

P4SMA Series

400W Surface Mount Transient Voltage Suppressors
VOLTAGE : 6.8 TO 550Volts

Features	Outline
<ul style="list-style-type: none"> • 400W peak pulse power capability with a 10/1000uS waveform, repetition rate (duty cycle): 0.01%. • Excellent clamping capability. • Low incremental surge resistance. • Suffix "G" indicates Halogen-free part, ex.P4SMA6.8(C)AG. • Glass passivated chip junction • Lead-free parts meet environmental standards of MIL-STD-19500 /228 	<p>SMA(DO-214AC)</p> <p>Dimensions in inches and (millimeters)</p>
Mechanical data	
<ul style="list-style-type: none"> • Epoxy:UL94-V0 rated flame retardant • Case : Molded plastic, DO-214AC / SMA • Terminals : Solder plated, solderable per MIL-STD-750, Method 2026 • Polarity : Indicated by cathode band • Weight : 0.002 ounce, 0.055 gram 	

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

Parameter	Conditions	Symbol	P4SMA Series	UNIT
Peak power dissipation	with a 10/1000 us waveform, Note 1 & Fig. 1	P_{PPM}	400	W
Peak pulse current	with a 10/1000 us waveform	I_{PPM}	See table 1	A
Steady state power dissipation	at $T_L=75^\circ\text{C}$ lead length 0.375" (9,5 mm), note 2	$P_{M(AV)}$	5.0	W
Peak forward surge current	8.3mS single half sine-wave superimposed on rated load (JEDEC method), note 3	I_{FSM}	40	A
Operating and Storage temperature		T_J, T_{STG}	-55 ~ +150	°C

