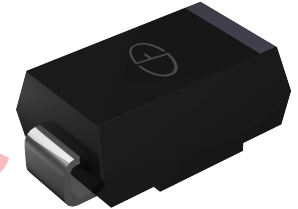


# 3.0SMCJ7.0 thru 3.0SMCJ170CA

Transient Voltage Suppressors  
 Peak Pulse Power 3000W Stand-off Voltage 7V to 170V

## Features

- 3000 W peak pulse power capability with a 10/1000  $\mu$ s waveform
- Excellent clamping capability
- Fast response time
- Low incremental surge resistance
- Meets MSL level 1, per J-STD-020, LF maximum Solder dip 275°C, 10s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



DO-214AB(SMC)



## Applications

For use in sensitive electronics protection against voltage transients induced by lightning or inductive load switching. Key applications include protection of I/O interfaces, industrial and LED lighting applications, DC power buses, and other vulnerable circuits used in consumer electronics.

For bi-directional devices, use suffix C or CA (e.g.3.0SMCJ7.0CA). Electrical characteristics apply in both directions.

## Mechanical Data

**Case:** DO-214AB (SMC)

Molding compound meets UL 94 V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

**Marking:** Laser marking band denotes cathode end or device code; Unidirectional-Device Code and Cathode Band; Bidirectional-Device Code Only

## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform (1) (Fig. 3)	P <sub>PPM</sub>	3000	W
Peak power pulse current with a 10/1000 $\mu$ s waveform (1) (Fig. 1)	I <sub>PPM</sub>	See Next Table	A
Peak forward surge current 8.3 ms single half sine-wave (2)	I <sub>FSM</sub>	250	A
Power dissipation on infinite heatsink at T <sub>L</sub> = 75 °C (Fig. 6)	P <sub>D</sub>	6.0	W
Maximum instantaneous forward voltage at 100A (2)	V <sub>F</sub>	3.5	V
Typical Thermal Resistance junction to case	R <sub>θJC</sub>	49	°C/W
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	- 65 to + 175	°C

## Notes:

(1) Non-repetitive current pulse, per Fig. 3 and derated above T<sub>A</sub> = 25 °C per Fig. 2

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

# 3.0SMCJ7.0 thru 3.0SMCJ170CA

Transient Voltage Suppressors

Peak Pulse Power 3000W Stand-off Voltage 7V to 170V

## Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise specified)

For bi-directional devices, use suffix CA (e.g. 3.0SMCJ7.0CA). Electrical characteristics apply in both directions

