

# P6SMAJ-Q Series

Surface Mount — 600W

 **AUTOMOTIVE GRADE** **HF** 



SMA

## Additional Information



Resources



Accessories



Samples

## Maximum Ratings and Characteristics ( $T_A=25^{\circ}\text{C}$ )

Rating	Symbol	Value
Peak pulse power dissipation at 10/1000 $\mu\text{s}$ waveform(Note1, Note2, Fig.1)	$P_{PPM}$	600W
Peak pulse current of at 10/1000 $\mu\text{s}$ waveform (Note 1, Fig.3)	$I_{PPM}$	See Table(A)
Steady state power dissipation at $T_A=50^{\circ}\text{C}$ (Fig.5)	$P_{M(AV)}$	5.0W
Maximum Instantaneous Forward Voltage at 25A for Unidirectional Only	$V_F$	3.5V
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6)	$I_{FSM}$	60A
Operating junction and Storage Temperature Ranges	$T_J, T_{STG}$	$-55^{\circ}\text{C}$ to $+150^{\circ}\text{C}$
Typical thermal resistance junction to lead	$R_{\theta JL}$	$30^{\circ}\text{C/W}$
Typical thermal resistance junction to ambient	$R_{\theta JA}$	$120^{\circ}\text{C/W}$

Notes:

1. Non-repetitive current pulse, per Fig.3 and derating above  $T_A=25^{\circ}\text{C}$  per Fig.2.
2. Each terminal is surface Mounted on the 5.0mm $\times$ 5.0mm(0.03mm thick) copper pads.
3. 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minutes maximum.

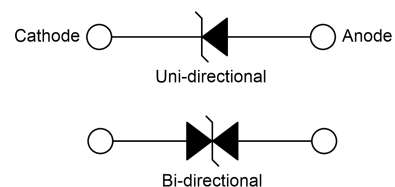
## Description

The P6SMAJ-Q series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events. For surface mounted applications in order to optimize board space.

## Features

- Halogen free and RoHS compliant
- Low profile package
- Built-in strain relief design
- Low inductance
- Excellent clamping capability
- 600W peak pulse power capability at 10/1000 $\mu\text{s}$  waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical  $I_R$  less than 1 $\mu\text{A}$  above 10V devices
- Peak 260  $^{\circ}\text{C}$  high temperature Reflow Soldering withstanding
- Meet MSL level1, per J-STD-020
- IEC-61000-4-2 ESD 30kV(Air), 30kV (Contact)
- Unit Weight: 0.07g
- AEC-Q101 Qualified

