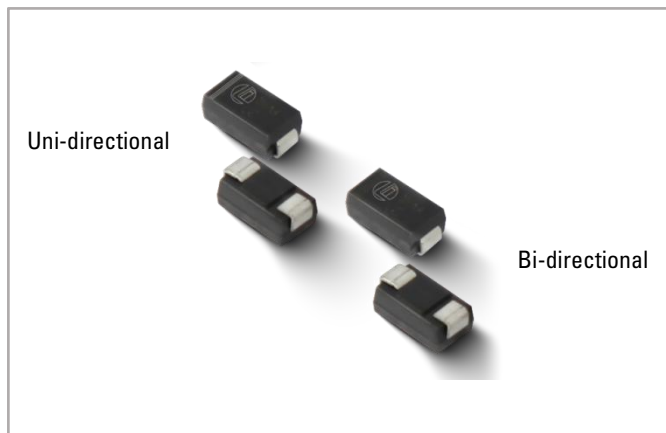


P6SMAJ Series

Surface Mount – 600W



Additional Information



Resources



Accessories



Samples

Maximum Ratings and Thermal Characteristics

($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000 μs Waveform(Fig.1)(Note 1)(Note 2) -Single Die Parts	P_{PPM}	600	W
Power Dissipation on Infinite Heat Sink at $T_L=50^{\circ}\text{C}$	P_D	5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	I_{FSM}	60	A
Maximum Instantaneous Forward Voltage at 25A for Unidirectional Only	V_F	3.5	V
Operating Temperature Range	T_J	-55 to 150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}\text{C}$
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	30	$^{\circ}\text{C}/\text{W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	120	$^{\circ}\text{C}/\text{W}$

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above T_J (initial) $=25^{\circ}\text{C}$ per Fig.2.
2. Mounted on 5.0x5.0mm copper pad to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.

Description

The P6SMAJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

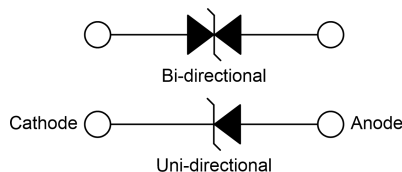
Features

- 600W peak pulse power capability at 10/1000 μs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical I_R less than 1 μA when V_B min>10V
- Surface mount footprint for compact PCB layout
- Low profile package
- Typical failure mode due to exceeding maximum ratings is a short circuit condition
- Whisker test conducted based on Table 4a and 4c of JEDEC JESD201A
- ESD protection of data lines in accordance with IEC 61000-4-2, 30kV(Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- Built-in strain relief
- Fast response time: typically less than 1.0ps from 0V to V_B min
- High temperature to reflow soldering guaranteed: 260 $^{\circ}\text{C}$ /20~40sec.
- $V_B @ T_J = V_B @ 25^{\circ}\text{C} \times (1 + \alpha T_J - 25)$ (α T:Temperature Coefficient, typical value is 0.1%)
- Meet MSL level1, per J-STD-020, LF maximum peak of 260 $^{\circ}\text{C}$
- Matte tin, lead-free plated
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD 609A.01)

Applications

TVS devices are ideal for the protection of I/O Interfaces, V_{CC} bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Functional Diagram



P6SMAJ Series

Surface Mount – 600W

Electrical Characteristics (T_A=25°C unless otherwise noted)

