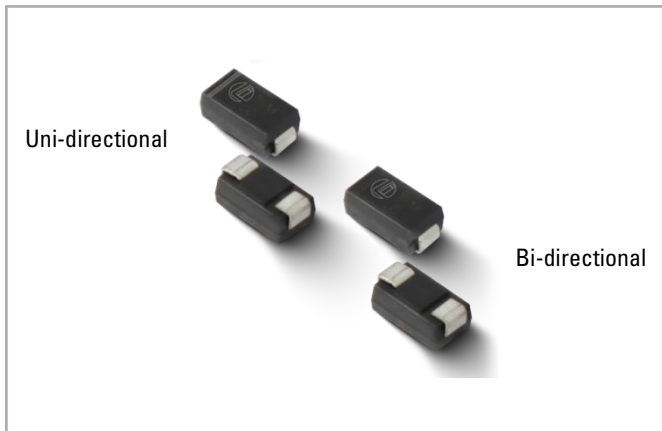


P6SMA Series

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 P6SMA series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

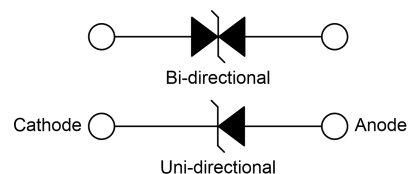
Features

- 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 $V_B \text{ min} > 12\text{V}$
- 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 JEDECJESD201A
- 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 $V_B \text{ mi}$
- High temperature to reflow soldering guaranteed: 260 $^{\circ}\text{C}/20\sim 40\text{sec}$.
- $V_B @ T_J = V_B @ 25^{\circ}\text{C} \times (1 + \alpha T_x (T_J - 25))$ (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



P6SMA Series

Surface Mount – 600W

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ 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)	$V_{B\text{ Min.}}$ (V)	$V_{B\text{ Max.}}$ (V)	I_T (mA)	V_c (V)	I_{PP} (A)	I_R (μ A)
P6SMA6.8A	P6SMA6.8CA	6V8A•	6V8C•	5.80	6.45	7.14	10	10.5	58.1	1000
P6SMA7.5A	P6SMA7.5CA	7V5A•	7V5C•	6.40	7.13	7.88	10	11.3	54.0	500
P6SMA8.2A	P6SMA8.2CA	8V2A•	8V2C•	7.02	7.79	8.61	10	12.1	50.4	200
P6SMA9.1A	P6SMA9.1CA	9V1A•	9V1C•	7.78	8.65	9.55	1	13.4	45.5	50
P6SMA10A	P6SMA10CA	10A•	10C•	8.55	9.50	10.50	1	14.5	42.1	10
P6SMA11A	P6SMA11CA	11A•	11C•	9.40	10.50	11.60	1	15.6	39.1	5
P6SMA12A	P6SMA12CA	12A•	12C•	10.20	11.40	12.60	1	16.7	36.5	5
P6SMA13A	P6SMA13CA	13A•	13C•	11.10	12.40	13.70	1	18.2	33.5	1
P6SMA15A	P6SMA15CA	15A•	15C•	12.80	14.30	15.80	1	21.2	28.8	1
P6SMA16A	P6SMA16CA	16A•	16C•	13.60	15.20	16.80	1	22.5	27.1	1
P6SMA18A	P6SMA18CA	18A•	18C•	15.30	17.10	18.90	1	25.2	24.2	1
P6SMA20A	P6SMA20CA	20A•	20C•	17.10	19.00	21.00	1	27.7	22.0	1
P6SMA22A	P6SMA22CA	22A•	22C•	18.80	20.90	23.10	1	30.6	19.9	1
P6SMA24A	P6SMA24CA	24A•	24C•	20.50	22.80	25.20	1	33.2	18.4	1
P6SMA27A	P6SMA27CA	27A•	27C•	23.10	25.70	28.40	1	37.5	16.3	1
P6SMA30A	P6SMA30CA	30A•	30C•	25.60	28.50	31.50	1	41.4	14.7	1
P6SMA33A	P6SMA33CA	33A•	33C•	28.20	31.40	34.70	1	45.7	13.2	1
P6SMA36A	P6SMA36CA	36A•	36C•	30.80	34.20	37.80	1	49.9	12.2	1
P6SMA39A	P6SMA39CA	39A•	39C•	33.30	37.10	41.00	1	53.9	11.3	1
P6SMA43A	P6SMA43CA	43A•	43C•	36.80	40.90	45.20	1	59.3	10.3	1
P6SMA47A	P6SMA47CA	47A•	47C•	40.20	44.70	49.40	1	64.8	9.4	1

