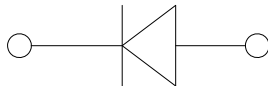
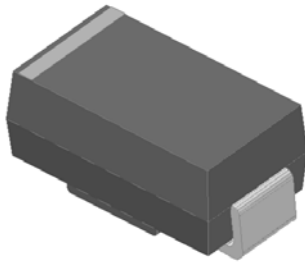


## Surface Mount Transient Voltage Suppressor Diodes

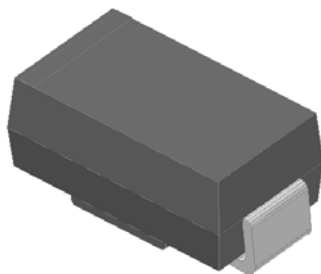
### Uni-directional



### 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  $\mu$ s waveform
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time
- 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<sub>a</sub>=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Max
Peak power dissipation, with a 10/1000us waveform <sup>(1)</sup> <sup>(2)</sup> (Fig.1)	P <sub>PPM</sub>	W	400
Peak pulse current, with a 10/1000us waveform <sup>(1)</sup>	I <sub>PPM</sub>	A	See Next Table
Power dissipation, T <sub>a</sub> =25°C	P <sub>D</sub>	W	1.25
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(2)</sup>	I <sub>FSM</sub>	A	40
Operating junction	T <sub>J</sub>	°C	-55 to +175
Storage temperature range	T <sub>STG</sub>	°C	-55 to +175

### ■Electrical Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Maximum instantaneous forward voltage @ at 25A for unidirectional only <sup>(3)</sup>	V <sub>F</sub>	V	3.5
Maximum instantaneous forward voltage @ at 1A for unidirectional only	V <sub>F</sub>	V	1.5



# P4SMA6.8AQ THRU P4SMA220CAQ

## ■Electrical Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

Part Number (Uni)	Part Number (Bi)	Breakdown Voltage V <sub>BR</sub> @I <sub>T</sub>			Maximum Reverse Leakage I <sub>R</sub> @ V <sub>RWM</sub> (μA)	Working Peak Reverse Voltage V <sub>RWM</sub> (V)	Maximum Reverse Surge Current I <sub>PP</sub> <sup>(5)</sup> (A)	Maximum Clamping Voltage V <sub>c</sub> @ I <sub>PP</sub> (V)
		Min(V)	Max (V)	I <sub>T</sub> <sup>(4)</sup> (mA)				
P4SMA6.8AQ	P4SMA6.8CAQ	6.46	7.14	10	1000	5.8	38.1	10.5
P4SMA7.5AQ	P4SMA7.5CAQ	7.13	7.88	10	500	6.4	35.4	11.3
P4SMA8.2AQ	P4SMA8.2CAQ	7.79	8.61	10	200	7.0	33.1	12.1
P4SMA9.1AQ	P4SMA9.1CAQ	8.65	9.56	1	50	7.8	29.9	13.4
P4SMA10AQ	P4SMA10CAQ	9.50	10.50	1	10	8.6	27.6	14.5
P4SMA11AQ	P4SMA11CAQ	10.45	11.55	1	5	9.4	25.6	15.6
P4SMA12AQ	P4SMA12CAQ	11.40	12.60	1	5	10.2	24.0	16.7
P4SMA13AQ	P4SMA13CAQ	12.35	13.65	1	5	11.1	22.0	18.2
P4SMA15AQ	P4SMA15CAQ	14.25	15.75	1	1	12.8	18.9	21.2
P4SMA16AQ	P4SMA16CAQ	15.20	16.80	1	1	13.6	17.8	22.5
P4SMA18AQ	P4SMA18CAQ	17.10	18.90	1	1	15.3	15.9	25.2
P4SMA20AQ	P4SMA20CAQ	19.00	21.00	1	1	17.1	14.4	27.7
P4SMA22AQ	P4SMA22CAQ	20.90	23.10	1	1	18.8	13.1	30.6
P4SMA24AQ	P4SMA24CAQ	22.80	25.20	1	1	20.5	12.1	33.2
P4SMA27AQ	P4SMA27CAQ	25.65	28.35	1	1	23.1	10.7	37.5
P4SMA30AQ	P4SMA30CAQ	28.50	31.50	1	1	25.6	9.7	41.4
P4SMA33AQ	P4SMA33CAQ	31.35	34.65	1	1	28.2	8.8	45.7
P4SMA36AQ	P4SMA36CAQ	34.20	37.80	1	1	30.8	8.0	49.9
P4SMA39AQ	P4SMA39CAQ	37.05	40.95	1	1	33.3	7.4	53.9
P4SMA43AQ	P4SMA43CAQ	40.85	45.15	1	1	36.8	6.8	59.3
P4SMA47AQ	P4SMA47CAQ	44.65	49.35	1	1	40.2	6.2	64.8
P4SMA51AQ	P4SMA51CAQ	48.45	53.55	1	1	43.6	5.7	70.1
P4SMA56AQ	P4SMA56CAQ	53.20	58.80	1	1	47.8	5.2	77.0
P4SMA62AQ	P4SMA62CAQ	58.90	65.10	1	1	53.0	4.7	85.0
P4SMA68AQ	P4SMA68CAQ	64.60	71.40	1	1	58.1	4.4	92.0
P4SMA75AQ	P4SMA75CAQ	71.25	78.75	1	1	64.1	3.9	103.0
P4SMA82AQ	P4SMA82CAQ	77.90	86.10	1	1	70.1	3.5	113.0
P4SMA91AQ	P4SMA91CAQ	86.45	95.55	1	1	77.8	3.2	125.0
P4SMA100AQ	P4SMA100CAQ	95.00	105.00	1	1	85.5	2.9	137.0
P4SMA110AQ	P4SMA110CAQ	104.50	115.50	1	1	94.0	2.6	152.0
P4SMA120AQ	P4SMA120CAQ	114.00	126.00	1	1	102.0	2.4	165.0
P4SMA130AQ	P4SMA130CAQ	123.50	136.50	1	1	111.0	2.2	179.0
P4SMA150AQ	P4SMA150CAQ	142.50	157.50	1	1	128.0	1.9	207.0
P4SMA160AQ	P4SMA160CAQ	152.00	168.00	1	1	136.0	1.8	219.0
P4SMA170AQ	P4SMA170CAQ	161.50	178.50	1	1	145.0	1.7	234.0
P4SMA180AQ	P4SMA180CAQ	171.00	189.00	1	1	154.0	1.6	246.0
P4SMA200AQ	P4SMA200CAQ	190.00	210.00	1	1	171.0	1.5	274.0
P4SMA220AQ	P4SMA220CAQ	209.00	231.00	1	1	185.0	1.2	328.0