## Functional Diagram



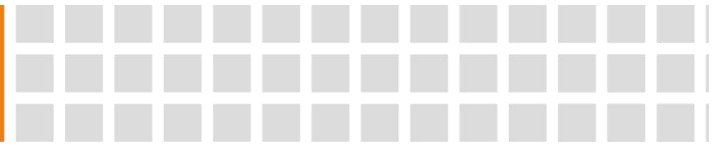
# P6SMAJ-Q Series

Surface Mount — 600W

## Electrical Characteristics (T<sub>A</sub>=25°C)

Part Number		Type	Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I <sub>T</sub>		Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>R</sub>
Uni.	Bi.		Uni.	Bi.	V <sub>R</sub> (V)	V <sub>B Min.</sub> (V)	V <sub>B Max.</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
P6SMAJ5.0A	P6SMAJ5.0CA	Q	KE	AE	5.0	6.40	7.00	10	9.2	65.3	800
P6SMAJ6.0A	P6SMAJ6.0CA	Q	KG	AG	6.0	6.67	7.37	10	10.3	58.3	800
P6SMAJ6.5A	P6SMAJ6.5CA	Q	KK	AK	6.5	7.22	7.98	10	11.2	53.6	500
P6SMAJ7.0A	P6SMAJ7.0CA	Q	KM	AM	7.0	7.78	8.60	10	12.0	50.0	200
P6SMAJ7.5A	P6SMAJ7.5CA	Q	KP	AP	7.5	8.33	9.21	1	12.9	46.6	100
P6SMAJ8.0A	P6SMAJ8.0CA	Q	KR	AR	8.0	8.89	9.83	1	13.6	44.2	50
P6SMAJ8.5A	P6SMAJ8.5CA	Q	KT	AT	8.5	9.44	10.40	1	14.4	41.7	20
P6SMAJ9.0A	P6SMAJ9.0CA	Q	KV	AV	9.0	10.00	11.10	1	15.4	39.0	10
P6SMAJ10A	P6SMAJ10CA	Q	KX	AX	10.0	11.10	12.30	1	17.0	35.3	5
P6SMAJ11A	P6SMAJ11CA	Q	KZ	AZ	11.0	12.20	13.50	1	18.2	33.0	1
P6SMAJ12A	P6SMAJ12CA	Q	LE	BE	12.0	13.30	14.70	1	19.9	30.2	1
P6SMAJ13A	P6SMAJ13CA	Q	LG	BG	13.0	14.40	15.90	1	21.5	28.0	1
P6SMAJ14A	P6SMAJ14CA	Q	LK	BK	14.0	15.60	17.20	1	23.2	25.9	1
P6SMAJ15A	P6SMAJ15CA	Q	LM	BM	15.0	16.70	18.50	1	24.4	24.6	1
P6SMAJ16A	P6SMAJ16CA	Q	LP	BP	16.0	17.80	19.70	1	26.0	23.1	1
P6SMAJ17A	P6SMAJ17CA	Q	LR	BR	17.0	18.90	20.90	1	27.6	21.8	1
P6SMAJ18A	P6SMAJ18CA	Q	LT	BT	18.0	20.00	22.10	1	29.2	20.6	1
P6SMAJ20A	P6SMAJ20CA	Q	LV	BV	20.0	22.20	24.50	1	32.4	18.6	1
P6SMAJ22A	P6SMAJ22CA	Q	LX	BX	22.0	24.40	26.90	1	35.5	16.9	1
P6SMAJ24A	P6SMAJ24CA	Q	LZ	BZ	24.0	26.70	29.50	1	38.9	15.5	1
P6SMAJ26A	P6SMAJ26CA	Q	ME	CE	26.0	28.90	31.90	1	42.1	14.3	1
P6SMAJ28A	P6SMAJ28CA	Q	MG	CG	28.0	31.10	34.40	1	45.4	13.3	1
P6SMAJ30A	P6SMAJ30CA	Q	MK	CK	30.0	33.30	36.80	1	48.4	12.4	1
P6SMAJ33A	P6SMAJ33CA	Q	MM	CM	33.0	36.70	40.60	1	53.3	11.3	1
P6SMAJ36A	P6SMAJ36CA	Q	MP	CP	36.0	40.00	44.20	1	58.1	10.4	1
P6SMAJ40A	P6SMAJ40CA	Q	MR	CR	40.0	44.40	49.10	1	64.5	9.3	1

**P6SMAJ-Q Series**  
Surface Mount — 600W



Part Number		Type	Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @ $I_T$		Test Current	Maximum Clamping Voltage @ $I_{PP}$	Peak Pulse Current	Reverse Leakage @ $V_R$
Uni.	Bi.		Uni.	Bi.	$V_R$ (V)	$V_{B Min.}$ (V)	$V_{B Max.}$ (V)	$I_T$ (mA)	$V_C$ (V)	$I_{PP}$ (A)	$I_R$ ( $\mu$ A)
P6SMAJ43A	P6SMAJ43CA	Q	MT	CT	43.0	47.80	52.80	1	69.4	8.7	1
P6SMAJ45A	P6SMAJ45CA	Q	MV	CV	45.0	50.00	55.30	1	72.7	8.3	1
P6SMAJ48A	P6SMAJ48CA	Q	MX	CX	48.0	53.30	58.90	1	77.4	7.8	1
P6SMAJ51A	P6SMAJ51CA	Q	MZ	CZ	51.0	56.70	62.70	1	82.4	7.3	1
P6SMAJ54A	P6SMAJ54CA	Q	NE	DE	54.0	60.00	66.30	1	87.1	6.9	1
P6SMAJ58A	P6SMAJ58CA	Q	NG	DG	58.0	64.40	71.20	1	93.6	6.5	1