Notes:

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

$V_B @ T_j = V_B @ 25^{\circ}\text{C} \times (1 + \alpha T \times (T_j - 25))$ (αT : Temperature Coefficient)

P6SMA Series
Surface Mount – 600W

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

Figure 1:
Peak Pulse Power Rating Curve

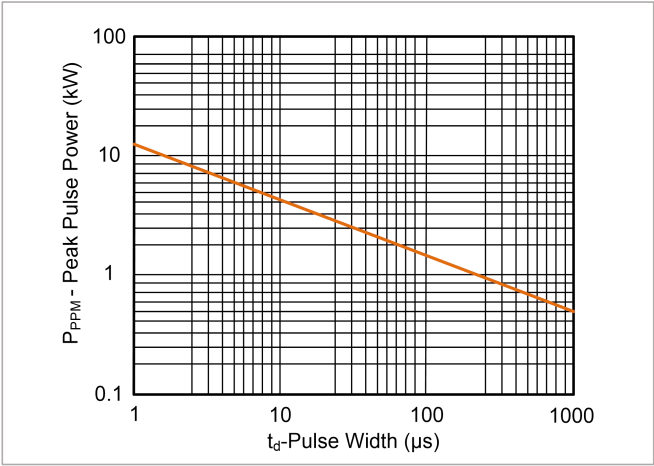


Figure 2:
