SMCJ5.0 thru 440CA

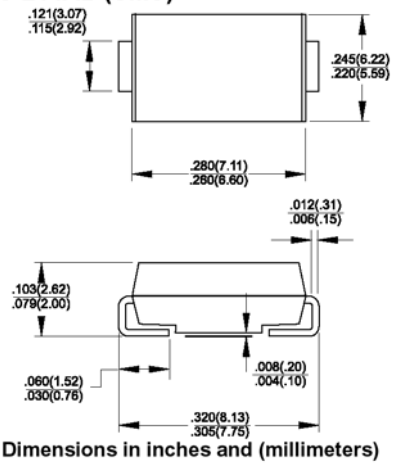
Surface Mount Transient Voltage Suppressors
Peak Pulse Power 1500W Stand-off Voltage 5.0 to 440V

Features

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Low profile package with built-in strain relief for surface mounted applications
- ◆ Glass passivated junction
- ◆ Low incremental surge resistance, excellent clamping capability
- ◆ 1500W peak pulse power capability with a 10/1000us waveform, repetition rate (duty cycle): 0.01%
- ◆ Very fast response time
- ◆ High temperature soldering guaranteed: 250°C/10 seconds at terminals



DO-214AB (SMC)



Dimensions in inches and (millimeters)

Mechanical Data

- ◆ Case: JEDEC DO-214AB(SMC J-Bend) molded plastic over passivated junction
- ◆ Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- ◆ Polarity: For unidirectional types the band denotes the cathode, which is positive with respect to the anode under normal TVS operation
- ◆ Weight: 0.007oz., 0.21g

Devices for Bidirectional Applications

For bi-directional devices, use suffix CA (e.g. SMCJ10CA). Electrical characteristics apply in both directions.

Maximum Ratings and Thermal Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified.)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation with a 10/1000us waveform (1) (2)	P_{PPM}	Minimum 1500	W
Peak pulse current with a 10/1000us waveform (1)	I_{PPM}	See Next Table	A
Peak forward surge current 8.3ms single half sine-wave uni-directional only (2)	I_{FSM}	200	A
Typical thermal resistance, junction to ambient (3)	$R_{\theta JA}$	75	°C/W
Typical thermal resistance, junction to lead	$R_{\theta JL}$	15	°C/W
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150	°C

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25°C per Fig. 2
2. Mounted on 0.31 x 0.31" (8.0 x 8.0 mm) copper pads to each terminal
3. Mounted on minimum recommended pad layout

Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified. V_F=3.5V at I_F=100A (uni-directional only)