Note 1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2

2. Mounted on copper pad area of 0.8" X 0.8" (40x40 mm) per Fig 5

3. Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum

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table 1

Part No.	Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Peak Forward Surge Current	Maximum Clamping Voltage @I _{PP}		Maximum Leakage Current	Marking Code	
	V _{RWM}	V _{BR Min}	V _{BR Max}	I _T	I _{FSM}	V _C	I _{PP}	I _R @V _{RWM}	UNI	BI
	Volts	Volts	Volts	mA	A	Volts	A	uA		
P4SMA6.8(C)A	5.80	6.45	7.14	10	40	10.5	39.0	1000	6V8A	6V8C
P4SMA7.5(C)A	6.40	7.13	7.88	10	40	11.3	36.3	500	7V5A	7V5C
P4SMA8.2(C)A	7.02	7.79	8.61	10	40	12.1	33.9	200	8V2A	8V2C
P4SMA9.1(C)A	7.78	8.65	9.55	1.0	40	13.4	30.6	50	9V1A	9V1C
P4SMA10(C)A	8.55	9.50	10.5	1.0	40	14.5	28.3	10	10A	10C
P4SMA11(C)A	9.4	10.5	11.6	1.0	40	15.6	26.3	5	11A	11C
P4SMA12(C)A	10.2	11.4	12.6	1.0	40	16.7	24.6	5	12A	12C
P4SMA13(C)A	11.1	12.4	13.7	1.0	40	18.2	22.5	1	13A	13C
P4SMA15(C)A	12.8	14.3	15.8	1.0	40	21.2	19.3	1	15A	15C
P4SMA16(C)A	13.6	15.2	16.8	1.0	40	22.5	18.2	1	16A	16C
P4SMA18(C)A	15.3	17.1	18.9	1.0	40	25.5	16.1	1	18A	18C
P4SMA20(C)A	17.1	19.0	21.0	1.0	40	27.7	14.8	1	20A	20C
P4SMA22(C)A	18.8	20.9	23.1	1.0	40	30.6	13.4	1	22A	22C
P4SMA24(C)A	20.5	22.8	25.2	1.0	40	33.2	12.3	1	24A	24C
P4SMA27(C)A	23.1	25.7	28.4	1.0	40	37.5	10.9	1	27A	27C
P4SMA30(C)A	25.6	28.5	31.5	1.0	40	41.4	9.9	1	30A	30C
P4SMA33(C)A	28.2	31.4	34.7	1.0	40	45.7	9.0	1	33A	33C
P4SMA36(C)A	30.8	34.2	37.8	1.0	40	49.9	8.2	1	36A	36C
P4SMA39(C)A	33.3	37.1	41.0	1.0	40	53.9	7.6	1	39A	39C
P4SMA43(C)A	36.8	40.9	45.2	1.0	40	59.3	6.9	1	43A	43C
P4SMA47(C)A	40.2	44.7	49.4	1.0	40	64.8	6.3	1	47A	47C
P4SMA51(C)A	43.6	48.5	53.6	1.0	40	70.1	5.8	1	51A	51C
P4SMA56(C)A	47.8	53.2	58.8	1.0	40	77.0	5.3	1	56A	56C
P4SMA62(C)A	53.0	58.9	65.1	1.0	40	85.0	4.8	1	62A	62C
P4SMA68(C)A	58.1	64.6	71.4	1.0	40	92.0	4.5	1	68A	68C
P4SMA75(C)A	64.1	71.3	78.8	1.0	40	103.0	4.0	1	75A	75C
P4SMA82(C)A	70.1	77.9	86.1	1.0	40	113.0	3.6	1	82A	82C
P4SMA91(C)A	77.8	86.5	95.5	1.0	40	125.0	3.3	1	91A	91C
P4SMA100(C)A	85.5	95.0	105.0	1.0	40	137.0	3.0	1	100A	100C
P4SMA110(C)A	94.0	105.0	116.0	1.0	40	152.0	2.7	1	110A	110C
P4SMA120(C)A	102.0	114.0	126.0	1.0	40	165.0	2.5	1	120A	120C
P4SMA130(C)A	111.0	124.0	137.0	1.0	40	179.0	2.3	1	130A	130C
P4SMA150(C)A	128.0	143.0	158.0	1.0	40	207.0	2.0	1	150A	150C
P4SMA160(C)A	136.0	152.0	168.0	1.0	40	219.0	1.9	1	160A	160C
P4SMA170(C)A	145.0	162.0	179.0	1.0	40	234.0	1.8	1	170A	170C



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Part No.	Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Peak Forward Surge Current	Maximum Clamping Voltage @ I_{PP}		Maximum Leakage Current	Marking Code	
	V_{RWM}	$V_{BR Min}$	$V_{BR Max}$	I_T	I_{FSM}	V_C	I_{PP}	$I_R @ V_{RWM}$		
	Volts	Volts	Volts	mA	A	Volts	A	uA	UNI	BI
P4SMA180(C)A	154.0	171.0	189.0	1.0	40	246.0	1.7	1	180A	180C
P4SMA200(C)A	171.0	190.0	210.0	1.0	40	274.0	1.5	1	200A	200C
P4SMA220(C)A	185.0	209.0	231.0	1.0	40	328.0	1.3	1	220A	220C
P4SMA250(C)A	214.0	237.0	263.0	1.0	40	344.0	1.2	1	250A	250C
P4SMA300(C)A	256.0	285.0	315.0	1.0	40	414.0	1.0	1	300A	300C
P4SMA350(C)A	300.0	332.0	368.0	1.0	40	482.0	0.9	1	350A	350C
P4SMA400(C)A	342.0	380.0	420.0	1.0	40	548.0	0.8	1	400A	400C
P4SMA440(C)A	376.0	418.0	462.0	1.0	40	602.0	0.7	1	440A	440C
P4SMA480(C)A	408.0	456.0	504.0	1.0	40	658.0	0.6	1	480A	480C
P4SMA510(C)A	434.0	485.0	535.0	1.0	40	698.0	0.6	1	510A	510C
P4SMA530(C)A	477.0	503.5	556.5	1.0	40	725.0	0.6	1	530A	530C
P4SMA540(C)A	486.0	513.0	567.0	1.0	40	740.0	0.5	1	540A	540C
P4SMA550(C)A	495.0	522.5	577.5	1.0	40	760.0	0.5	1	550A	550C

