

# P4SMA SERIES

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS



**REVERSE VOLTAGE:** 6.8 to 440 VOLTS

**PEAK PULSE POWER:** 400 WATTS

### FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- 400W peak pulse power capability on 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.01%
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time

### MECHANICAL DATA

Case: Molded plastic, DO-214AC(SMA)

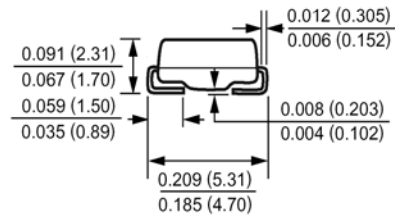
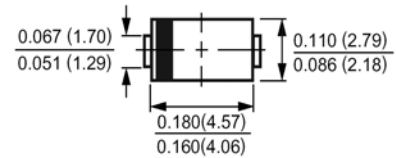
Terminals: Axial leads, solderable per MIL-STD-750, method 2026 guaranteed

Polarity: Color band denotes cathode except bipolar

Packaging: 12mm tape per EIA STD RS-481

Weight: 0.002 ounce, 0.064 gram

### DO-214AC(SMA)



Dimensions in inches and (millimeters)

### Maximum Ratings and Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Single phase, half wave, 60Hz, resistive or inductive load.

For capacitive load, derate current by 20%.

	Symbols	Limit	Units
Peak power dissipation with a 10/1000 $\mu$ s waveform (Note 1, 2) (Fig. 1)	$P_{PPM}$	Minimum 400	Watts
Peak pulse current with a 10/1000 $\mu$ s waveform (Note 1) (Fig. 3)	$I_{PPM}$	See Next Table	Amp
Power dissipation on infinite heatsink, $T_A = 50^\circ\text{C}$	$P_{M(AV)}$	1.0	Watts
Peak forward surge current, 8.3ms single half sine-wave unidirectional only (Note 2)	$I_{FSM}$	40	Amp
Maximum instantaneous forward voltage at 25A for unidirectional only (Note 4)	$V_F$	3.5/6.5	Volts
Thermal resistance junction to leads	$R_{\theta JL}$	30	$^\circ\text{C/W}$
Thermal resistance junction to ambient air (Note 3)	$R_{\theta JA}$	120	$^\circ\text{C/W}$
Operating junction and storage temperature range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

### NOTES:

- 1- Non-repetitive current pulse, per Fig. 3 and derated above  $T_A = 25^\circ\text{C}$  per Fig. 2. Rating is 300W above 91V.
- 2- Mounted on 0.2 x 0.2" (5.0 x 5.0mm) copper pads to each terminal
- 3- Mounted on minimum recommended pad layout
- 4-  $V_F = 3.5\text{V}$  for P4SMA200(A) & below;  $V_F = 6.5\text{V}$  for P4SMA220(A) & above

### Devices for Bidirectional Applications:

- 1- For bi-directional, use C or CA suffix for types P4SMA6.8 thru types P4SMA440A (e.g. P4SMA6.8C, P4SMA440CA).
- 2- Electrical characteristics apply in both directions.

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Single phase, half wave, 60Hz, resistive or inductive load.

For capacitive load, derate current by 20%.

