600W SURFACE-MOUNT AUTOMOTIVE TRANSIENT VOLTAGE SUPPRESSOR

Product Summary (@T_A = +25°C)

P_{PK}	V_{RWM}
600W	5V to 170V

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 4)
  - Pulse 1: V_S = -150V
  - Pulse 2a: V_S = +112V
  - Pulse 3a: V_S = -220V
  - Pulse 3b: V_S = +150V

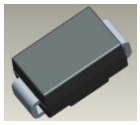
Features and Benefits

- 600W Peak Pulse Power Dissipation
- 5V to 170V Standoff Voltages
- Glass Passivated Die Construction
- Bidirectional Versions Available
- Excellent Clamping Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The SMA6J5.0(C)AQ – SMA6J170(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/

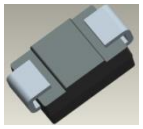
Mechanical Data

- Package: SMA
- 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: 0.062 grams (Approximate)

SMA



Top View



Bottom View

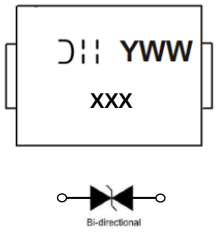
Ordering Information (Note 5)

Part Number	Package	Packing	
		Qty.	Carrier
SMA6JX.X(C)AQ-13	SMA	5000	Tape & Reel
SMA6JXX(C)AQ-13	SMA	5000	Tape & Reel
SMA6JXXX(C)AQ-13	SMA	5000	Tape & Reel

*X = Device Voltage, e.g., SMA6J15CAQ-13.

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. Not applicable to parts with standoff voltage lower than the average battery voltage (13.5V).
5. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



xxx = Product Type Marking Code (See Page 3)
= Manufacturers' 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

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Operating Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +175	°C

Note: 6. Valid provided that terminals are kept at ambient temperature.

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

Part Number (Note 7)	Reverse Standoff Voltage	Breakdown Voltage V_{BR} @ I_T (Note 8)		Test Current	Max Reverse Leakage @ V_{RWM} (Note 10)	Max Clamping Voltage @ I_{PP} (Note 9)	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-
SMA6J5.0(C)AQ	5.0	6.40	7.07	10	1600	9.2	65.2	AET	KET
SMA6J6.0(C)AQ	6.0	6.67	7.37	10	800	10.3	58.3	AGT	KGT