Part Number		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 (μA)
P6SMAJ5.0A	P6SMAJ5.0CA	KE	AE	5.0	6.40	7.00	10	9.2	65.3	800
P6SMAJ6.0A	P6SMAJ6.0CA	KG	AG	6.0	6.67	7.37	10	10.3	58.3	800
P6SMAJ6.5A	P6SMAJ6.5CA	KK	AK	6.5	7.22	7.98	10	11.2	53.6	500
P6SMAJ7.0A	P6SMAJ7.0CA	KM	AM	7.0	7.78	8.60	10	12.0	50.0	200
P6SMAJ7.5A	P6SMAJ7.5CA	KP	AP	7.5	8.33	9.21	1	12.9	46.6	100
P6SMAJ8.0A	P6SMAJ8.0CA	KR	AR	8.0	8.89	9.83	1	13.6	44.2	50
P6SMAJ8.5A	P6SMAJ8.5CA	KT	AT	8.5	9.44	10.40	1	14.4	41.7	20
P6SMAJ9.0A	P6SMAJ9.0CA	KV	AV	9.0	10.00	11.10	1	15.4	39.0	10
P6SMAJ10A	P6SMAJ10CA	KX	AX	10.0	11.10	12.30	1	17.0	35.3	5
P6SMAJ11A	P6SMAJ11CA	KZ	AZ	11.0	12.20	13.50	1	18.2	33.0	1
P6SMAJ12A	P6SMAJ12CA	LE	BE	12.0	13.30	14.70	1	19.9	30.2	1
P6SMAJ13A	P6SMAJ13CA	LG	BG	13.0	14.40	15.90	1	21.5	28.0	1
P6SMAJ14A	P6SMAJ14CA	LK	BK	14.0	15.60	17.20	1	23.2	25.9	1
P6SMAJ15A	P6SMAJ15CA	LM	BM	15.0	16.70	18.50	1	24.4	24.6	1
P6SMAJ16A	P6SMAJ16CA	LP	BP	16.0	17.80	19.70	1	26.0	23.1	1
P6SMAJ17A	P6SMAJ17CA	LR	BR	17.0	18.90	20.90	1	27.6	21.8	1
P6SMAJ18A	P6SMAJ18CA	LT	BT	18.0	20.00	22.10	1	29.2	20.6	1
P6SMAJ20A	P6SMAJ20CA	LV	BV	20.0	22.20	24.50	1	32.4	18.6	1
P6SMAJ22A	P6SMAJ22CA	LX	BX	22.0	24.40	26.90	1	35.5	16.9	1
P6SMAJ24A	P6SMAJ24CA	LZ	BZ	24.0	26.70	29.50	1	38.9	15.5	1
P6SMAJ26A	P6SMAJ26CA	ME	CE	26.0	28.90	31.90	1	42.1	14.3	1
P6SMAJ28A	P6SMAJ28CA	MG	CG	28.0	31.10	34.40	1	45.4	13.3	1
P6SMAJ30A	P6SMAJ30CA	MK	CK	30.0	33.30	36.80	1	48.4	12.4	1
P6SMAJ33A	P6SMAJ33CA	MM	CM	33.0	36.70	40.60	1	53.3	11.3	1
P6SMAJ36A	P6SMAJ36CA	MP	CP	36.0	40.00	44.20	1	58.1	10.4	1
P6SMAJ40A	P6SMAJ40CA	MR	CR	40.0	44.40	49.10	1	64.5	9.3	1
P6SMAJ43A	P6SMAJ43CA	MT	CT	43.0	47.80	52.80	1	69.4	8.7	1
P6SMAJ45A	P6SMAJ45CA	MV	CV	45.0	50.00	55.30	1	72.7	8.3	1
P6SMAJ48A	P6SMAJ48CA	MX	CX	48.0	53.30	58.90	1	77.4	7.8	1
P6SMAJ51A	P6SMAJ51CA	MZ	CZ	51.0	56.70	62.70	1	82.4	7.3	1
P6SMAJ54A	P6SMAJ54CA	NE	DE	54.0	60.00	66.30	1	87.1	6.9	1
P6SMAJ58A	P6SMAJ58CA	NG	DG	58.0	64.40	71.20	1	93.6	6.5	1

Notes:

For bidirectional type having V_R of 10 volts and less, the I_R limit is double.