Device Type	Marking Code		Breakdown Voltage $V_{(BR)}$ (Volts) <sup>(1)</sup>		Test Current at $I_T$ (mA)	Stand-off Voltage $V_{WM}$ (V)	Maximum Reverse Leakage at $V_{WM}$ $I_R$ ( $\mu\text{A}$ )		Maximum Peak Pulse surge current $I_{PP}$ <sup>(2)</sup> (A) <sub>M</sub>	Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (Volts)
	UNI	BI	Min.	Max.			UNI	BI		
3.0SMCJ7.0	HDL	IDL	7.78	9.36	10	7	200	400	225.6	13.3
3.0SMCJ7.0A	HDM	IDM	7.78	8.45	10	7	200	400	250	12
3.0SMCJ7.5	HDN	IDN	8.33	10.17	1	7.5	100	200	209.8	14.3
3.0SMCJ7.5A	HDP	IDP	8.33	9.08	1	7.5	100	200	232.6	12.9
3.0SMCJ8.0	HDQ	IDQ	8.89	10.8	1	8	50	100	220	13.7
3.0SMCJ8.0A	HDR	IDR	8.89	9.73	1	8	50	100	220.6	13.6
3.0SMCJ8.5	HDS	IDS	9.44	11.42	1	8.5	25	50	188.8	15.9
3.0SMCJ8.5A	HDT	IDT	9.44	10.32	1	8.5	25	50	208.4	14.4
3.0SMCJ9.0	HDU	IDU	10	12.1	1	9	10	20	177.4	16.9
3.0SMCJ9.0A	HDV	IDV	10	11	1	9	10	20	194.8	15.4
3.0SMCJ10	HDW	IDW	11.1	13.6	1	10	5	5	159.6	18.8
3.0SMCJ10A	HDX	IDX	11.1	12.3	1	10	5	5	176.4	17
3.0SMCJ11	HDY	IDY	12.2	14.9	1	11	5	5	149.2	20.1
3.0SMCJ11A	HDZ	IDZ	12.2	13.5	1	11	5	5	184.88	16.3
3.0SMCJ12	HED	IED	13.3	16.4	1	12	5	5	136.4	22
3.0SMCJ12A	HEE	IEE	13.3	14.8	1	12	5	5	150.6	20
3.0SMCJ13	HEF	IEF	14.4	17.7	1	13	5	5	126	24
3.0SMCJ13A	HEG	IEG	14.4	16	1	13	5	5	139.4	21.6
3.0SMCJ14	HEH	IEH	15.6	19.3	1	14	5	5	116.2	25.9
3.0SMCJ14A	HEK	IEK	15.6	17.4	1	14	5	5	129.4	23.2
3.0SMCJ15	HEL	IEL	16.7	20.6	1	15	5	5	111.6	26.9
3.0SMCJ15A	HEM	IEM	16.7	18.7	1	15	5	5	123	24.4
3.0SMCJ16	HEN	IEN	17.8	22.1	1	16	5	5	104.2	28.8
3.0SMCJ16A	HEP	IEP	17.8	20	1	16	5	5	115.4	26
3.0SMCJ17	HEQ	IEQ	18.9	23.4	1	17	5	5	98.4	30.5
3.0SMCJ17A	HER	IER	18.9	21.2	1	17	5	5	106.6	28.2
3.0SMCJ18	HES	IES	20	24.8	1	18	5	5	93.2	32.2
3.0SMCJ18A	HET	IET	20	22.8	1	18	5	5	102.8	29.2
3.0SMCJ20	HEU	IEU	22.2	27.6	1	20	5	5	83.8	35.8
3.0SMCJ20A	HEV	IEV	22.2	25	1	20	5	5	92.6	32.4

# 3.0SMCJ7.0 thru 3.0SMCJ170CA

Transient Voltage Suppressors  
 Peak Pulse Power 3000W Stand-off Voltage 7V to 170V

## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise specified)