Device type	Device marking code		Breakdown voltage $V_{(BR)}$ (Volts) (1)		Test current at I_T (mA)	Stand-off voltage V_{WM} (Volts)	Maximum reverse leakage at V_{WM} I_D (3) (uA)	Maximum peak pulse surge current I_{PPM} (2) (A)	Maximum clamping voltage at I_{PPM} V_C (Volts)
	UNI	BI	Min.	Max.					
SMCJ5.0	GDD	BDD	6.40	7.82	10	5.0	1000	156.3	9.6
SMCJ5.0A (5)	GDE	BDE	6.40	7.07	10	5.0	1000	163.0	9.2
SMCJ6.0	GDF	BDF	6.67	8.15	10	6.0	1000	131.6	11.4
SMCJ6.0A	GDG	BDG	6.67	7.37	10	6.0	1000	145.6	10.3
SMCJ6.5	GDH	BDH	7.22	8.82	10	6.5	500	122.0	12.3
SMCJ6.5A	GDK	BDK	7.22	7.98	10	6.5	500	133.9	11.2
SMCJ7.0	GDL	BDL	7.78	9.51	10	7.0	200	112.8	13.3
SMCJ7.0A	GDM	BDM	7.78	8.60	10	7.0	200	125.0	12.0
SMCJ7.5	GDN	BDN	8.33	10.2	1.0	7.5	100	104.9	14.3
SMCJ7.5A	GDP	BDP	8.33	9.21	1.0	7.5	100	116.3	12.9
SMCJ8.0	GDQ	BDQ	8.89	10.9	1.0	8.0	50	100.0	15.0
SMCJ8.0A	GDR	BDR	8.89	9.83	1.0	8.0	50	110.3	13.6
SMCJ8.5	GDS	BDS	9.44	11.5	1.0	8.5	20	94.3	15.9
SMCJ8.5A	GDT	BDT	9.44	10.4	1.0	8.5	20	104.2	14.4
SMCJ9.0	GDU	BDU	10.0	12.2	1.0	9.0	10.0	88.8	16.9
SMCJ9.0A	GDV	BDV	10.0	11.1	1.0	9.0	10.0	97.4	15.4
SMCJ10	GDW	BDW	11.1	13.6	1.0	10	5.0	79.8	18.8
SMCJ10A	GDX	BDX	11.1	12.3	1.0	10	5.0	88.2	17.0
SMCJ11	GDY	BDY	12.2	14.9	1.0	11	5.0	74.6	20.1
SMCJ11A	GDZ	BDZ	12.2	13.5	1.0	11	5.0	82.4	18.2
SMCJ12	GED	BED	13.3	16.3	1.0	12	5.0	68.2	22.0
SMCJ12A	GEE	BEE	13.3	14.7	1.0	12	5.0	75.4	19.9
SMCJ13	GEF	BEF	14.4	17.6	1.0	13	1.0	63.0	23.8
SMCJ13A	GEG	BEG	14.4	15.9	1.0	13	1.0	69.8	21.5
SMCJ14	GEH	BEH	15.6	19.1	1.0	14	1.0	58.1	25.8
SMCJ14A	GEK	BEK	15.6	17.2	1.0	14	1.0	64.7	23.2
SMCJ15	GEL	BEL	16.7	20.4	1.0	15	1.0	55.8	26.9
SMCJ15A	GEM	BEM	16.7	18.5	1.0	15	1.0	61.5	24.4
SMCJ16	GEN	BEN	17.8	21.8	1.0	16	1.0	52.1	28.8
SMCJ16A	GEP	BEP	17.8	19.7	1.0	16	1.0	57.7	26.0
SMCJ17	GEQ	BEQ	18.9	23.1	1.0	17	1.0	49.2	30.5
SMCJ17A	GER	BER	18.9	20.9	1.0	17	1.0	54.3	27.6
SMCJ18	GES	BES	20.0	24.4	1.0	18	1.0	46.6	32.2
SMCJ18A	GET	BET	20.0	22.1	1.0	18	1.0	51.4	29.2
SMCJ20	GEU	BEU	22.2	27.1	1.0	20	1.0	41.9	35.8
SMCJ20A	GEV	BEV	22.2	24.5	1.0	20	1.0	46.3	32.4
SMCJ22	GEW	BEW	24.4	29.8	1.0	22	1.0	38.1	39.4
SMCJ22A	GEX	BEX	24.4	26.9	1.0	22	1.0	42.3	35.5
SMCJ24	GEY	BEY	26.7	32.6	1.0	24	1.0	34.9	43.0
SMCJ24A	GEZ	BEZ	26.7	29.5	1.0	24	1.0	38.6	38.9
SMCJ26	GFD	BFD	28.9	35.3	1.0	26	1.0	32.2	46.6
SMCJ26A	GFE	BFE	28.9	31.9	1.0	26	1.0	35.6	42.1
SMCJ28	GFF	BFF	31.1	38.0	1.0	28	1.0	30.0	50.0
SMCJ28A	GFG	BFG	31.1	34.4	1.0	28	1.0	33.0	45.4
SMCJ30	GFH	BFH	33.3	40.7	1.0	30	1.0	28.0	53.5
SMCJ30A	GFK	BFK	33.3	36.8	1.0	30	1.0	31.0	48.4

Notes: 1. $V_{(BR)}$ measured after I_T applied for 300us square wave pulse or equivalent

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

3. For bi-directional 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

5. For the bi-directional SMCG/SMCJ5.0CA, the maximum $V_{(BR)}$ is 7.25V.

Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified. V_F=3.5V at I_F=100A (uni-directional only)