**P6SMAJ-Q Series**  
Surface Mount — 600W

**Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$ )**

Figure 1. Peak Pulse Power Rating Curve

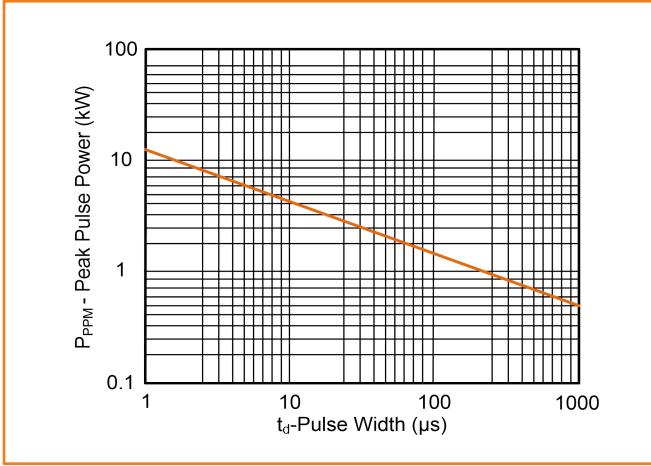


Figure 2. Pulse Derating Curve

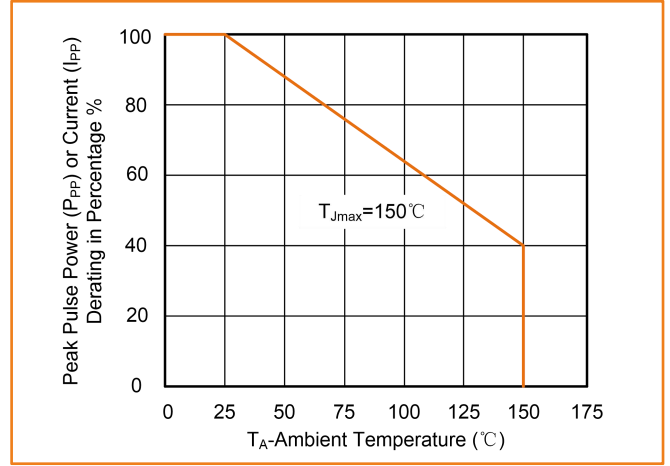


Figure 3. Pulse Waveform

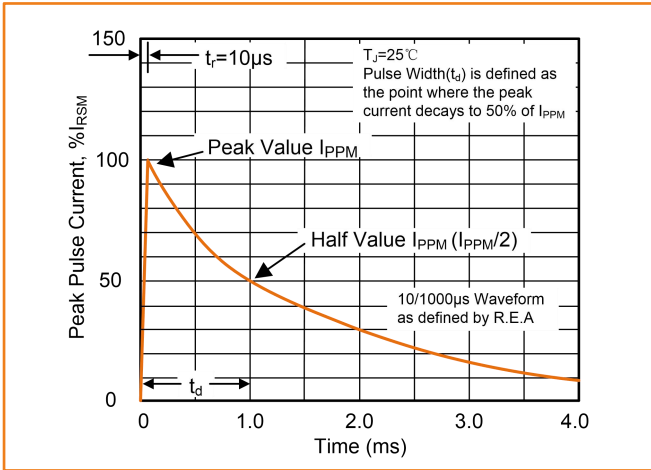


Figure 4. Typical Junction Capacitance