Device Type	Breakdown Voltage		Test Current	Reverse Stand off Voltage	Maximum Reverse Leakage at $V_{WM}$	Maximum Peak Pulse Current	Maximum Clamping Voltage at $I_{PPM}$	Maximum Temperature Coefficient of $V_{BR}$
	$V_{BR}$ at $I_T$ (Note 1)		$I_T$	$V_{WM}$	$I_D$ (Note 3)	$I_{PPM}$ (Note 2)	$V_C$	/
	Volts (min.)	Volts (max.)	mAmps	Volts	uAmps	Amps	Volts	% / °C
P4SMA6.8	6.12	7.48	10	5.50	1000	37.0	10.8	0.057
P4SMA6.8A	6.45	7.14	10	5.80	1000	38.1	10.5	0.057
P4SMA7.5	6.75	8.25	10	6.05	500	34.2	11.7	0.061
P4SMA7.5A	7.13	7.88	10	6.40	500	35.4	11.3	0.061
P4SMA8.2	7.38	9.02	10	6.63	200	32.0	12.5	0.065
P4SMA8.2A	7.79	8.61	10	7.02	200	33.1	12.1	0.065
P4SMA9.1	8.19	10.0	1.0	7.37	50	29.0	13.8	0.068
P4SMA9.1A	8.65	9.55	1.0	7.78	50	29.9	13.4	0.068
P4SMA10	9.00	11.0	1.0	8.10	10	26.7	15.0	0.073
P4SMA10A	9.50	10.5	1.0	8.55	10	27.6	14.5	0.073
P4SMA11	9.90	12.1	1.0	8.92	5.0	24.7	16.2	0.075
P4SMA11A	10.5	11.6	1.0	9.40	5.0	25.6	15.6	0.075
P4SMA12	10.8	13.2	1.0	9.72	5.0	23.1	17.3	0.078
P4SMA12A	11.4	12.6	1.0	10.2	5.0	24.0	16.7	0.078
P4SMA13	11.7	14.3	1.0	10.5	5.0	21.1	19.0	0.081
P4SMA13A	12.4	13.7	1.0	11.1	5.0	22.0	18.2	0.081
P4SMA15	13.5	16.5	1.0	12.1	5.0	18.2	22.0	0.084
P4SMA15A	14.3	15.8	1.0	12.8	5.0	18.9	21.2	0.084
P4SMA16	14.4	17.6	1.0	12.9	5.0	17.0	23.5	0.086
P4SMA16A	15.2	16.8	1.0	13.6	5.0	17.8	22.5	0.086
P4SMA18	16.2	19.8	1.0	14.5	5.0	15.1	26.5	0.088
P4SMA18A	17.1	18.9	1.0	15.3	5.0	15.9	25.2	0.088
P4SMA20	18.0	22.0	1.0	16.2	5.0	13.7	29.1	0.090
P4SMA20A	19.0	21.0	1.0	17.1	5.0	14.4	27.7	0.090
P4SMA22	19.8	24.2	1.0	17.8	5.0	12.5	31.9	0.092
P4SMA22A	20.9	23.1	1.0	18.8	5.0	13.1	30.6	0.092
P4SMA24	21.6	26.4	1.0	19.4	5.0	11.5	34.7	0.094
P4SMA24A	22.8	25.2	1.0	20.5	5.0	12.0	33.2	0.094
P4SMA27	24.3	29.7	1.0	21.8	5.0	10.2	39.1	0.096
P4SMA27A	25.7	28.4	1.0	23.1	5.0	10.7	37.5	0.096
P4SMA30	27.0	33.0	1.0	24.3	5.0	9.2	43.5	0.097
P4SMA30A	28.5	31.5	1.0	25.6	5.0	9.7	41.4	0.097
P4SMA33	29.7	36.3	1.0	26.8	5.0	8.4	47.7	0.098
P4SMA33A	31.4	34.7	1.0	28.2	5.0	8.8	45.7	0.098
P4SMA36	32.4	39.6	1.0	29.1	5.0	7.7	52.0	0.099
P4SMA36A	34.2	37.8	1.0	30.8	5.0	8.0	49.9	0.099
P4SMA39	35.1	42.9	1.0	31.6	5.0	7.1	56.4	0.100
P4SMA39A	37.1	41.0	1.0	33.3	5.0	7.4	53.9	0.100
P4SMA43	38.7	47.3	1.0	34.8	5.0	6.5	61.9	0.101
P4SMA43A	40.9	45.2	1.0	36.8	5.0	6.7	59.3	0.101
P4SMA47	42.3	51.7	1.0	38.1	5.0	5.9	67.8	0.101
P4SMA47A	44.7	49.4	1.0	40.2	5.0	6.2	64.8	0.101
P4SMA51	45.9	56.1	1.0	41.3	5.0	5.4	73.5	0.102
P4SMA51A	48.5	53.6	1.0	43.6	5.0	5.7	70.1	0.102
P4SMA56	50.4	61.6	1.0	45.4	5.0	5.0	80.5	0.103
P4SMA56A	53.2	58.8	1.0	47.8	5.0	5.2	77.0	0.103