Device Type	Marking Code		Breakdown Voltage V <sub>(BR)</sub> (Volts) <sup>(1)</sup>		Test Current at I <sub>T</sub> (mA)	Stand-off Voltage V <sub>WM</sub> (V)	Maximum Reverse Leakage at V <sub>WM</sub> I <sub>R</sub> (uA)		Maximum Peak Pulse surge current I <sub>PP</sub> <sup>(2)</sup> (A) <sub>M</sub>	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>C</sub> (Volts)
	UNI	BI	Min.	Max.			UNI	BI		
3.0SMCJ22	HEW	IEW	24.4	30.4	1	22	5	5	76.2	39.4
3.0SMCJ22A	HEX	IEX	24.4	27.5	1	22	5	5	84.4	35.7
3.0SMCJ24	HEY	IEY	26.7	33.3	1	24	5	5	69.8	43
3.0SMCJ24A	HEZ	IEZ	26.7	30.2	1	24	5	5	77.2	38.9
3.0SMCJ26	HFD	IFD	28.9	36.1	1	26	5	5	64.4	46.6
3.0SMCJ26A	HFE	IFE	28.9	32.7	1	26	5	5	71.2	42.3
3.0SMCJ28	HFF	IFF	31.1	38.9	1	28	5	5	60	50
3.0SMCJ28A	HFG	IFG	31.1	35.3	1	28	5	5	66	45.6
3.0SMCJ30	HFH	IFH	33.3	41.7	1	30	5	5	56	53.6
3.0SMCJ30A	HFK	IFK	33.3	37.8	1	30	5	5	62	48.4
3.0SMCJ33	HFL	IFL	36.7	46	1	33	5	5	50.4	59.8
3.0SMCJ33A	HFM	IFM	36.7	41.7	1	33	5	5	56.2	53.7
3.0SMCJ36	HFN	IFN	40	50.2	1	36	5	5	46.6	64.6
3.0SMCJ36A	HFP	IFP	40	45.5	1	36	5	5	51.6	58.2
3.0SMCJ40	HFQ	IFQ	44.4	55.8	1	40	5	5	42	71.5
3.0SMCJ40A	HFR	IFR	44.4	50.6	1	40	5	5	46.4	64.7
3.0SMCJ43	HFS	IFS	47.8	60	1	43	5	5	39.2	76.7
3.0SMCJ43A	HFT	IFT	47.8	54.4	1	43	5	5	43.2	69.5
3.0SMCJ45	HFU	IFU	50	62.8	1	45	5	5	37.4	80.3
3.0SMCJ45A	HFV	IFV	50	57	1	45	5	5	41.2	72.9
3.0SMCJ48	HFV	IFV	53.3	67	1	48	5	5	35	85.8
3.0SMCJ48A	HFX	IFX	53.3	60.8	1	48	5	5	38.8	77.4
3.0SMCJ51	HFY	IFY	56.7	71.3	1	51	5	5	37	81.5
3.0SMCJ51A	HFZ	IFZ	56.7	64.7	1	51	5	5	36.4	82.5
3.0SMCJ54	HGD	IGD	60	75.5	1	54	5	5	31.2	96.3
3.0SMCJ54A	HGE	IGE	60	68.5	1	54	5	5	34.4	87.5
3.0SMCJ58	HGF	IGF	64.4	81.1	1	58	5	5	29.2	103
3.0SMCJ58A	HGG	IGG	64.4	73.6	1	58	5	5	32	94
3.0SMCJ60	HGH	IGH	66.7	84	1	60	5	5	28	107.5
3.0SMCJ60A	HGK	IGK	66.7	76.2	1	60	5	5	31	97

# 3.0SMCJ7.0 thru 3.0SMCJ170CA

Transient Voltage Suppressors  
 Peak Pulse Power 3000W Stand-off Voltage 7V to 170V

## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise specified)

