P6SMA Series

Description

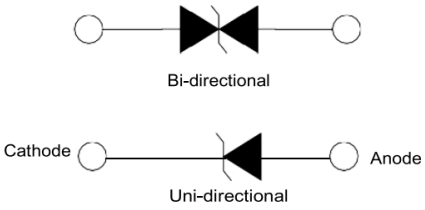
The P6SMA series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events. They have excellent clamping capability, high surge capability, low zener impedance and fast response time. The P6SMA series is supplied in YINT Semiconductor's exclusive, cost-effective, highly reliable and is ideally suited for use in communication systems, automotive, numerical controls, process controls, medical equipment, business machines, power supplies and many other industrial/consumer Applications.

Uni-directional Bi-directional

Features

- Case: DO-214AC(SMA)
- Excellent clamping capability
- 600 W peak pulse power capability with a 10/1000 μs waveform
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Fast response time: typically less than 1.0ps from 0 Volts to VB min.
- IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact).

Functional Diagram



Applications

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at TA=25ºC by 10/1000μs Waveform	P_{PK}	600	W
Power Dissipation on Infinite Heat Sink at T_L=50°C	P_D	3.3	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave[1]	I_{FSM}	60	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only[2]	V_F	3.5	V
Operating Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

NOTES:

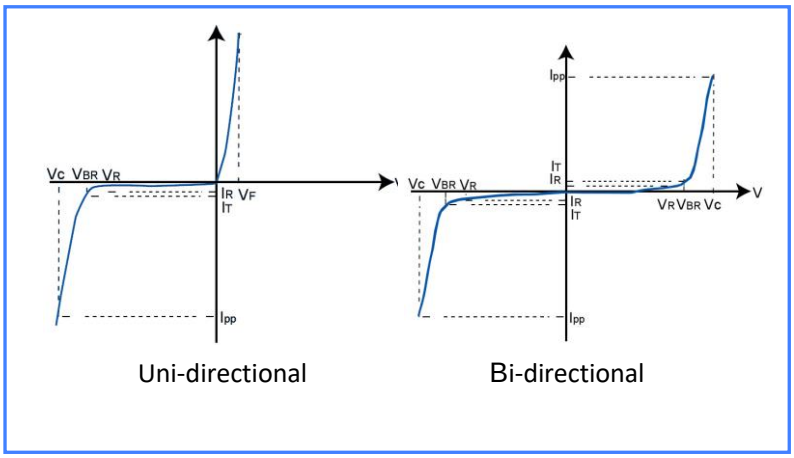
1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

Electrical characteristics (TA = 25 °C unless otherwise noted)

