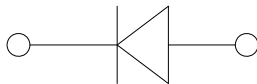
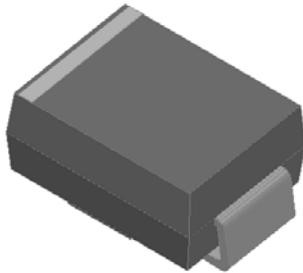


Surface Mount Transient Voltage Suppressors

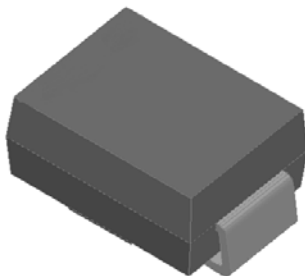
Uni-directional



Features

- Low profile package
- Ideal for automated placement
- Available in Uni-directional and Bi-directional
- 400 W peak pulse power capability with a 10/1000 μ s waveform
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- ISO7637-2 standard:
 - Pulse 1、2a、2b、3a、3b、5b
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- ESD protection of data lines in accordance with IEC 61000-4-2, 30kV(Air),30kV (Contact)
- Part no. with suffix "Q" means AEC-Q101 qualified

Bi-directional



Typical Applications

For use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, automotive, and telecommunication.

Mechanical Data

- **Package:** DO-214AC (SMA)
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Polarity:** For uni-directional types the band denotes cathode end, no marking on bi-directional types

■Maximum Ratings ($T_a=25^\circ\text{C}$ Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Max
Peak power dissipation, with a 10/1000us waveform ^{(1) (2)} (Fig.1)	P_{PPM}	W	400
Peak pulse current, with a 10/1000us waveform ⁽¹⁾	I_{PPM}	A	See Next Table
Power dissipation, $T_a=25^\circ\text{C}$	P_D	W	1.25
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only ⁽²⁾	I_{FSM}	A	40
Operating junction	T_J	$^\circ\text{C}$	-55 to +175
Storage temperature range	T_{STG}	$^\circ\text{C}$	-55 to +175

■Electrical Characteristics ($T_a=25^\circ\text{C}$ Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Maximum instantaneous forward voltage @ 1A for unidirectional only	V_F	V	1.5



SMAJ5.0AQ THRU SMAJ190CAQ

■Electrical Characteristics (T_a=25°C Unless otherwise specified)