Device Type	Marking Code		Breakdown Voltage V <sub>(BR)</sub> (Volts) <sup>(1)</sup>		Test Current at I <sub>T</sub> (mA)	Stand-off Voltage V <sub>WM</sub> (V)	Maximum Reverse Leakage at V <sub>WM</sub> I <sub>R</sub> (uA)		Maximum Peak Pulse surge current I <sub>PP</sub> <sup>(2)</sup> (A) <sub>M</sub>	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>C</sub> (Volts)
	UNI	BI	Min.	Max.			UNI	BI		
3.0SMCJ64	HGL	IGL	71.1	89.6	1	64	5	5	26.4	114
3.0SMCJ64A	HGM	IGM	71.1	81.3	1	64	5	5	29.2	103
3.0SMCJ70	HGN	IGN	77.8	98.1	1	70	5	5	24	125
3.0SMCJ70A	HGP	IGP	77.8	89	1	70	5	5	26.8	112.1
3.0SMCJ75	HGQ	IGQ	83.3	105.2	1	75	5	5	22.4	134
3.0SMCJ75A	HGR	IGR	83.3	95.3	1	75	5	5	24.8	121
3.0SMCJ78	HGS	IGS	86.7	109.3	1	78	5	5	21.6	139
3.0SMCJ78A	HGT	IGT	86.7	99.2	1	78	5	5	22.8	132
3.0SMCJ85	HGU	IGU	94.4	118.7	1	85	5	5	19.8	152
3.0SMCJ85A	HGV	IGV	94.4	107.7	1	85	5	5	20.8	145
3.0SMCJ90	HGW	IGW	100	126	1	90	5	5	18.8	160
3.0SMCJ90A	HGX	IGX	100	115	1	90	5	5	20.6	146
3.0SMCJ100	HGY	IGY	111	140.5	1	100	5	5	16.6	181
3.0SMCJ100A	HGZ	IGZ	111	127.5	1	100	5	5	18.6	162
3.0SMCJ110	HHD	IHD	122	154	1	110	5	5	15.4	196
3.0SMCJ110A	HHE	IHE	122	140	1	110	5	5	16.8	179
3.0SMCJ120	HHF	IHF	133	168.5	1	120	5	5	14	215
3.0SMCJ120A	HHG	IHG	133	152.5	1	120	5	5	15.6	193
3.0SMCJ130	HHH	IHH	144	182	1	130	5	5	13	231
3.0SMCJ130A	HHK	IHK	144	165	1	130	5	5	14.4	209
3.0SMCJ150	HHL	IHL	167	211	1	150	5	5	11.2	268
3.0SMCJ150A	HHM	IHM	167	192	1	150	5	5	12.4	243
3.0SMCJ160	HHN	IHN	178	225.5	1	160	5	5	10.4	289
3.0SMCJ160A	HHP	IHP	178	204.5	1	160	5	5	11.6	259
3.0SMCJ170	HHQ	IHQ	189	239	1	170	5	5	9.8	307
3.0SMCJ170A	HHR	IHR	189	217	1	170	5	5	11	273

### Notes:

- (1) Pulse test: tp ≤ 50 ms
- (2) Surge current waveform per Fig. 3 and derated per Fig. 2
- (3) All terms and symbols are consistent with ANSI/IEEE C62.35