Pulse Derating Curve

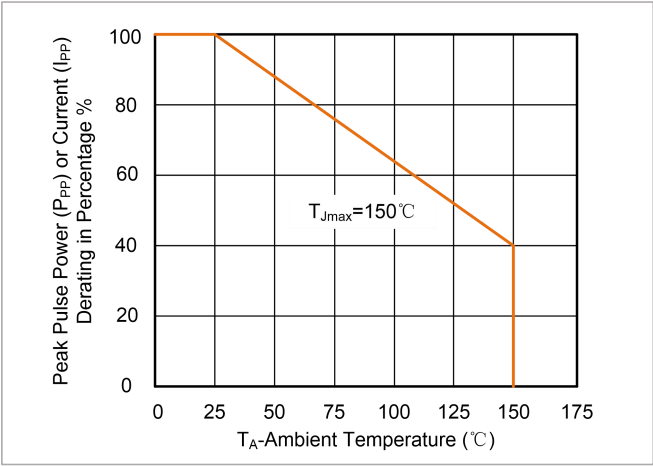


Figure 3:
Pulse Waveform

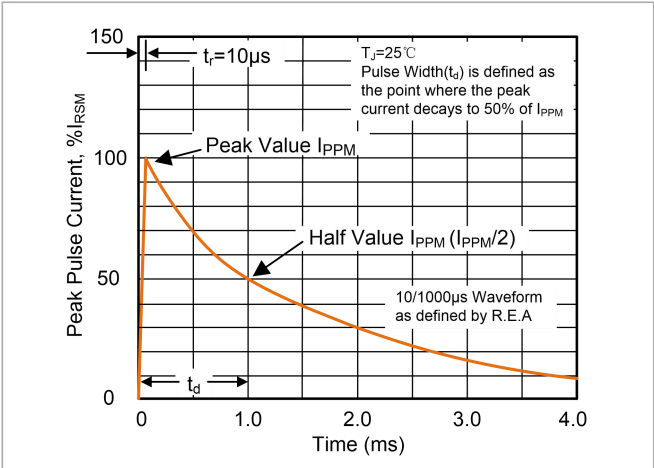


Figure 4:
Typical Junction Capacitance

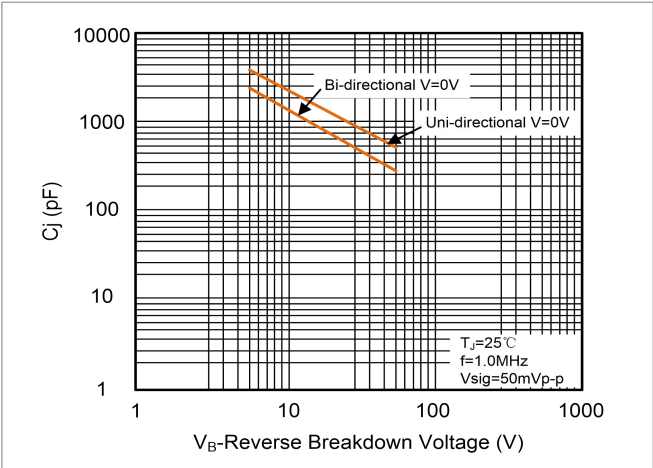


Figure 5:
Steady State Power Dissipation Derating Curve

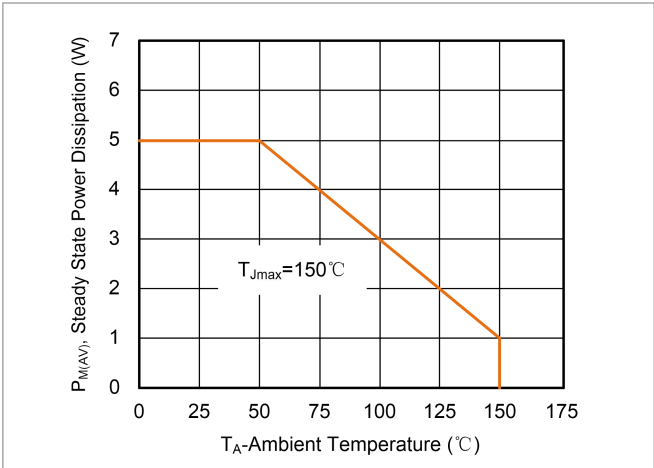
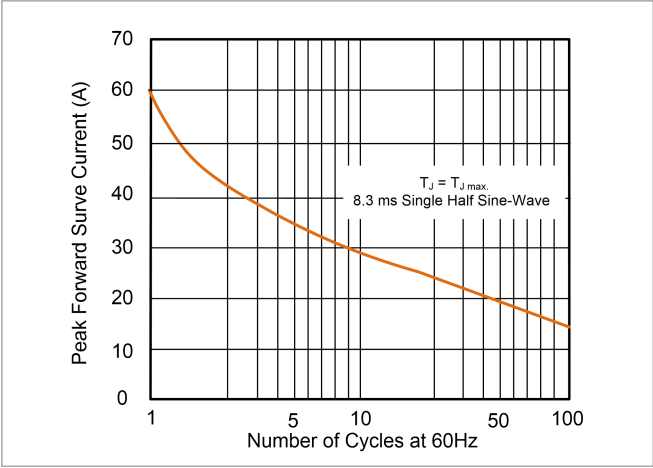