Part Number (Bi)	Part Number (Uni)	MARKING		Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts)@I_T		Test Current I_T(mA)	Maximum Reverse Leakage I_R @ V_R(μA)	Maximum Peak Pulse Current Ipp(A)	Maximum Clamping Voltage V_C @I_{PP}(V)
		BI	UNI		Min .V	Max .V				
P6SMA6.8CA	P6SMA6.8A	P6V8C	P6V8A	5.8	6.45	7.14	10	800	58.1	10.5
P6SMA7.5CA	P6SMA7.5A	P7V5C	P7V5A	6.4	7.13	7.88	10	500	54.0	11.3
P6SMA8.2CA	P6SMA8.2A	P8V2C	P8V2A	7.02	7.79	8.61	10	200	50.4	12.1
P6SMA9.1CA	P6SMA9.1A	P9V1C	P9V1A	7.78	8.65	9.55	10	50	45.5	13.4
P6SMA10CA	P6SMA10A	P10C	P10A	8.55	9.50	10.50	10	10	42.1	14.5
P6SMA11CA	P6SMA11A	P11C	P11A	9.40	10.50	11.60	1	5	39.1	15.6
P6SMA12CA	P6SMA12A	P12C	P12A	10.20	11.40	12.60	1	5	36.5	16.7
P6SMA13CA	P6SMA13 A	P13C	P13A	11.10	12.40	13.70	1	1	33.5	18.2
P6SMA15CA	P6SMA15A	P15C	P15A	12.80	14.30	15.80	1	1	28.8	21.2
P6SMA16CA	P6SMA16A	P16C	P16A	13.60	15.20	16.80	1	1	27.1	22.5
P6SMA18CA	P6SMA18A	P18C	P18A	15.30	17.10	18.90	1	1	24.2	25.2
P6SMA20CA	P6SMA20A	P20C	P20A	17.10	19.00	21.00	1	1	22.0	27.7
P6SMA22CA	P6SMA22A	P22C	P22A	18.80	20.90	23.10	1	1	19.9	30.6
P6SMA24CA	P6SMA24A	P24C	P24A	20.50	22.80	25.20	1	1	18.4	33.2
P6SMA27CA	P6SMA27A	P27C	P27A	23.10	25.70	28.40	1	1	16.3	37.5
P6SMA30CA	P6SMA30A	P30C	P30A	25.60	28.50	31.50	1	1	14.7	41.4
P6SMA33CA	P6SMA33A	P33C	P33A	28.20	31.40	34.70	1	1	13.3	45.7
P6SMA36CA	P6SMA36A	P36C	P36A	30.80	34.20	37.80	1	1	12.2	49.9
P6SMA39CA	P6SMA39A	P39C	P39A	33.30	37.10	41.00	1	1	11.3	53.9
P6SMA43CA	P6SMA43A	P43C	P43A	36.80	40.90	45.20	1	1	10.3	59.3
P6SMA47CA	P6SMA47A	P47C	P47A	40.20	44.70	49.40	1	1	9.4	64.8
P6SMA51CA	P6SMA51A	P51C	P51A	43.60	48.50	53.60	1	1	8.7	70.1
P6SMA56CA	P6SMA56A	P56C	P56A	47.80	53.20	58.80	1	1	7.9	77.0
P6SMA62CA	P6SMA62A	P62C	P62A	53.00	58.90	65.10	1	1	7.2	85.0
P6SMA68CA	P6SMA68A	P68C	P68A	58.10	64.60	71.40	1	1	6.6	92.0
P6SMA75CA	P6SMA75A	P75C	P75A	64.10	71.30	78.00	1	1	5.9	103.0
P6SMA82CA	P6SMA82A	P82C	P82A	70.10	77.90	86.10	1	1	5.4	113.0
P6SMA91CA	P6SMA91A	P91C	P91A	77.80	86.50	95.50	1	1	4.9	125.0
P6SMA100CA	P6SMA100A	P100C	P100A	85.50	95.0	105.0	1	1	4.5	137.0
P6SMA110CA	P6SMA110A	P110C	P110A	94.00	105.0	116.0	1	1	4.0	152.0
P6SMA120CA	P6SMA120A	P120C	P120A	102.0	114.0	126.0	1	1	3.7	165.0
P6SMA130CA	P6SMA130A	P130C	P130A	111.0	124.0	137.0	1	1	3.4	179.0
P6SMA150CA	P6SMA150A	P150C	P150A	128.0	143.0	158.0	1	1	2.9	207.0
P6SMA160CA	P6SMA160A	P160C	P160A	136.0	152.0	168.0	1	1	2.8	219.0
P6SMA170CA	P6SMA170A	P170C	P170A	145.0	162.0	179.0	1	1	2.6	234.0

