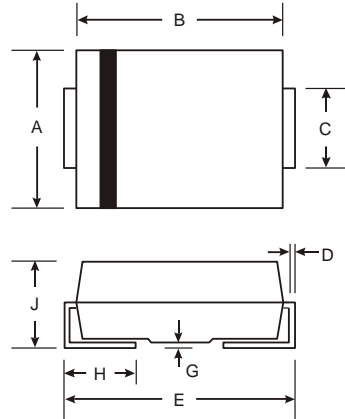


Figure 4. Steady-State Power Deration Curve

## Package Outline Dimensions

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

### SMC

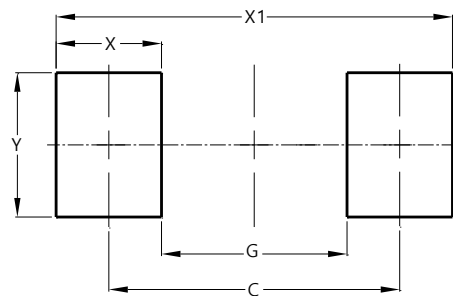


SMC		
Dim	Min	Max
A	5.59	6.22
B	6.60	7.11
C	2.75	3.18
D	0.15	0.31
E	7.75	8.13
G	0.10	0.20
H	0.76	1.52
J	2.00	2.50
All Dimensions in mm		

## Suggested Pad Layout

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

### SMC



Dimensions	Value (in mm)
C	6.90
G	4.40
X	2.50
X1	9.40
Y	3.30

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