- Note 1. V_{BR} measured after I_T applied for 300uS, I_T =square wave pulse or equivalent
 2. Surge current waveform per Fig. 3 and derated per Fig. 2
 3. For bi-directional types having V_{RWM} of 10 volts and less, the I_T limit is doubled
 4. Suffix 'C' denotes bi-directional devices. Suffix 'A' denotes 5% tolerance devices, no suffix denotes 10% tolerance devices.
 5. All terms and symbols are consistent with ANS/IEEE C62.35
 6. Transient Voltage Suppressors (TVS) are devices used to protect vulnerable circuits from electrical overstress such as that caused by electrostatic discharge, inductive load switching and induced lightning. Within the TVS, damaging voltage spikes are limited by clamping or avalanche action of a rugged silicon pn junction which reduces the amplitude of the transient to a nondestructive level. See Fig. A & Fig. B

Fig. A - Transients of several thousand volts can be clamped to a safe level by the TVS

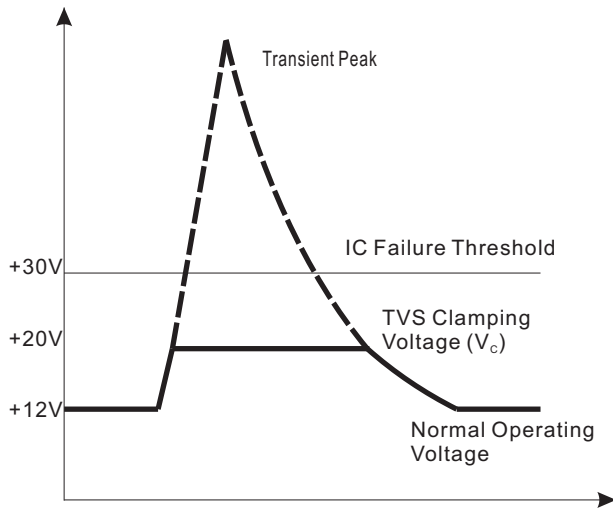
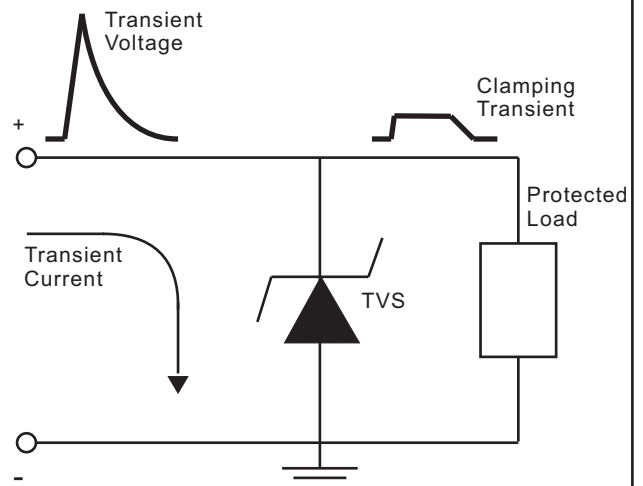


Fig. B - Transient current is diverted to ground thru TVS; the voltage seen by the protected load is limited to the clamping voltage level



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Fig.1 - Peak Pulse Power Rating Curve