Figure 6:
Maximum Non-Repetitive Forward Surge Current Uni-Directional

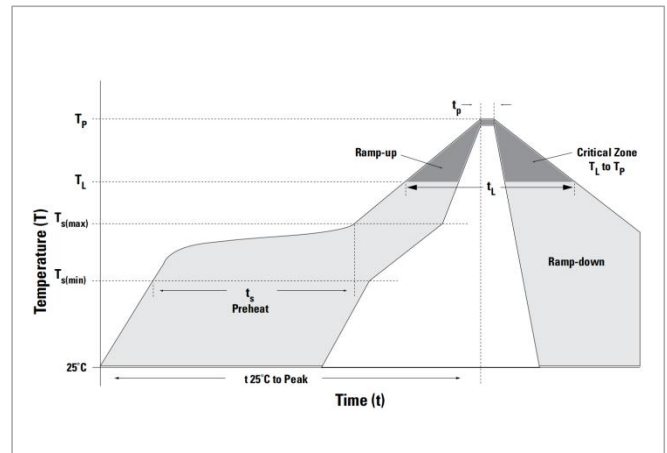


P6SMA Series

Surface Mount – 600W

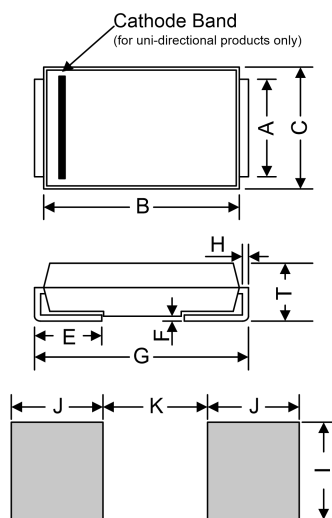
Soldering Parameters

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



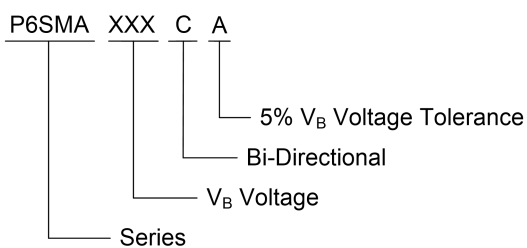
Dimensions

DO-214AC (SMA)

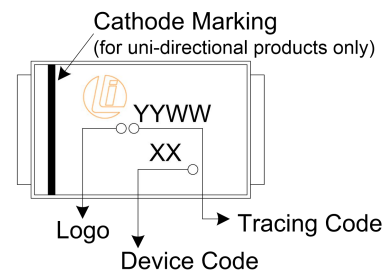


Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.250	1.650	0.049	0.065
B	3.990	4.600	0.157	0.181
C	2.400	2.790	0.095	0.110
E	0.780	1.520	0.030	0.060
F	-	0.203	-	0.008
G	4.800	5.280	0.189	0.208
H	0.152	0.305	0.006	0.012
T	1.900	2.290	0.075	0.090
I	1.800	-	0.070	-
J	2.100	-	0.082	-
K	-	2.300	-	0.090

Part Numbering System



Part Marking System



P6SMA Series

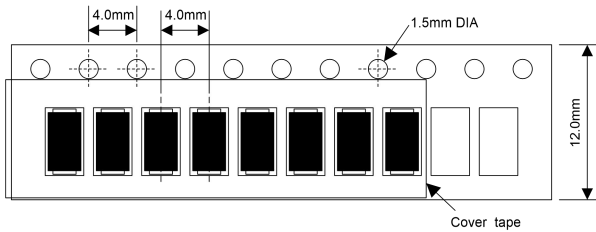
Surface Mount – 600W

Packaging

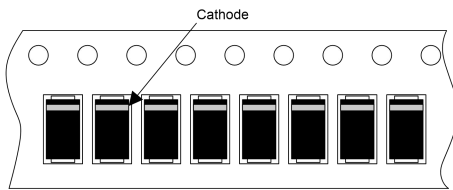
Part number	Component Package	Quantity	Packaging Option	Packaging Specification
P6SMAxxxXX	DO-214AC	5000	Tape & Reel - 12mm tape/13" reel	EIA STD RS-481

Tape and Reel Specification

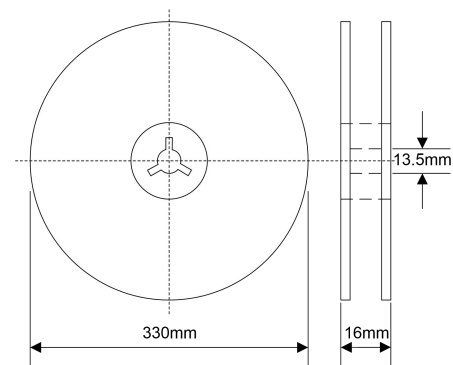
Tape



For Uni-Devices



13 Inches Reel



Quantity: 5000pcs/reel