# 3.0SMCJ7.0 thru 3.0SMCJ170CA

Transient Voltage Suppressors

Peak Pulse Power 3000W Stand-off Voltage 7V to 170V

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

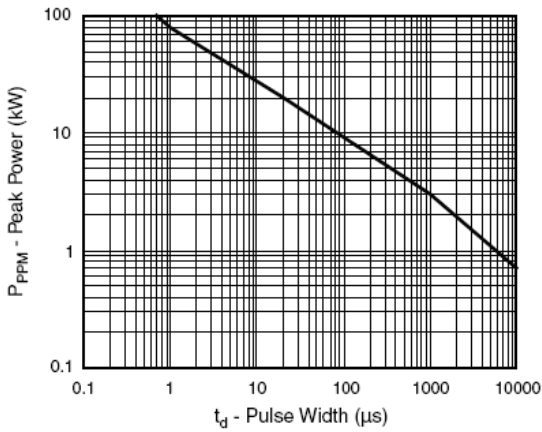


FIGURE 1-PEAK PULSE POWER VS PULSE TIME

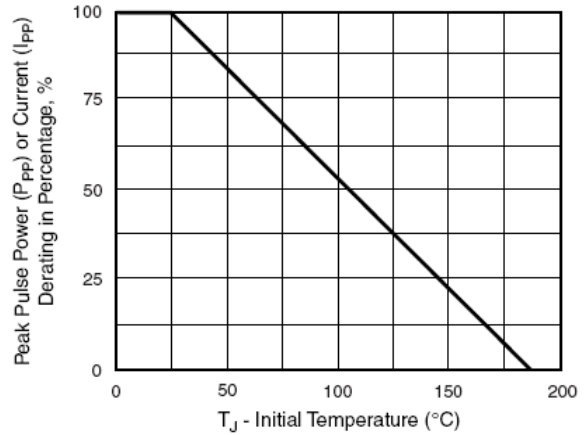


FIGURE 2 Pulse Power or Current vs. Initial Junction Temperature

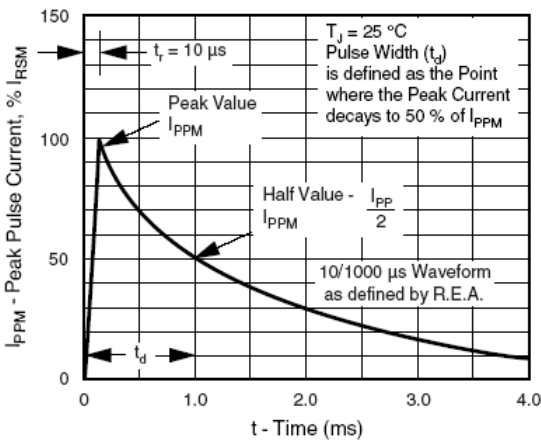


FIGURE 3-PULSE WAVEFORM

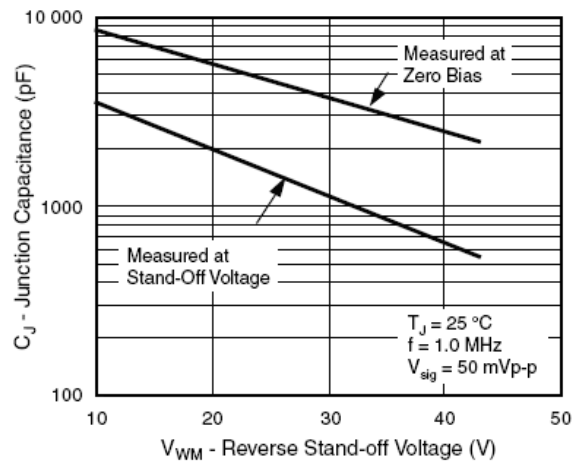


FIGURE 4 TYPICAL CAPACITANCE VS STAND-OFF VOLTAGE

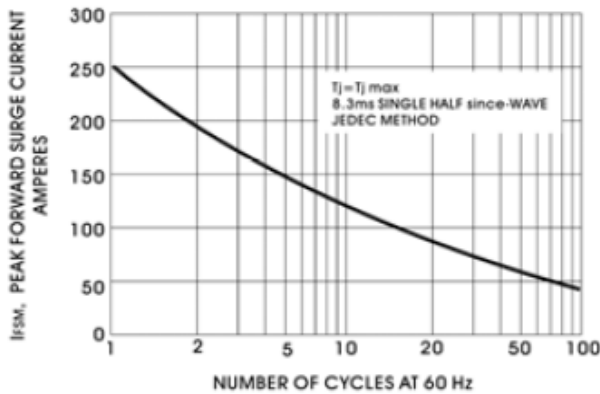


FIGURE 5 MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT UNIDIRECTIONAL

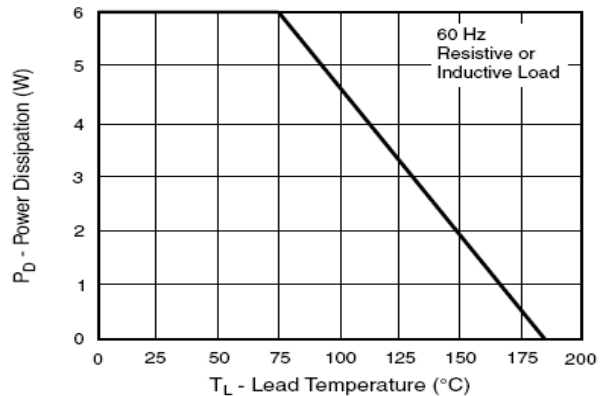


FIGURE 6 STEADY STATE POWER DERATING CURVE

# 3.0SMCJ7.0 thru 3.0SMCJ170CA

Transient Voltage Suppressors  
 Peak Pulse Power 3000W Stand-off Voltage 7V to 170V

## Package Outline Dimensions

DO-214AB(SMC) dimensions in inches (millimeters)