Part Number(Uni)	Part Number(Bi)	Breakdown Voltage V _{BR} @I _T			Maximum Reverse Leakage I _R @ V _{RWM} (μA)	Working Peak Reverse Voltage V _{RWM} (V)	Maximum Reverse Surge Current I _{PP} ⁽⁴⁾ (A)	Maximum Clamping Voltage V _c @ I _{PP} (V)
		Min(V)	Max (V)	I _T ⁽³⁾ (mA)				
SMAJ5.0AQ	SMAJ5.0CAQ	6.40	7.07	10	800	5.0	43.4	9.2
SMAJ6.0AQ	SMAJ6.0CAQ	6.67	7.37	10	800	6.0	38.8	10.3
SMAJ6.5AQ	SMAJ6.5CAQ	7.22	7.98	10	500	6.5	35.7	11.2
SMAJ7.0AQ	SMAJ7.0CAQ	7.78	8.60	10	200	7.0	33.3	12.0
SMAJ7.5AQ	SMAJ7.5CAQ	8.33	9.21	1	100	7.5	31.0	12.9
SMAJ8.0AQ	SMAJ8.0CAQ	8.89	9.83	1	50	8.0	29.4	13.6
SMAJ8.5AQ	SMAJ8.5CAQ	9.44	10.40	1	10	8.5	27.8	14.4
SMAJ9.0AQ	SMAJ9.0CAQ	10.00	11.10	1	5	9.0	26.0	15.4
SMAJ10AQ	SMAJ10CAQ	11.10	12.30	1	5	10.0	23.5	17.0
SMAJ11AQ	SMAJ11CAQ	12.20	13.50	1	1	11.0	22.0	18.2
SMAJ12AQ	SMAJ12CAQ	13.30	14.70	1	1	12.0	20.1	19.9
SMAJ13AQ	SMAJ13CAQ	14.40	15.90	1	1	13.0	18.6	21.5
SMAJ14AQ	SMAJ14CAQ	15.60	17.20	1	1	14.0	17.2	23.2
SMAJ15AQ	SMAJ15CAQ	16.70	18.50	1	1	15.0	16.4	24.4
SMAJ16AQ	SMAJ16CAQ	17.80	19.70	1	1	16.0	15.4	26.0
SMAJ17AQ	SMAJ17CAQ	18.90	20.90	1	1	17.0	14.5	27.6
SMAJ18AQ	SMAJ18CAQ	20.00	22.10	1	1	18.0	13.7	29.2
SMAJ19AQ	SMAJ19CAQ	21.10	23.30	1	1	19.0	13.0	30.8
SMAJ20AQ	SMAJ20CAQ	22.20	24.50	1	1	20.0	12.4	32.4
SMAJ22AQ	SMAJ22CAQ	24.40	26.90	1	1	22.0	11.3	35.5
SMAJ24AQ	SMAJ24CAQ	26.70	29.50	1	1	24.0	10.3	38.9
SMAJ26AQ	SMAJ26CAQ	28.90	31.90	1	1	26.0	9.5	42.1
SMAJ28AQ	SMAJ28CAQ	31.10	34.40	1	1	28.0	8.8	45.4
SMAJ30AQ	SMAJ30CAQ	33.30	36.80	1	1	30.0	8.3	48.4
SMAJ33AQ	SMAJ33CAQ	36.70	40.60	1	1	33.0	7.5	53.3
SMAJ36AQ	SMAJ36CAQ	40.00	44.20	1	1	36.0	6.9	58.1
SMAJ40AQ	SMAJ40CAQ	44.40	49.10	1	1	40.0	6.2	64.5
SMAJ43AQ	SMAJ43CAQ	47.80	52.80	1	1	43.0	5.8	69.4
SMAJ45AQ	SMAJ45CAQ	50.00	55.30	1	1	45.0	5.5	72.7
SMAJ48AQ	SMAJ48CAQ	53.30	58.90	1	1	48.0	5.2	77.4
SMAJ51AQ	SMAJ51CAQ	56.70	62.70	1	1	51.0	4.9	82.4
SMAJ54AQ	SMAJ54CAQ	60.00	66.30	1	1	54.0	4.6	87.1
SMAJ58AQ	SMAJ58CAQ	64.40	71.20	1	1	58.0	4.3	93.6
SMAJ60AQ	SMAJ60CAQ	66.70	73.70	1	1	60.0	4.1	96.8
SMAJ64AQ	SMAJ64CAQ	71.10	78.60	1	1	64.0	3.9	103.0
SMAJ70AQ	SMAJ70CAQ	77.80	86.00	1	1	70.0	3.5	113.0
SMAJ75AQ	SMAJ75CAQ	83.30	92.10	1	1	75.0	3.3	121.0
SMAJ78AQ	SMAJ78CAQ	86.70	95.80	1	1	78.0	3.2	126.0
SMAJ80AQ	SMAJ80CAQ	88.80	97.60	1	1	80.0	3.1	129.0
SMAJ85AQ	SMAJ85CAQ	94.40	104.00	1	1	85.0	2.9	137.0
SMAJ90AQ	SMAJ90CAQ	100.00	111.00	1	1	90.0	2.7	146.0
SMAJ100AQ	SMAJ100CAQ	111.00	123.00	1	1	100.0	2.5	162.0
SMAJ110AQ	SMAJ110CAQ	122.00	135.00	1	1	110.0	2.3	177.0
SMAJ120AQ	SMAJ120CAQ	133.00	147.00	1	1	120.0	2.1	193.0
SMAJ130AQ	SMAJ130CAQ	144.00	159.00	1	1	130.0	1.9	209.0
SMAJ140AQ	SMAJ140CAQ	155.00	171.00	1	1	140.0	1.8	226.8
SMAJ150AQ	SMAJ150CAQ	167.00	185.00	1	1	150.0	1.7	243.0
SMAJ160AQ	SMAJ160CAQ	178.00	197.00	1	1	160.0	1.5	259.0
SMAJ170AQ	SMAJ170CAQ	189.00	209.00	1	1	170.0	1.5	275.0
SMAJ180AQ	SMAJ180CAQ	200.00	220.00	1	1	180.0	1.4	291.6
SMAJ190AQ	SMAJ190CAQ	211.00	232.00	1	1	190.0	1.3	307.8