# P4SMA6.8AQ THRU P4SMA220CAQ

## ■ Thermal Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Conditions	VALUE
Thermal resistance(Typical)	R <sub>θJL</sub>	°C/W	junction to lead	30
	R <sub>θJA</sub>		junction to ambient	120

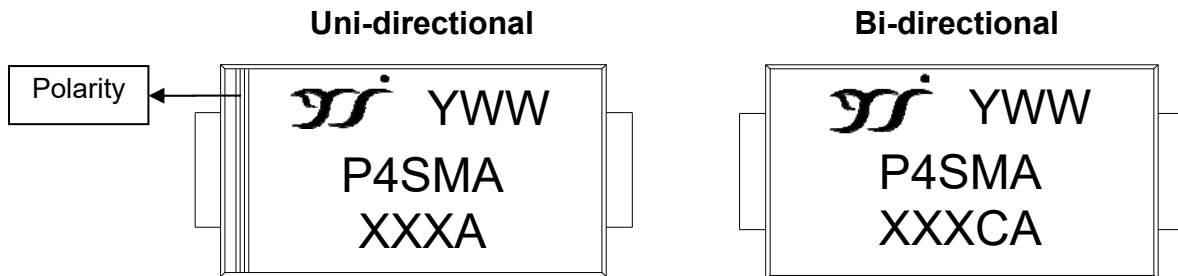
Notes:

- (1) Non-repetitive current pulse, per Fig.3 and derated above T<sub>J</sub>= 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) V<sub>F</sub><3.5V for devices of V<sub>BR</sub><190
- (4) Pulse test: tp≤50ms
- (5) Surge current waveform per Fig.3 and derated per Fig.2.

## ■ Ordering Information (Example)

PREFERED P/N	PACKAGE CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
P4SMA 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 220A/220CA marking code is 220
4. Body color: Black
5. YWW is date code, "Y" is year. "WW" is week.