Device type	Device marking code		Breakdown voltage $V_{(BR)}$ (Volts) (1)		Test current at I_T (mA)	Stand-off voltage V_{WM} (Volts)	Maximum reverse leakage at V_{WM} I_D (3) (uA)	Maximum peak pulse surge current I_{PPM} (2) (A)	Maximum clamping voltage at I_{PPM} V_C (Volts)
	UNI	BI	Min.	Max.					
SMCJ33	GFL	BFL	36.7	44.9	1.0	33	1.0	25.4	59.0
SMCJ33A	GFM	BFM	36.7	40.6	1.0	33	1.0	28.1	53.3
SMCJ36	GFN	BFN	40.0	48.9	1.0	36	1.0	23.3	64.3
SMCJ36A	GFP	BFP	40.0	44.2	1.0	36	1.0	25.8	58.1
SMCJ40	GFQ	BFQ	44.4	54.3	1.0	40	1.0	21.0	71.4
SMCJ40A	GFR	BFR	44.4	49.1	1.0	40	1.0	23.3	64.5
SMCJ43	GFS	BFS	47.8	58.4	1.0	43	1.0	19.6	76.7
SMCJ43A	GFT	BFT	47.8	52.8	1.0	43	1.0	21.6	69.4
SMCJ45	GFU	BFU	50.0	61.1	1.0	45	1.0	18.7	80.3
SMCJ45A	GFV	BFV	50.0	55.3	1.0	45	1.0	20.6	72.7
SMCJ48	GFW	BFW	53.3	65.1	1.0	48	1.0	17.5	85.5
SMCJ48A	GFX	BFX	53.3	58.9	1.0	48	1.0	19.4	77.4
SMCJ51	GFY	BFY	56.7	69.3	1.0	51	1.0	16.5	91.1
SMCJ51A	GFZ	BFZ	56.7	62.7	1.0	51	1.0	18.2	82.4
SMCJ54	GGD	BGD	60.0	73.3	1.0	54	1.0	15.6	96.3
SMCJ54A	GGE	BGE	60.0	66.3	1.0	54	1.0	17.2	87.1
SMCJ58	GGF	BGF	64.4	78.7	1.0	58	1.0	14.6	103
SMCJ58A	GGG	BGG	64.4	71.2	1.0	58	1.0	16.0	93
SMCJ60	GGH	BGH	66.7	81.5	1.0	60	1.0	14.0	107
SMCJ60A	GGK	BGK	66.7	73.7	1.0	60	1.0	15.5	96
SMCJ64	GGL	BGL	71.1	86.9	1.0	64	1.0	13.2	114
SMCJ64A	GGM	BGM	71.1	78.6	1.0	64	1.0	14.6	103
SMCJ70	GGN	BGN	77.8	95.1	1.0	70	1.0	12.0	125
SMCJ70A	GGP	BGP	77.8	86.0	1.0	70	1.0	13.3	113
SMCJ75	GGQ	BGQ	83.3	102	1.0	75	1.0	11.2	134
SMCJ75A	GGR	BGR	83.3	92.1	1.0	75	1.0	12.4	121
SMCJ78	GGS	BGS	86.7	106	1.0	78	1.0	10.8	139
SMCJ78A	GGT	BGT	86.7	95.8	1.0	78	1.0	11.9	126
SMCJ85	GGU	BGU	94.4	115	1.0	85	1.0	9.9	151
SMCJ85A	GGV	BGV	94.4	104	1.0	85	1.0	10.9	137
SMCJ90	GGW	BGW	100	122	1.0	90	1.0	9.4	160
SMCJ90A	GGX	BGX	100	111	1.0	90	1.0	10.3	146
SMCJ100	GGY	BGY	111	136	1.0	100	1.0	8.4	179
SMCJ100A	GGZ	BGZ	111	123	1.0	100	1.0	9.3	162
SMCJ110	GHD	BHD	122	149	1.0	110	1.0	7.7	196
SMCJ110A	GHE	BHE	122	135	1.0	110	1.0	8.5	177
SMCJ120	GHF	BHF	133	163	1.0	120	1.0	7.0	214
SMCJ120A	GHG	BHG	133	147	1.0	120	1.0	7.8	193
SMCJ130	GHH	BHH	144	176	1.0	130	1.0	6.5	231
SMCJ130A	GHK	BHK	144	159	1.0	130	1.0	7.2	209
SMCJ150	GHL	BHL	167	204	1.0	150	1.0	5.6	268
SMCJ150A	GHM	BHM	167	185	1.0	150	1.0	6.2	243
SMCJ160	GHN	BHN	178	218	1.0	160	1.0	5.2	287
SMCJ160A	GHP	BHP	178	197	1.0	160	1.0	5.8	259
SMCJ170	GHQ	BHQ	189	231	1.0	170	1.0	4.9	304
SMCJ170A	GHR	BHR	189	209	1.0	170	1.0	5.5	275
SMCJ180A	GHT	BHT	209	222	1.0	180	1.0	5.0	292
SMCJ200A	GHV	BHV	224	247	1.0	200	1.0	4.6	324
SMCJ220A	GHX	BHX	246	272	1.0	220	1.0	4.2	356.
SMCJ250A	GHZ	BHZ	279	309	1.0	250	1.0	3.7	405
SMCJ300A	GJE	BJE	335	371	1.0	300	1.0	3.1	486
SMCJ350A	GJG	BJG	391	432	1.0	350	1.0	2.6	567
SMCJ400A	GJK	BJK	447	494	1.0	400	1.0	2.3	648
SMCJ440A	GJM	BJM	492	543	1.0	440	1.0	2.1	713