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■ Thermal Characteristics (T_a=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Conditions	VALUE
Thermal resistance(Typical)	R _{θJL}	°C/W	junction to lead	30
	R _{θJA}	°C/W	junction to ambient	120

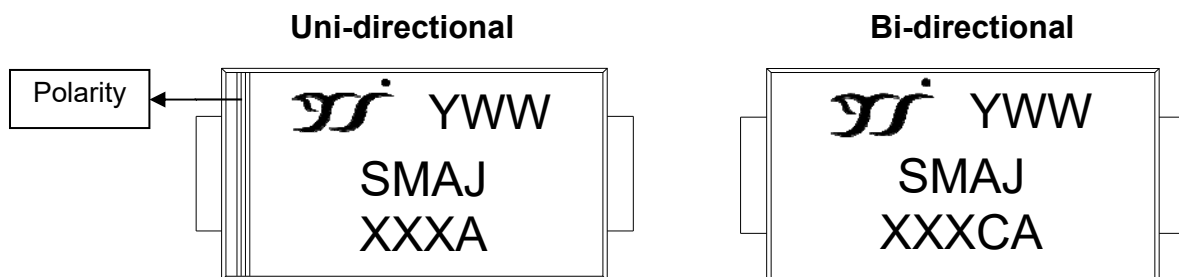
Notes:

- (1) Non-repetitive current pulse, per Fig.3 and derated above T_j = 75°C per Fig.2.
- (2) Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal
- (3) Pulse test: t_p ≤ 50ms
- (4) Surge current waveform per Fig. 3 and derated per Fig.2.

■ Ordering Information (Example)

PREFERRED P/N	PACKAGE CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SMAJ SERIES	F2	Approximate 0.067	7500	120000	13" reel

■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. XXX is marking code, like 190A\190CA marking code is 190
4. Body color: Black
5. YWW is date code, "Y" is year. "WW" is week.

For instance:

The 17th week of 2021, date code is 117

The 17th week of 2022, date code is 217



SMAJ5.0AQ THRU SMAJ190CAQ

■ Characteristics (Typical)