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Device Type	Breakdown Voltage		Test Current	Reverse Stand off Voltage	Maximum Reverse Leakage at $V_{WM}$	Maximum Peak Pulse Current	Maximum Clamping Voltage at $I_{PPM}$	Maximum Temperature Coefficient of $V_{BR}$
	$V_{BR}$ at $I_T$ ( Note 1 )		$I_T$	$V_{WM}$	$I_D$ ( Note 3 )	$I_{PPM}$ ( Note 2 )	$V_C$	/
	Volts (min.)	Volts (max.)	mAmps	Volts	uAmps	Amps	Volts	% / °C
P4SMA62	55.8	68.2	1.0	50.2	5.0	4.5	89.0	0.104
P4SMA62A	58.9	65.1	1.0	53.0	5.0	4.7	85.0	0.104
P4SMA68	61.2	74.8	1.0	55.1	5.0	4.1	98.0	0.104
P4SMA68A	64.6	71.4	1.0	58.1	5.0	4.3	92.0	0.104
P4SMA75	67.5	82.5	1.0	60.7	5.0	3.7	108	0.105
P4SMA75A	71.3	78.8	1.0	64.1	5.0	3.9	103	0.105
P4SMA82	73.8	90.2	1.0	66.4	5.0	3.4	118	0.105
P4SMA82A	77.9	86.1	1.0	70.1	5.0	3.5	113	0.105
P4SMA91	81.9	100	1.0	73.7	5.0	3.1	131	0.106
P4SMA91A	86.5	95.5	1.0	77.8	5.0	3.2	125	0.106
P4SMA100	90.0	110	1.0	81.0	5.0	2.8	144	0.106
P4SMA100A	95.0	105	1.0	85.5	5.0	2.9	137	0.106
P4SMA110	99.0	121	1.0	89.2	5.0	2.5	158	0.107
P4SMA110A	105	116	1.0	94.0	5.0	2.6	152	0.107
P4SMA120	108	132	1.0	97.2	5.0	2.3	173	0.107
P4SMA120A	114	126	1.0	102	5.0	2.4	165	0.107
P4SMA130	117	143	1.0	105	5.0	2.1	187	0.107
P4SMA130A	124	137	1.0	111	5.0	2.2	179	0.107
P4SMA150	135	165	1.0	121	5.0	1.9	215	0.108
P4SMA150A	143	158	1.0	128	5.0	1.9	207	0.108
P4SMA160	144	176	1.0	130	5.0	1.7	230	0.108
P4SMA160A	152	168	1.0	136	5.0	1.8	219	0.108
P4SMA170	153	187	1.0	138	5.0	1.6	244	0.108
P4SMA170A	162	179	1.0	145	5.0	1.7	234	0.108
P4SMA180	162	198	1.0	146	5.0	1.6	258	0.108
P4SMA180A	171	189	1.0	154	5.0	1.6	246	0.108
P4SMA200	180	220	1.0	162	5.0	1.4	287	0.108
P4SMA200A	190	210	1.0	171	5.0	1.5	274	0.108
P4SMA220	198	242	1.0	175	5.0	1.2	344	0.108
P4SMA220A	209	231	1.0	185	5.0	1.2	328	0.108
P4SMA250	225	275	1.0	202	5.0	1.1	360	0.110
P4SMA250A	237	263	1.0	214	5.0	1.2	344	0.110
P4SMA300	270	330	1.0	243	5.0	0.93	430	0.110
P4SMA300A	285	315	1.0	256	5.0	1.00	414	0.110
P4SMA350	315	385	1.0	284	5.0	0.79	504	0.110
P4SMA350A	332	368	1.0	300	5.0	0.83	482	0.110
P4SMA400	360	440	1.0	324	5.0	0.70	574	0.110
P4SMA400A	380	420	1.0	342	5.0	0.73	548	0.110
P4SMA440	396	484	1.0	356	5.0	0.63	631	0.110
P4SMA440A	418	462	1.0	376	5.0	0.66	602	0.110

#### NOTES:

1- Pulse test:  $t_p \leq 50ms$

2- Surge current waveform per Fig. 3 and derate per Fig. 2

3- For bidirectional types having  $V_{WM}$  of 10 volts and less, the  $I_D$  limit is doubled