For instance:

The 17<sup>th</sup> week of 2021, date code is 117

The 17<sup>th</sup> week of 2022, date code is 217



# P4SMA6.8AQ THRU P4SMA220CAQ

## ■ Characteristics (Typical)

Fig.1 Peak Pulse Power Rating Curve

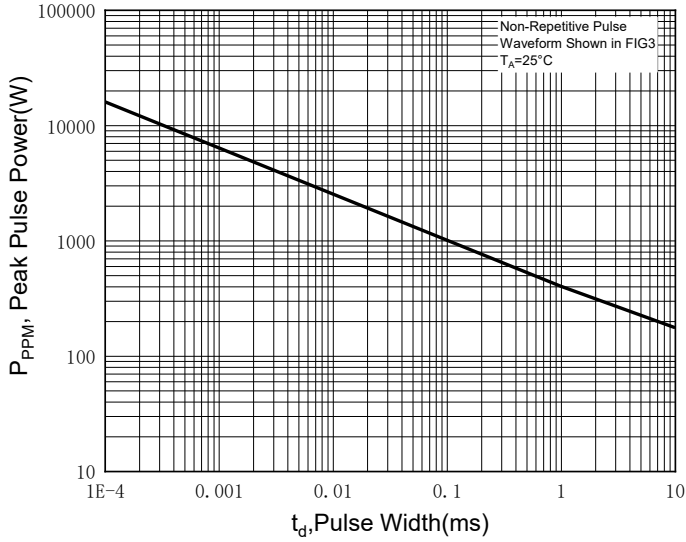


Fig.2 Pulse Power or Current vs. Initial Junction Temperature

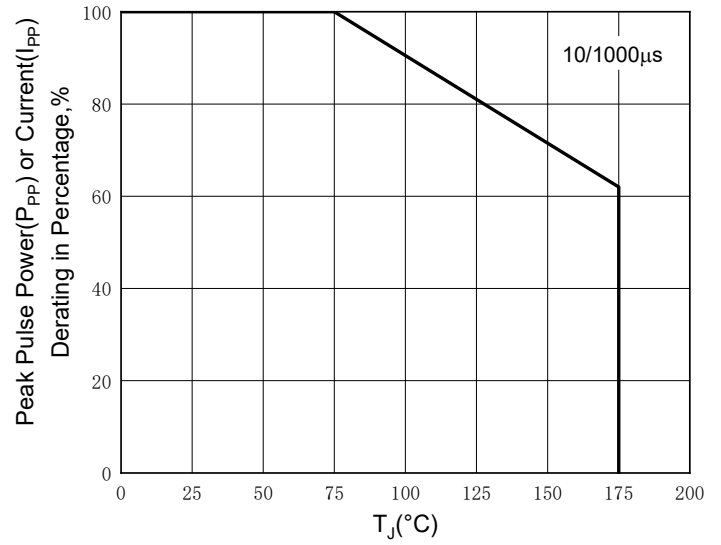


Fig.3 Pulse Waveform

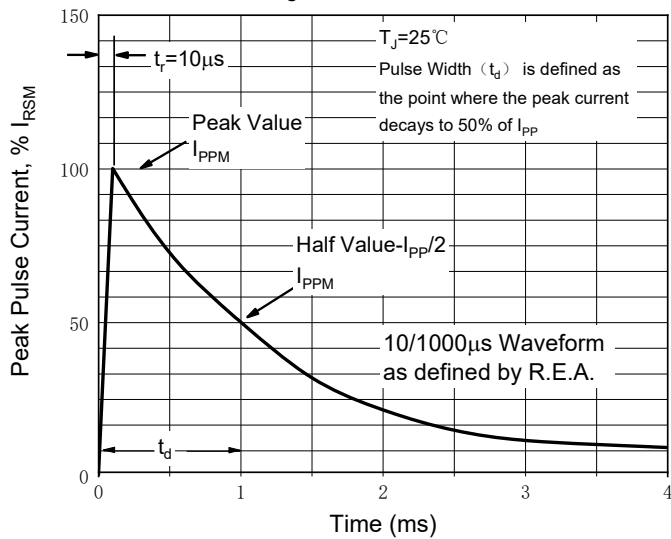