SMA6J6.5(C)AQ	6.5	7.22	7.98	10	500	11.2	53.6	ATT	KTT
SMA6J7.0(C)AQ	7.0	7.78	8.6	10	200	12.0	50.0	AMT	KMT
SMA6J7.5(C)AQ	7.5	8.33	9.21	1.0	100	12.9	46.5	APT	KPT
SMA6J8.0(C)AQ	8.0	8.89	9.83	1.0	50	13.6	44.1	ART	KRT
SMA6J8.5(C)AQ	8.5	9.44	10.4	1.0	20	14.4	41.7	AIT	KIT
SMA6J10(C)AQ	10.0	11.10	12.3	1.0	10	17.0	35.3	AXT	KXT
SMA6J13(C)AQ	13.0	14.40	15.9	1.0	5.0	21.5	27.9	BGT	LGT
SMA6J15(C)AQ	15.0	16.70	18.5	1.0	5.0	24.4	24.0	BMT	LMT
SMA6J18(C)AQ	18.0	20.00	22.1	1.0	5.0	29.2	20.5	BTT	LTT
SMA6J20(C)AQ	20.0	22.20	24.5	1.0	5.0	32.4	18.5	BVT	LVT
SMA6J22(C)AQ	22.0	24.40	27.0	1.0	5.0	35.5	16.9	BXT	LXT
SMA6J24(C)AQ	24.0	26.70	29.5	1.0	5.0	38.9	15.4	BZT	LZT
SMA6J26(C)AQ	26.0	28.90	31.9	1.0	5.0	42.1	14.2	CET	MET
SMA6J28(C)AQ	28.0	31.10	34.4	1.0	5.0	45.4	13.2	CGT	MGT
SMA6J30(C)AQ	30.0	33.30	36.8	1.0	5.0	48.4	12.4	CKT	MKT
SMA6J33(C)AQ	33.0	36.70	40.6	1.0	5.0	53.3	11.3	CMT	MMT
SMA6J36(C)AQ	36.0	40.00	44.2	1.0	5.0	58.1	10.3	CPT	MPT
SMA6J40(C)AQ	40.0	44.40	49.1	1.0	5.0	64.5	9.3	CRT	MRT
SMA6J43(C)AQ	43.0	47.80	52.8	1.0	5.0	69.4	8.6	CTT	MTT
SMA6J45(C)AQ	45.0	50.00	55.3	1.0	5.0	72.7	8.3	CVT	MVT
SMA6J48(C)AQ	48.0	53.30	58.9	1.0	5.0	77.4	7.7	CXT	MXT
SMA6J51(C)AQ	51.0	56.70	62.7	1.0	5.0	82.4	7.3	CZT	MZT
SMA6J54(C)AQ	54.0	60.00	66.3	1.0	5.0	87.1	6.9	DET	NET
SMA6J58(C)AQ	58.0	64.40	71.2	1.0	5.0	93.6	6.4	DGT	NGT
SMA6J60(C)AQ	60.0	66.70	73.7	1.0	5.0	96.8	6.2	DKT	NKT
SMA6J64(C)AQ	64.0	71.10	78.6	1.0	5.0	103.0	5.8	DNT	NNT
SMA6J70(C)AQ	70.0	77.80	86.0	1.0	5.0	113.0	5.3	DPT	NPT
SMA6J75(C)AQ	75.0	83.30	92.1	1.0	5.0	121.0	4.9	DRT	NRT
SMA6J78(C)AQ	78.0	86.70	95.8	1.0	5.0	126.0	4.7	DTT	NTT
SMA6J85(C)AQ	85.0	94.40	104	1.0	5.0	137.0	4.4	DVT	NVT
SMA6J90(C)AQ	90.0	100.0	111	1.0	5.0	146.0	4.1	DXT	NXT
SMA6J100(C)AQ	100.0	111.0	123	1.0	5.0	162.0	3.7	DZT	NZT
SMA6J110(C)AQ	110.0	122.0	135	1.0	5.0	177.0	3.4	EET	PET
SMA6J120(C)AQ	120.0	133.0	147	1.0	5.0	193.0	3.1	EGT	PGT
SMA6J130(C)AQ	130.0	144.0	159	1.0	5.0	209.0	2.9	EKT	PKT
SMA6J150(C)AQ	150.0	167.0	185	1.0	5.0	243.0	2.5	EPT	PPT
SMA6J160(C)AQ	160.0	178.0	197	1.0	5.0	259.0	2.3	ERT	PRT
SMA6J170(C)AQ	170.0	189.0	209	1.0	5.0	275.0	2.2	ETT	PTT