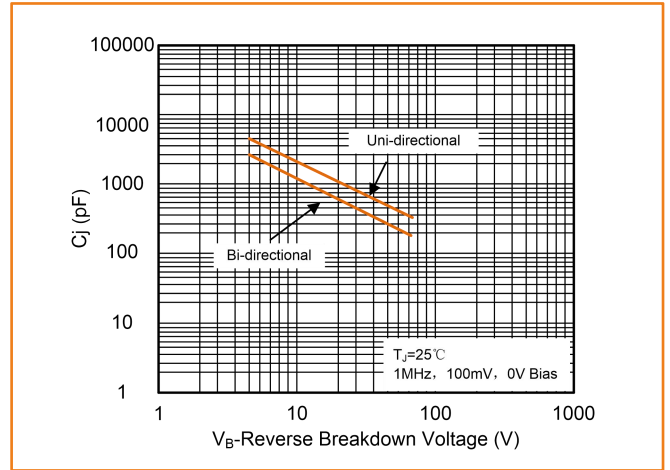


Figure 5. Steady State Power Dissipation Derating Curve

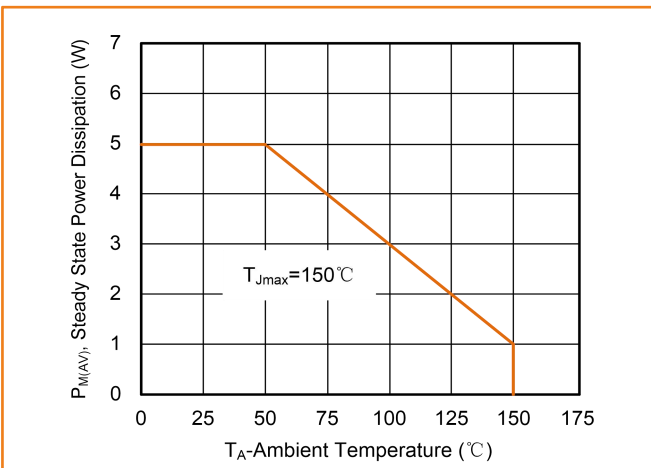
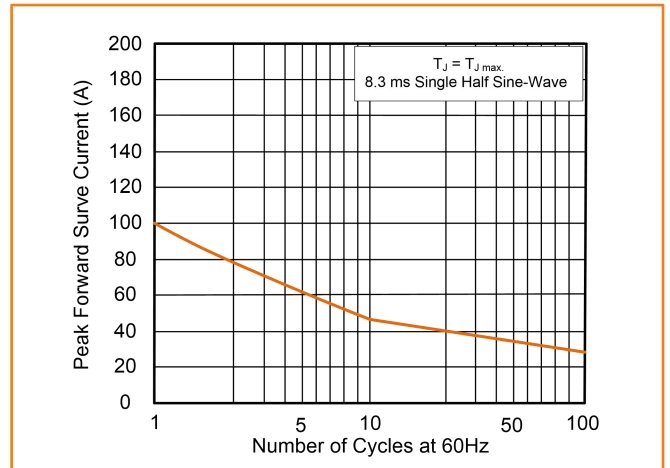


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional

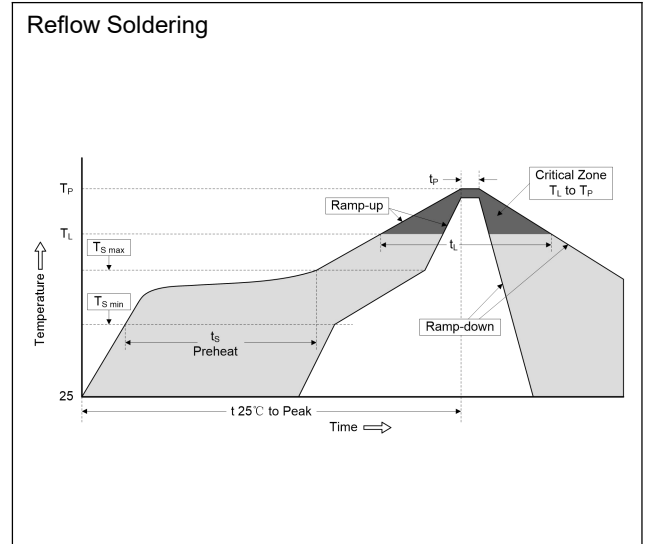


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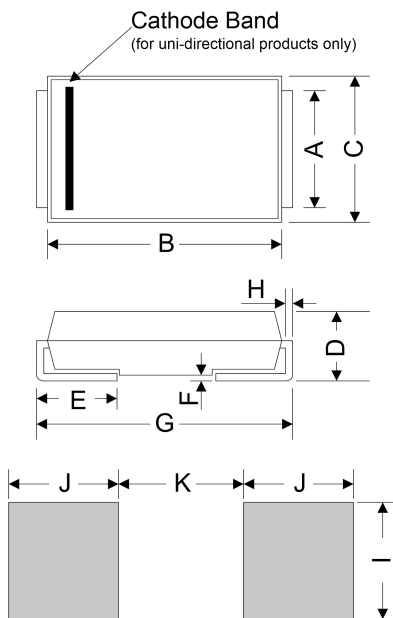
Surface Mount — 600W