Notes: 1. $V_{(BR)}$ measured after I_T applied for 300us square wave pulse or equivalent

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

3. For bi-directional 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

5. For parts without A, the V_{BR} is +10%

RATINGS AND CHARACTERISTIC CURVES

(T_A = 25°C unless otherwise noted)

Fig. 1 – Peak Pulse Power Rating Curve

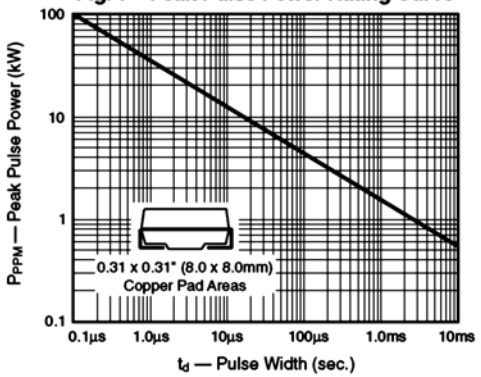


Fig. 2 – Pulse Derating Curve

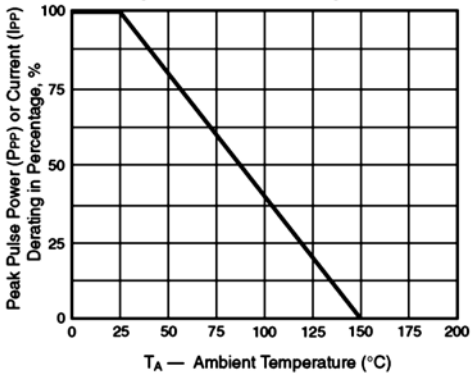


Fig. 3 – Pulse Waveform

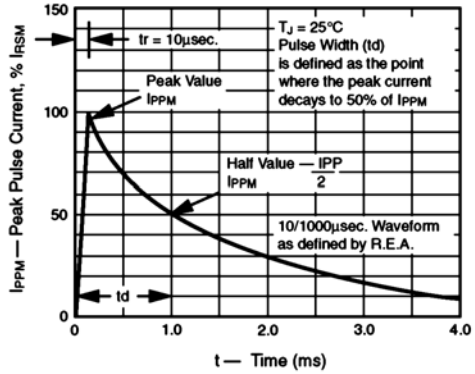


Fig. 4 – Typical Junction Capacitance Uni-Directional

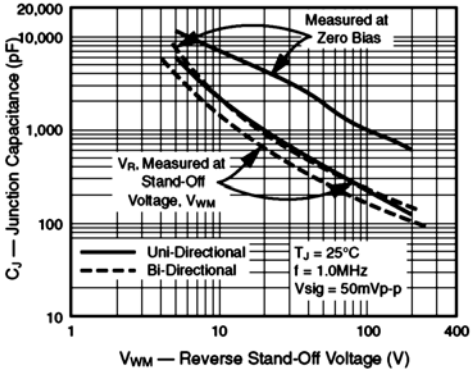


Fig. 5 – Typical Transient Thermal Impedance

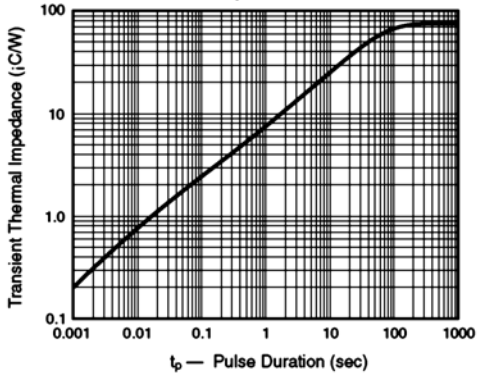


Fig. 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Use Only