V_B @ T_J = V_B@25°C x (1+αT x (T_J - 25)) (αT: Temperature Coefficient)

P6SMAJ Series

Surface Mount – 600W

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

Figure 1:
Peak Pulse Power Rating Curve

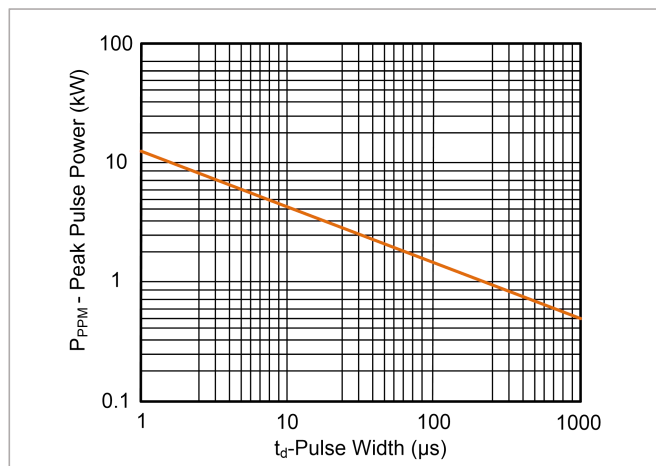


Figure 2:
Pulse Derating Curve

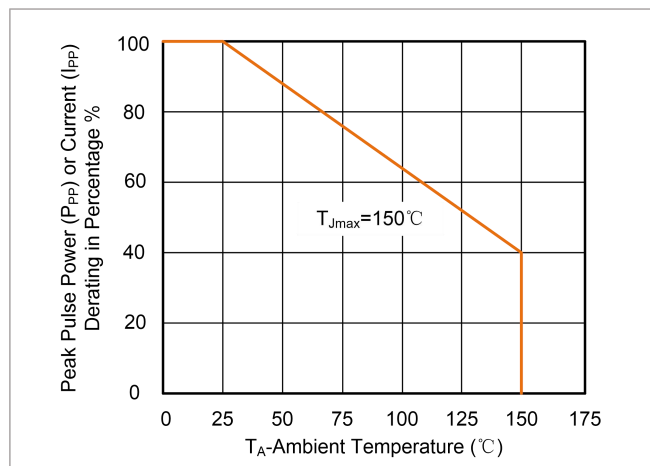