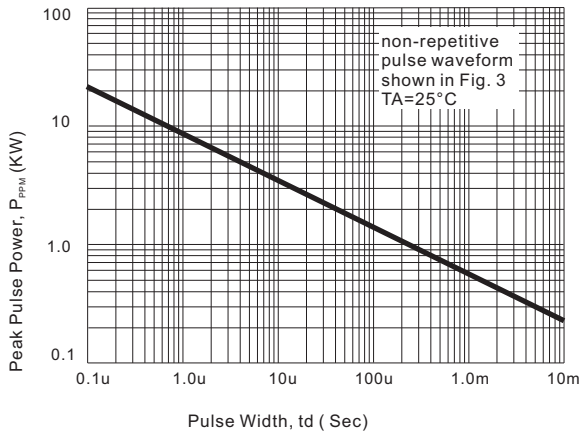


Fig.2 - Pulse Derating Curve

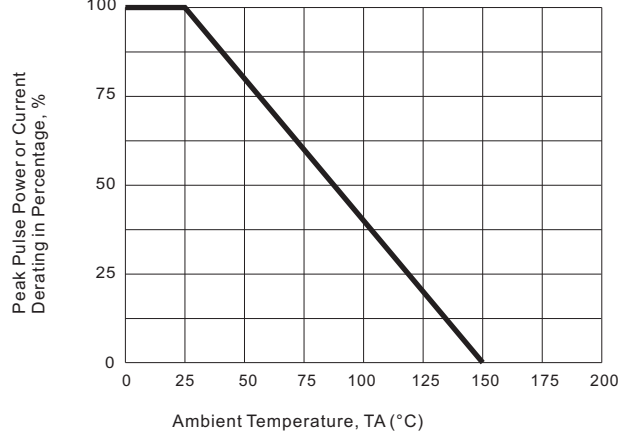


Fig.3 - Pulse Waveform

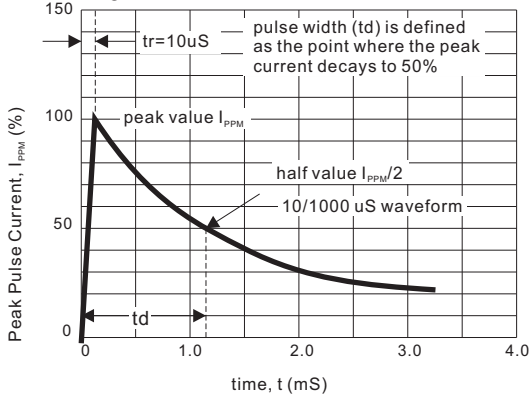


Fig.4 - Typical Junction Capacitance

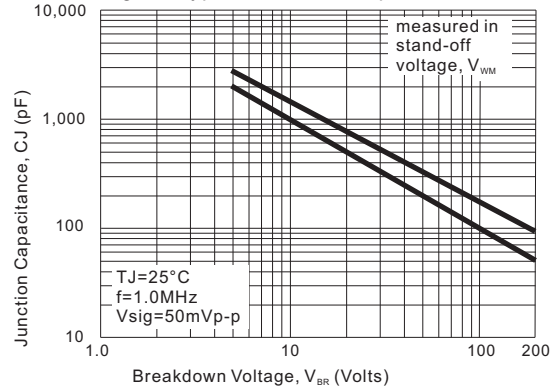


Fig.5 - Steady State Power Derating Curve

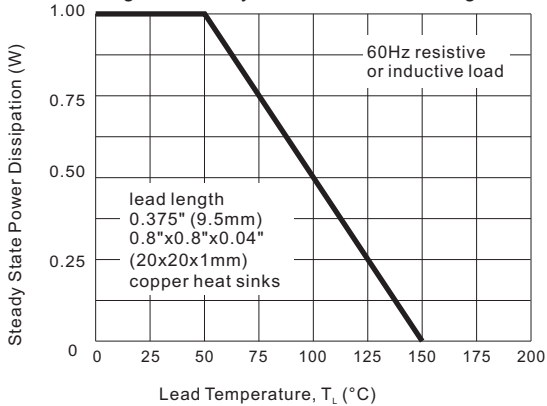


Fig.6 - Maximum Non-Repetitive Forward Surge Current