4- All terms and symbols are consistent with ANSI/IEEE C62.35

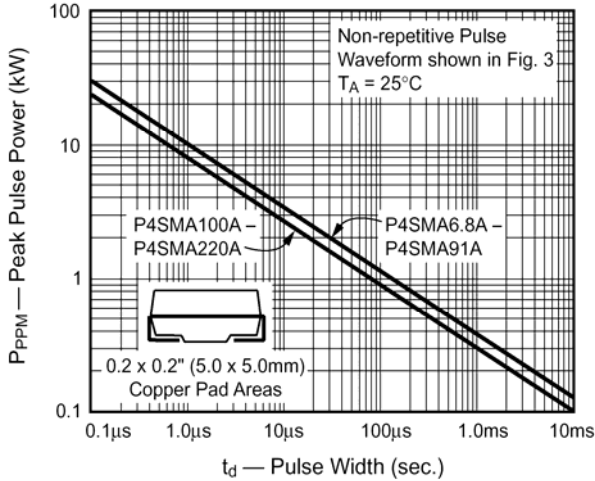
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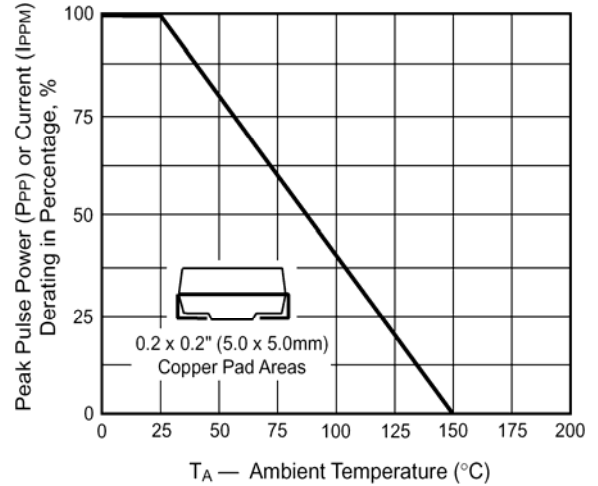


### RATINGS AND CHARACTERISTIC CURVES

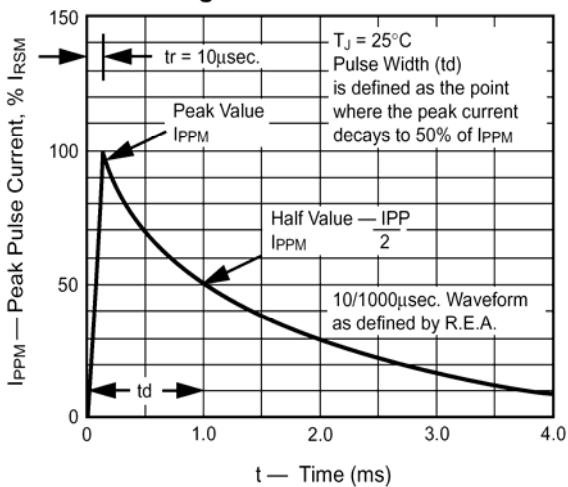
**Fig. 1 – Peak Pulse Power Rating Curve**



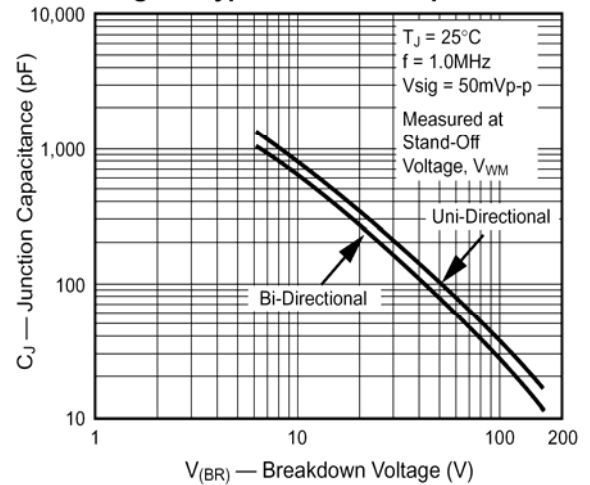
**Fig. 2 – Pulse Derating Curve**



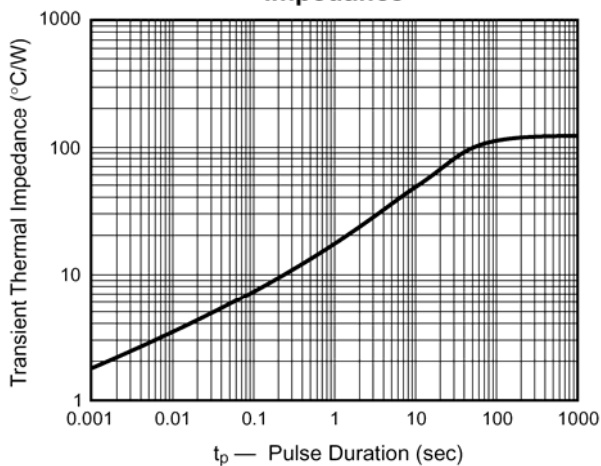
**Fig. 3 – Pulse Waveform**



**Fig. 4 – Typical Junction Capacitance**



**Fig. 5 – Typical Transient Thermal Impedance**



**Fig. 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only**