Figure 3:
Pulse Waveform

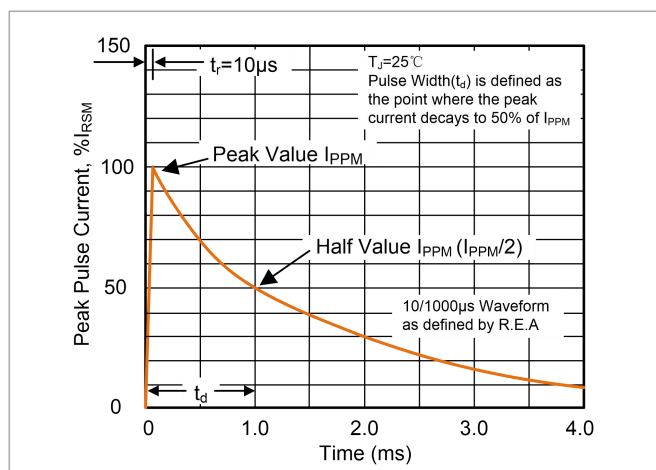


Figure 4:
Typical Junction Capacitance

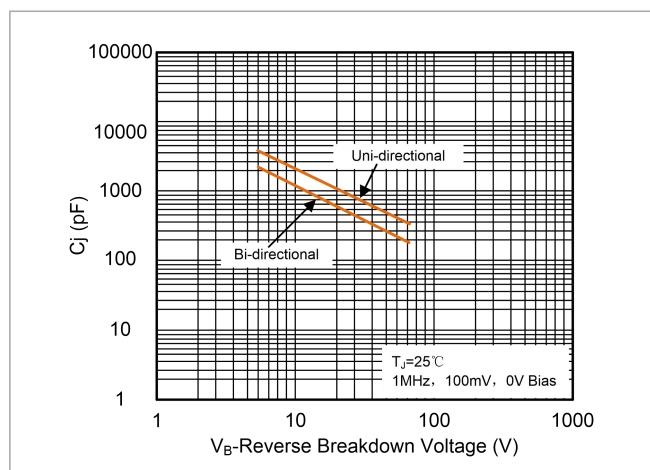


Figure 5:
Steady State Power Dissipation Derating Curve

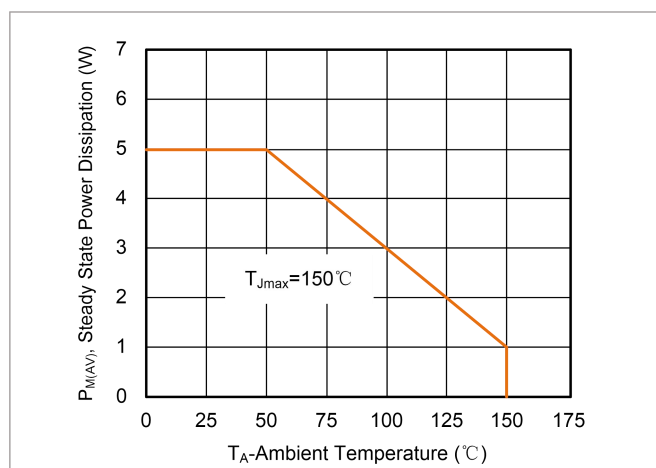
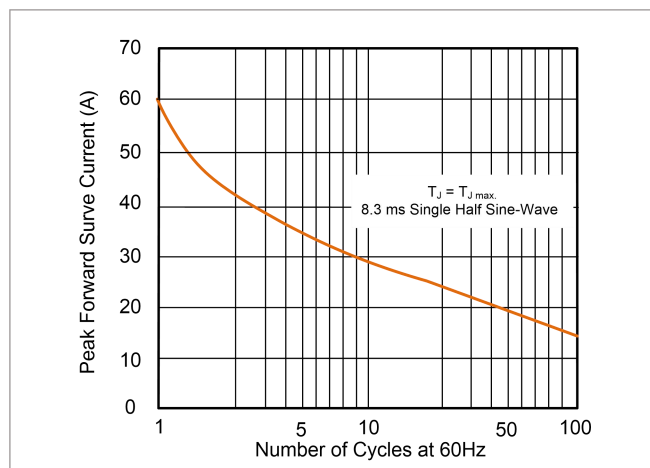