Fig.4 Typical Transient Thermal Impedance

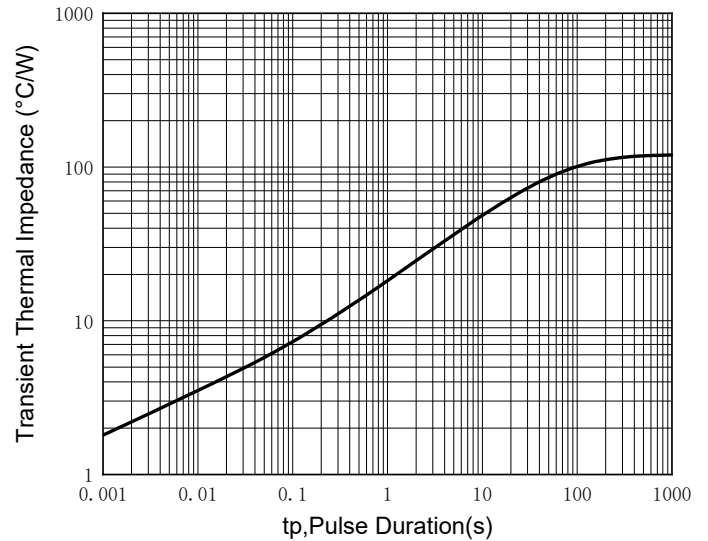
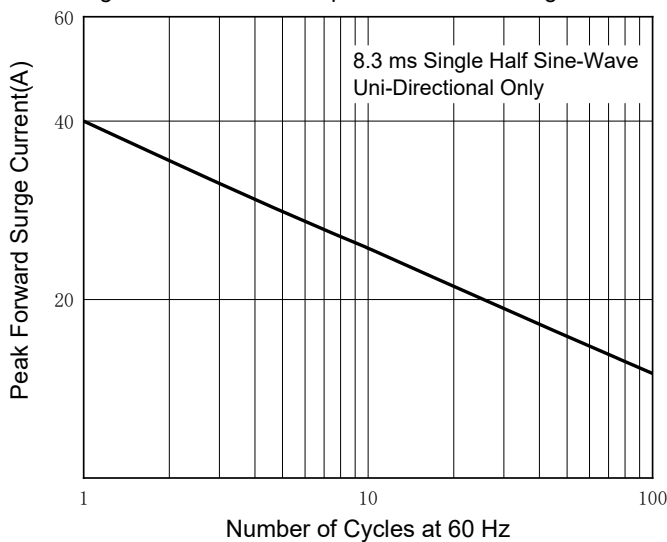


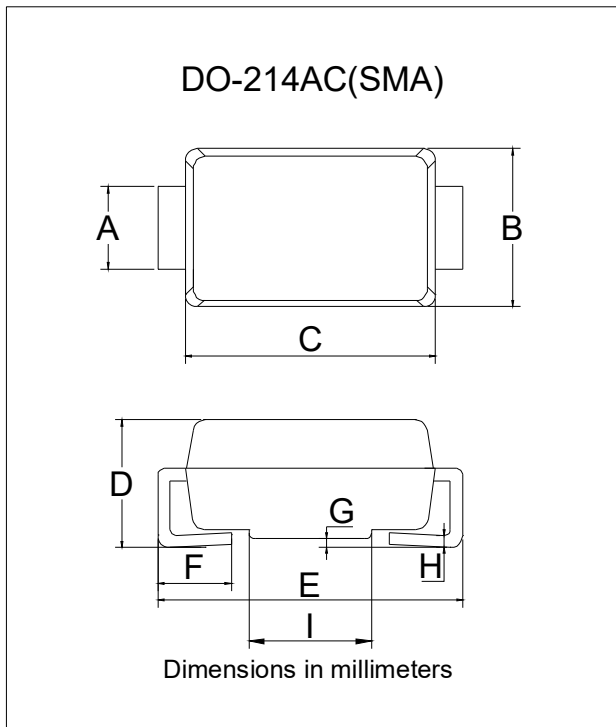
Fig.5 Maximum Non-Repetitive Forward Surge Current





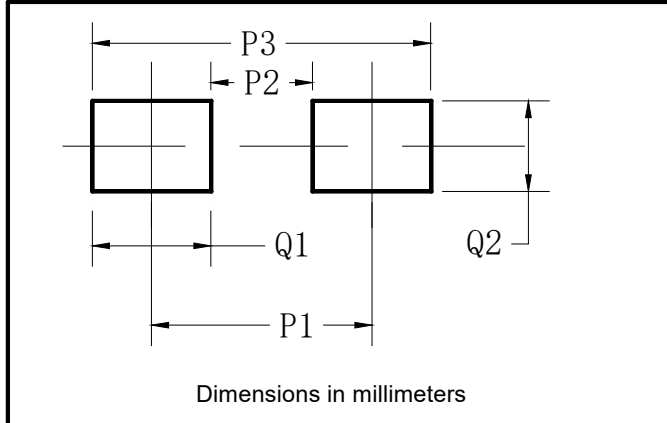
# P4SMA6.8AQ THRU P4SMA220CAQ

## ■ 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



## P4SMA6.8AQ THRU P4SMA220CAQ

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