Fig.1 Peak Pulse Power Rating Curve

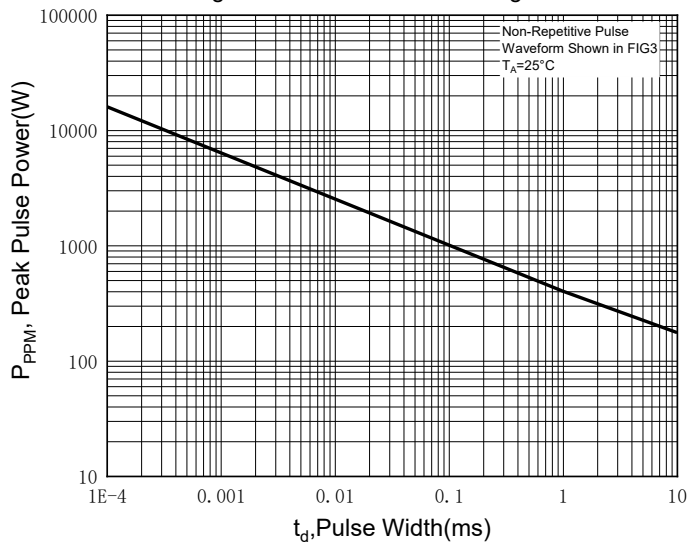


Fig.2 Pulse Power or Current vs. Initial Junction Temperature

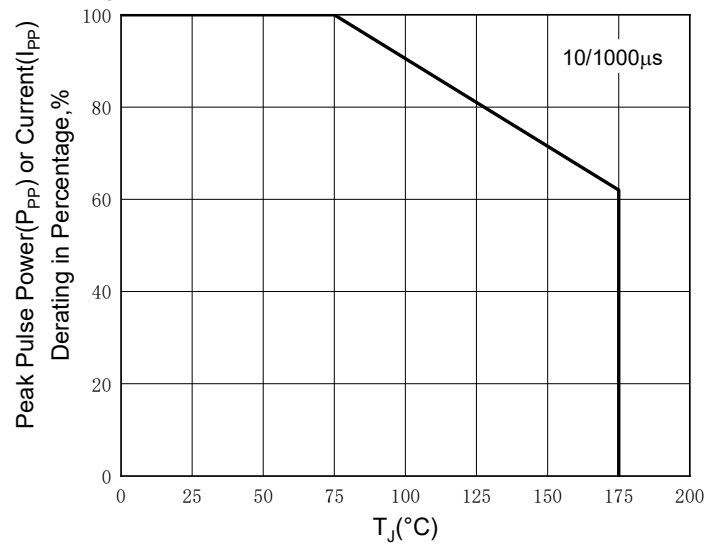


Fig.3 Pulse Waveform

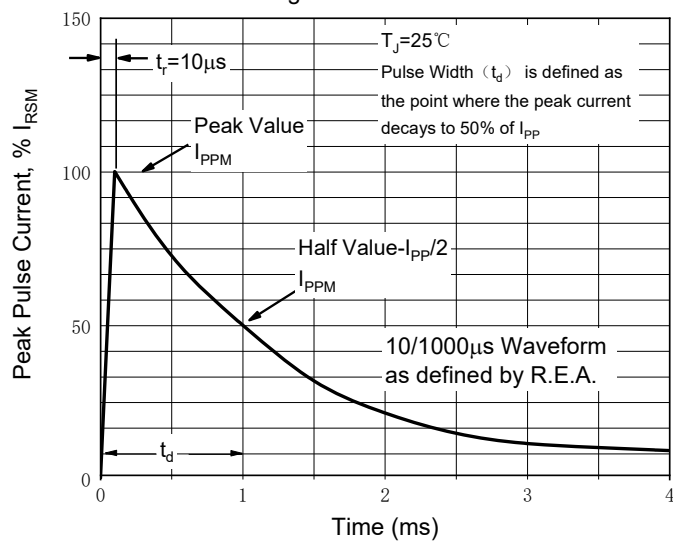


Fig.4 Typical Transient Thermal Impedance

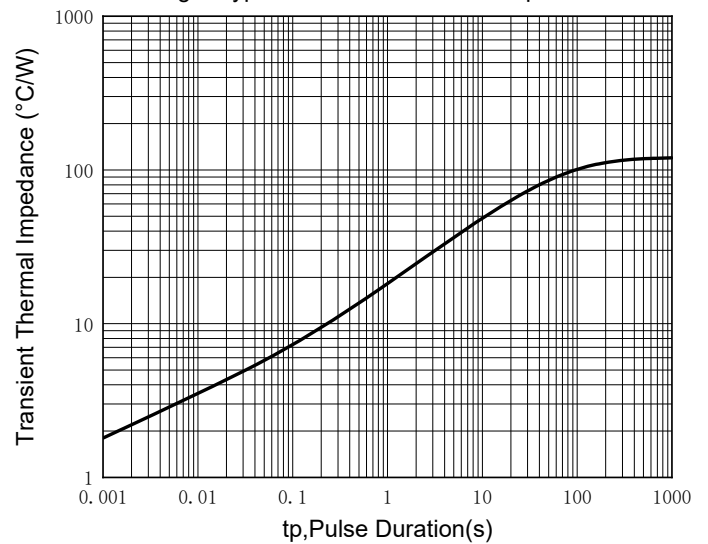
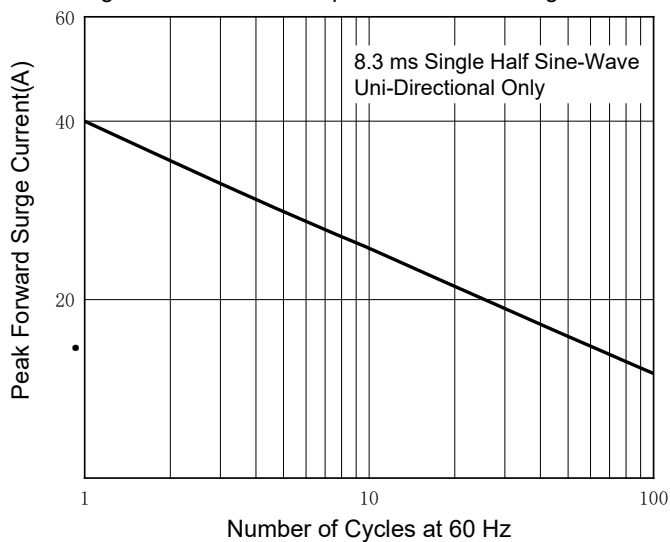