Figure 6:
Maximum Non-Repetitive Forward Surge Current Uni-Directional

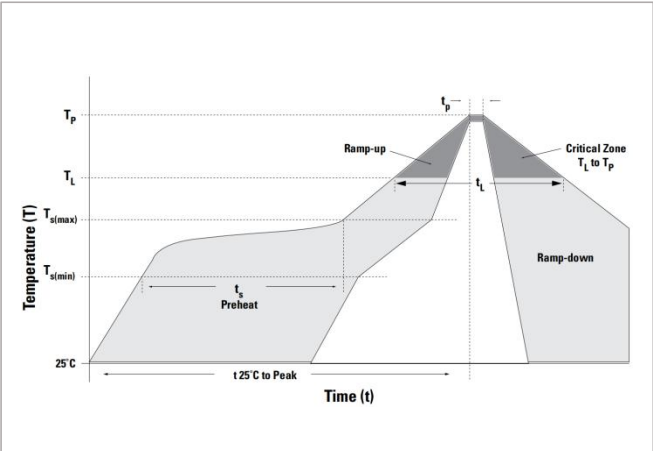


P6SMAJ Series

Surface Mount – 600W

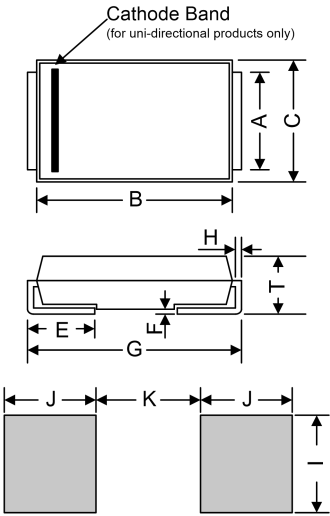
Soldering Parameters

Reflow Condition		Lead-free assembly
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(Liquidus Temp (T_L) to peak		3°C/second max.
$T_{S\ (max)}$ to T_L -Ramp-up Rate		3°C/second max.
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Time (min to max) (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.
Do not exceed		260°C



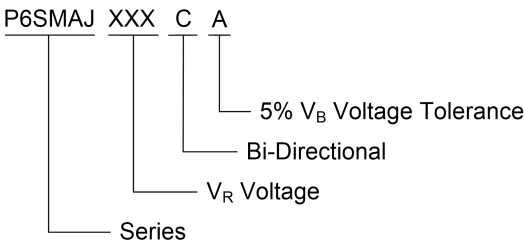
Dimensions

DO-214AC (SMA)

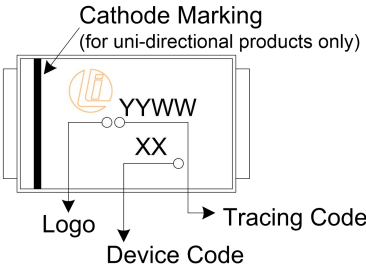


Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.250	1.650	0.049	0.065
B	3.990	4.600	0.157	0.181
C	2.400	2.790	0.095	0.110
E	0.780	1.520	0.030	0.060
F	-	0.203	-	0.008
G	4.800	5.280	0.189	0.208
H	0.152	0.305	0.006	0.012
T	1.900	2.290	0.075	0.090
I	1.800	-	0.070	-
J	2.100	-	0.082	-
K	-	2.300	-	0.090

Part Numbering System



Part Marking System



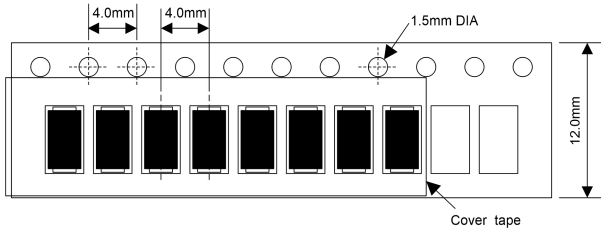
P6SMAJ Series
Surface Mount – 600W

Packaging

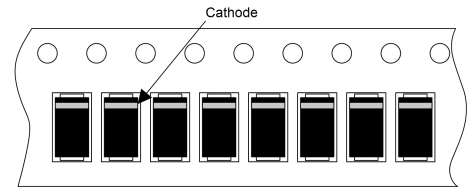
Part number	Component Package	Quantity	Packaging Option	Packaging Specification
P6SMAJxxxXX	DO-214AC	5000	Tape & Reel - 12mm tape/13" reel	EIA STD RS-481

Tape and Reel Specification

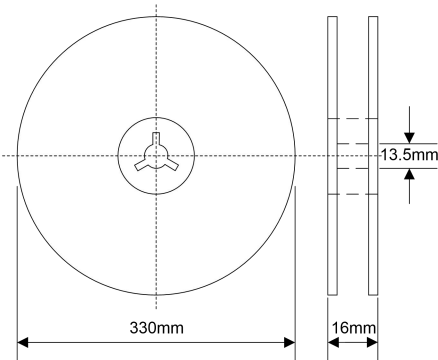
Tape



For Uni-Devices



13 Inches Reel



Quantity: 5000pcs/reel

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