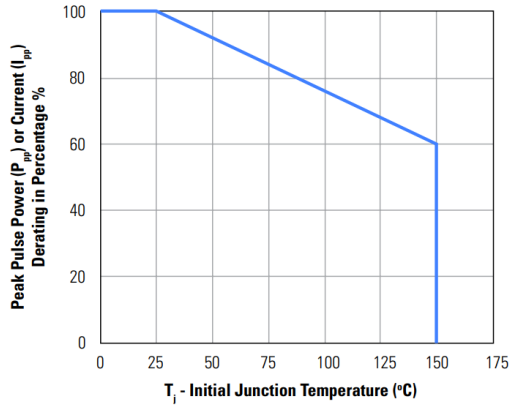
P6SMA180CA	P6SMA180A	P180C	P180A	154.0	171.0	189.00	1	1	2.5	246.0
P6SMA200CA	P6SMA200A	P200C	P200A	171.0	190.0	210.0	1	1	2.2	274.0
P6SMA220CA	P6SMA220A	P220C	P220A	185.0	209.0	231.0	1	1	1.9	328.0
P6SMA250CA	P6SMA250A	P250C	P250A	214.0	237.0	263.0	1	1	1.8	344.0
P6SMA300CA	P6SMA300A	P300C	P300A	256.0	285.0	315.0	1	1	1.5	414.0
P6SMA350CA	P6SMA350A	P350C	P350A	300.0	332.0	368.0	1	1	1.3	482.0
P6SMA400CA	P6SMA400A	P400C	P400A	342.0	380.0	420.0	1	1	1.1	548.0
P6SMA440CA	P6SMA440A	P440C	P440A	376.0	418.0	462.0	1	1	1.0	602.0
P6SMA480CA	P6SMA480A	P480C	P480A	408.0	456.0	504.0	1	1	0.9	658.0
P6SMA510CA	P6SMA510A	P510C	P510A	434.0	485.0	535.0	1	1	0.9	698.0
P6SMA540CA	P6SMA540A	P540C	P540A	460.0	513.0	567.0	1	1	0.8	740.0
P6SMA600CA	P6SMA600A	P600C	P600A	512.0	570.0	630.0	1	1	0.75	828.0

I-V Curve characteristics

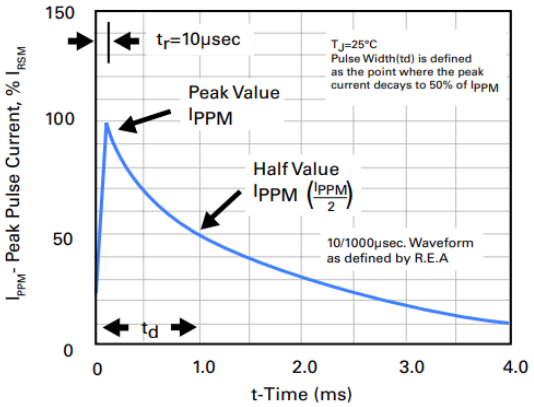


Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @V_{RWM}
V_{BR}	Breakdown Voltage @ I_T(Test Current)