## Soldering Parameters

Reflow Condition		Lead-free
Pre Heat	-Temperature Min ( $T_{S\ min}$ )	150°C
	-Temperature Max ( $T_{S\ max}$ )	200°C
	-Time (min to max) ( $t_s$ )	60 — 180 secs
Average ramp-up rate ( $T_L$ to $T_P$ )		3°C/second max.
$T_{S\ max}$ to $T_L$ -Ramp-up Rate		3°C/second max.
Time maintained above:	-Temperature ( $T_L$ )	217°C
	-Time ( $t_L$ )	60-150 seconds
Peak Temperature ( $T_P$ )		260°C
Time within 5°C of actual Peak Temperature ( $t_p$ )		20-40 seconds
Ramp-down Rate		6°C/second max.
Time 25°C to Peak Temperature		8 minutes max.



## Dimensions (SMA/DO-214AC)

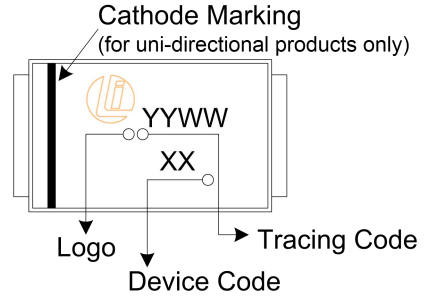
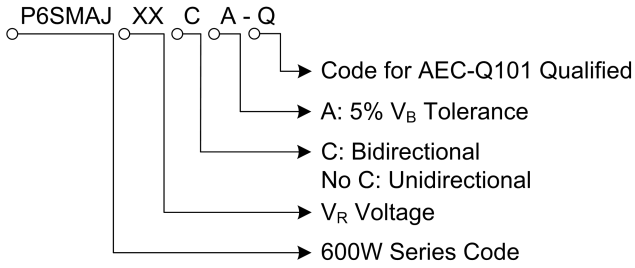


Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.250	1.650	0.049	0.065
B	3.990	4.600	0.157	0.181
C	2.400	2.790	0.095	0.110
D	1.900	2.290	0.075	0.090
E	0.780	1.520	0.030	0.060
F	-	0.203	-	0.008
G	4.800	5.280	0.189	0.208
H	0.152	0.305	0.006	0.012
I	1.800	-	0.070	-
J	2.100	-	0.082	-
K	-	2.300	-	0.090

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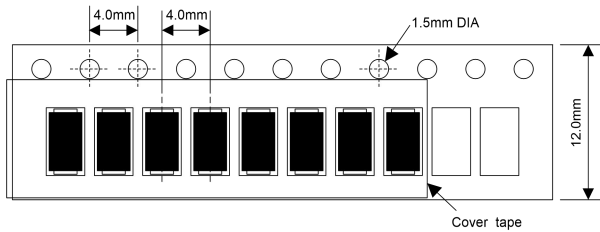
Surface Mount — 600W

## Part Number Code and Marking Code

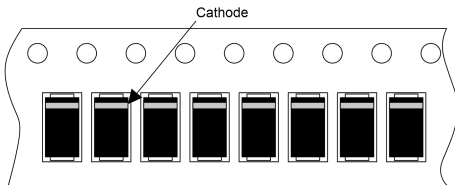


## Packaging Specification

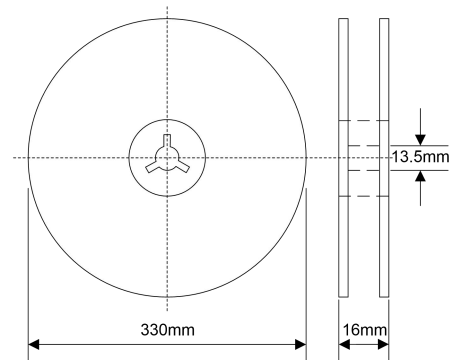
### Tape



### For Uni-Devices



### 13 Inches Reel



Quantity: 5000pcs/reel

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