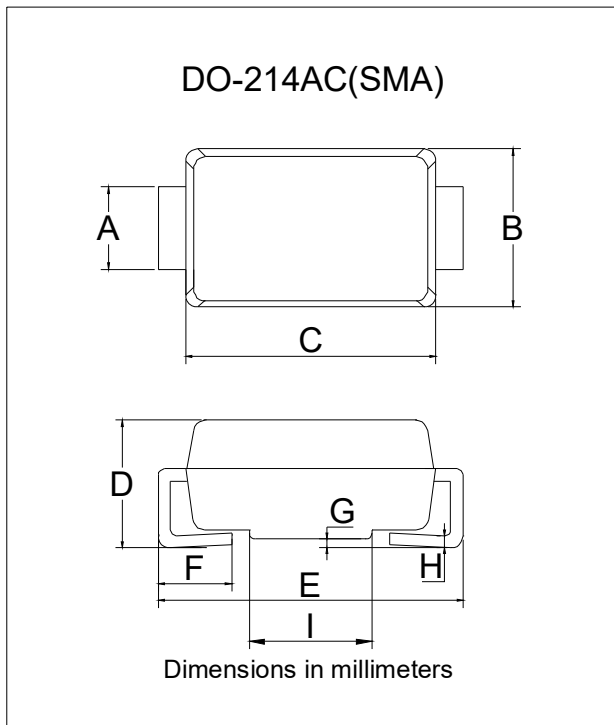
Fig.5 Maximum Non-Repetitive Forward Surge Current





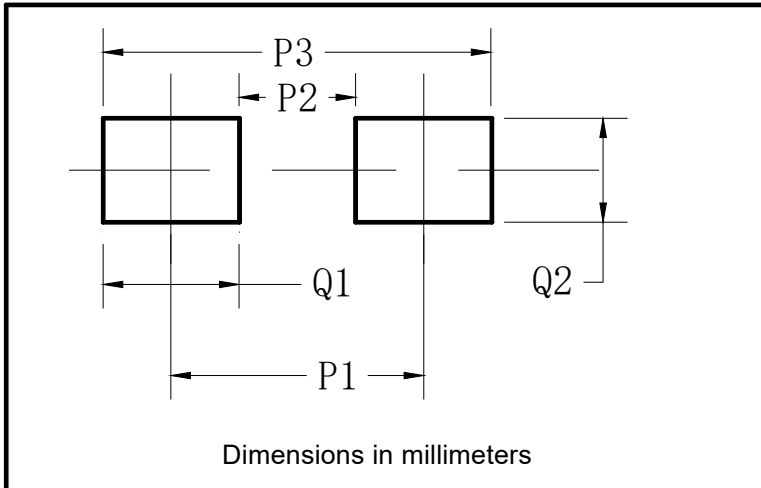
SMAJ5.0AQ THRU SMAJ190CAQ

■ Outline Dimensions



DO-214AC(SMA)		
Dim	Min	Max
A	1.25	1.58
B	2.40	2.83
C	4.00	4.75
D	1.90	2.30
E	4.93	5.28
F	0.76	1.41
G	0.05	0.20
H	0.15	0.31
I	1.7	2.1

■ Suggested Pad Layout



DO-214AC(SMA)	
Dim	Millimeters
P1	4.00
P2	1.50
P3	6.50
Q1	2.50
Q2	1.70



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