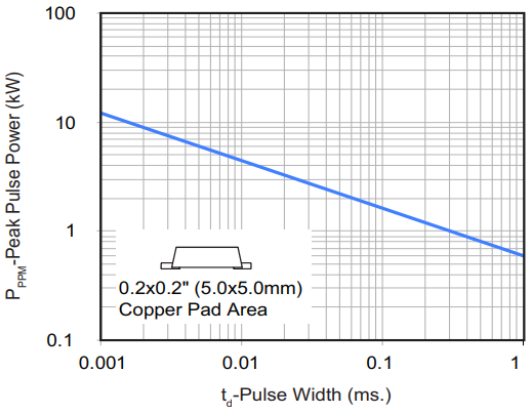
Rating & Characteristic Curves



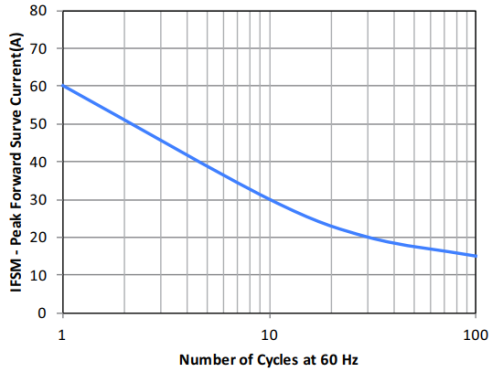
1.Peak pulse power derating curve



2. Pulse waveform

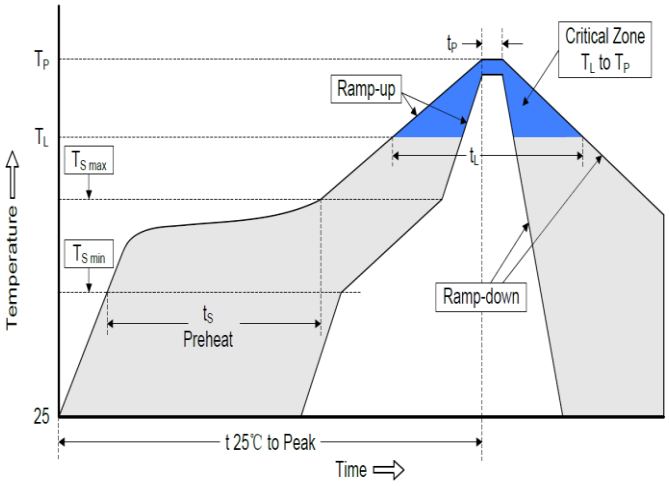


3. Peak pulse power rating curve



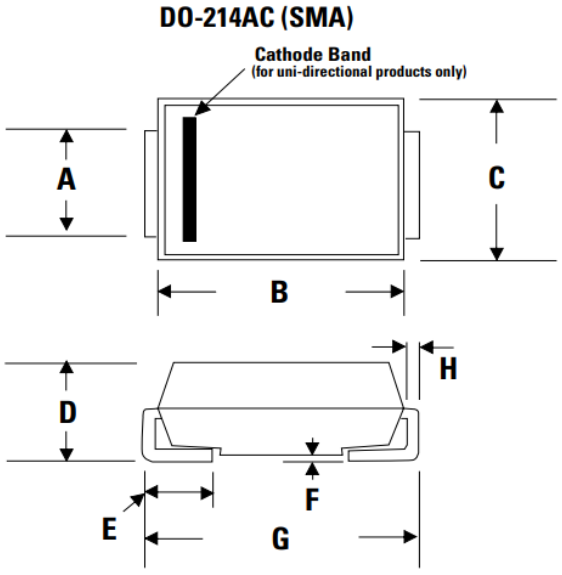
4. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

Soldering parameters



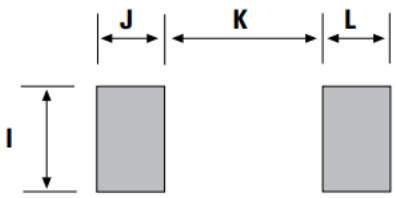
Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max)(t_S)	 150°C 200°C 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	 3°C/second max.
Time maintained above: - Temperature (T_L) - Time (t_L)	 217°C 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.

Package outline dimensions in millimeters

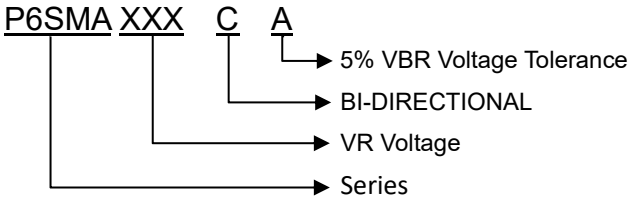


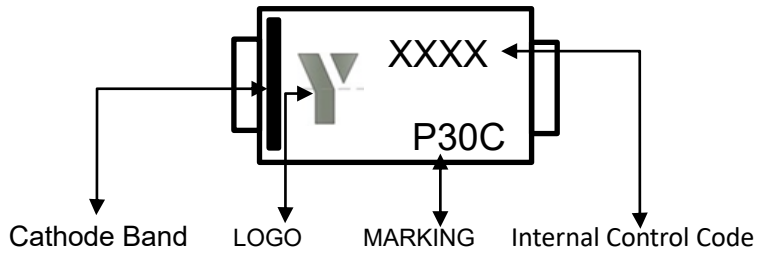
Dimensions	Millimeter	
	Min	Max
A	1.250	1.650
B	3.990	4.600
C	2.400	2.790
D	1.900	2.290
E	0.780	1.520
F	-	0.203
G	4.800	5.280
H	0.152	0.305
I	1.800	-
J	2.100	-
K	-	2.100
L	2.100	-

Mounting Pad Layout



Part number code & Marking code





(for Uni-directional products only)

Disclaimer

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.