Notes:
7. Suffix C denotes bidirectional device.
8. V_{BR} measured with I_T current pulse = 10ms to 15ms.
9. Per 10 × 1000µs waveform. See Figure 4.
10. The I_R limit is double for bidirectional devices.

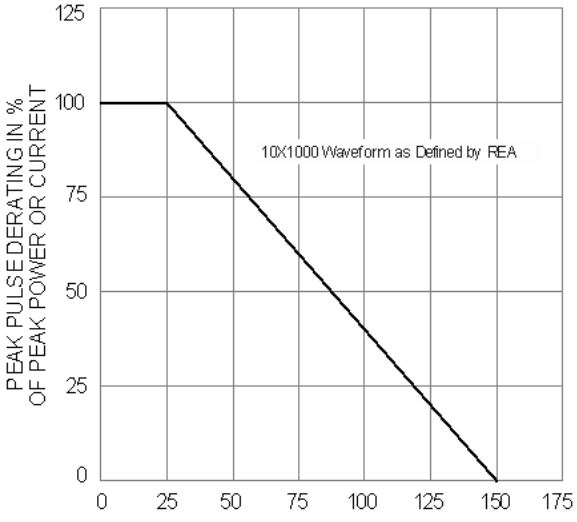


Figure 1. Pulse Derating Curve

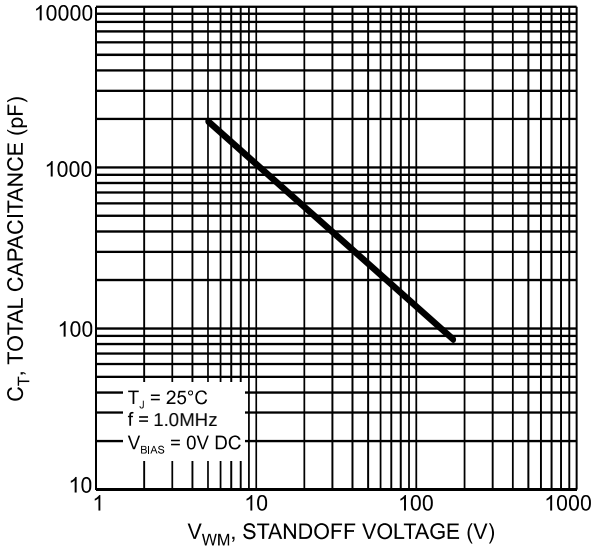


Figure 2. Typical Total Capacitance

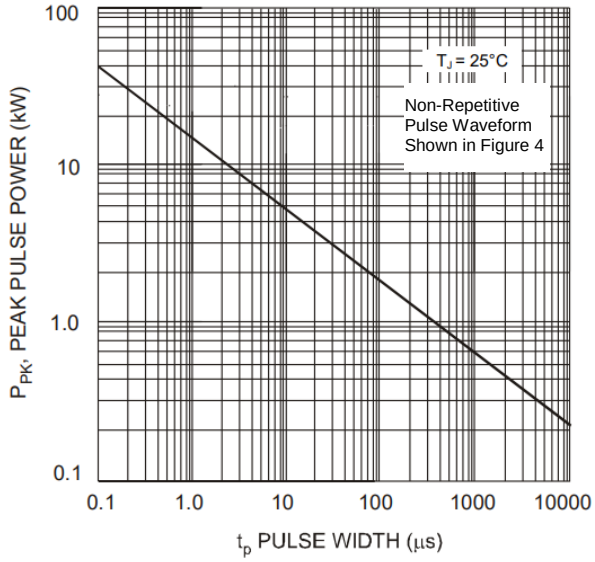


Figure 3. Pulse Rating Curve

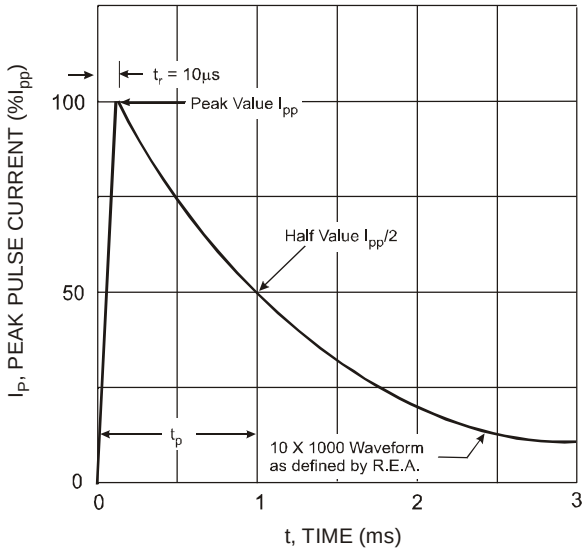
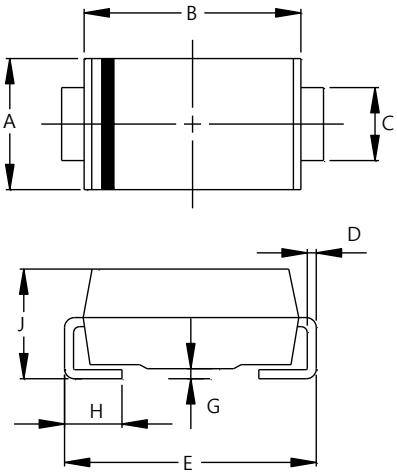


Figure 4. Pulse Waveform

Package Outline Dimensions

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

SMA

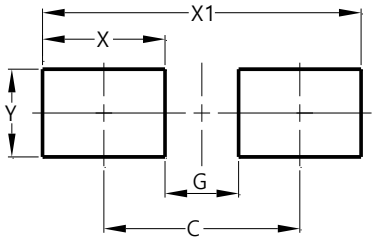


SMA		
Dim	**Min**	**Max**
A	2.29	2.92
B	4.00	4.60
C	1.27	1.63
D	0.15	0.31
E	4.80	5.59
G	0.05	0.20
H	0.76	1.52
J	1.96	2.40
All Dimensions in mm		

Suggested Pad Layout

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

SMA



Dimensions	Value (in mm)
C	4.00
G	1.50
X	2.50
X1	6.50
Y	1.70

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