



DATA SHEET

SEMICONDUCTOR

5.0SMCJ Series

Surface Mount Transient Voltage Suppressors



Working Voltage: 11 to 440 V

Peak Pulse Power: 5000 W

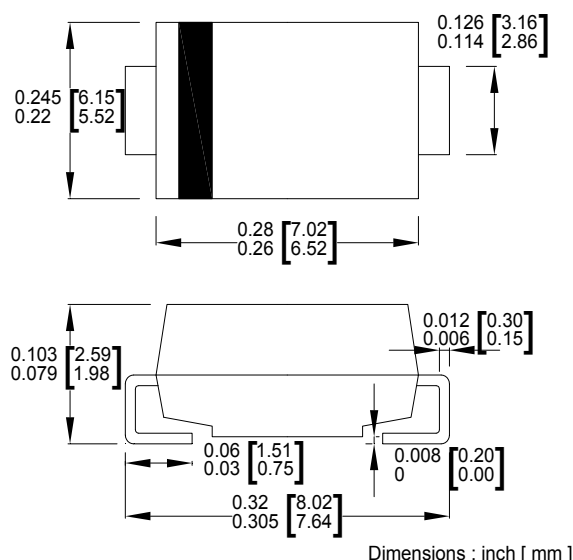
SMC/ DO-214AB

Features

- Glass passivated chip
- 5000 W peak pulse power capability with a 10/1000 μ s waveform, repetitive rate (duty cycle):0.01 %
- Low leakage
- Uni and Bidirectional unit
- Excellent clamping capability
- Very fast response time
- RoHS compliant

Mechanical Data

- Case: Molded plastic
- Epoxy: UL 94V-0 rate flame retardant
- Lead: Solderable per MIL-STD-750, method 2026
- Polarity: Color band denotes cathode end except Bipolar
- Mounting position: Any



Maximum Ratings($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	UNIT
Peak power dissipation with a 10/1000 μ s waveform ⁽¹⁾	P_{PP}	5000	W
Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾	I_{PP}	See Next Table	A
Power dissipation on infinite heatsink at $T_L = 75^{\circ}\text{C}$	P_D	6.5	W
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only ⁽²⁾	I_{FSM}	300	A
Maximum instantaneous forward voltage at 100 A for unidirectional only ⁽³⁾	V_F	3.5/5.0	V
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$

Note:

- (1)Non-repetitive current pulse per Fig.5 and derated above $T_A = 25^{\circ}\text{C}$ per Fig.1
- (2)Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
- (3) $V_F < 3.5\text{V}$ for devices of $V_{BR} < 200\text{V}$ and $V_F < 5.0\text{V}$ for devices of $V_{BR} > 201\text{V}$

DEVICE CHARACTERISTICS

5.0SMCJ Series

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

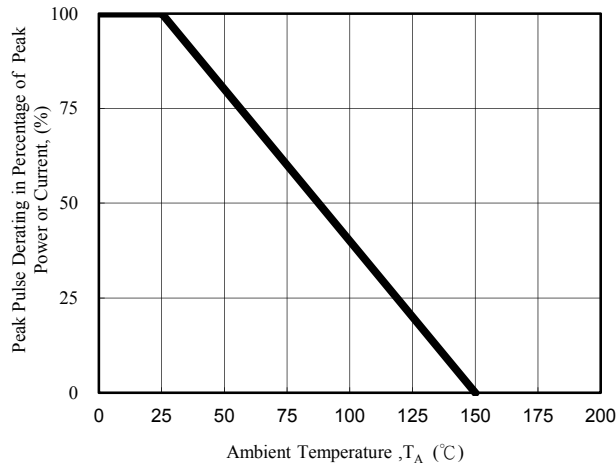


Fig. 1 - Pulse Derating Curve

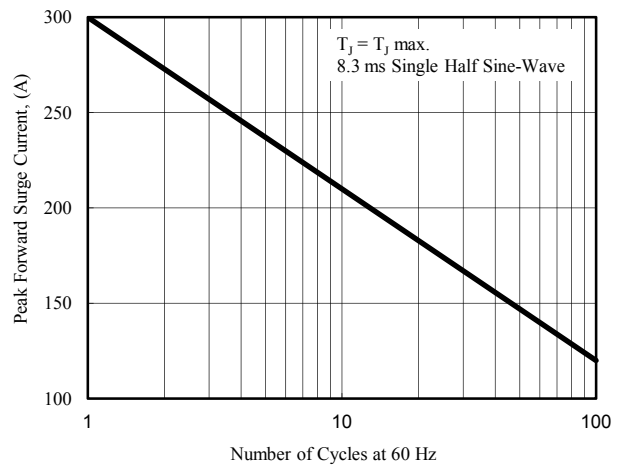


Fig. 2 - Maximum Non-Repetitive Surge Current

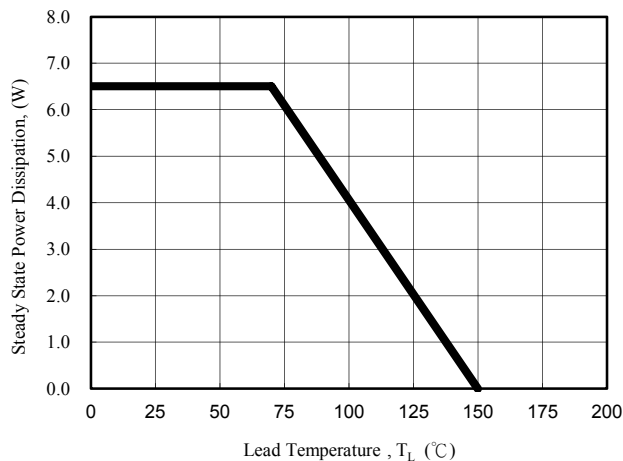


Fig. 3 - Steady State Power Derating Curve

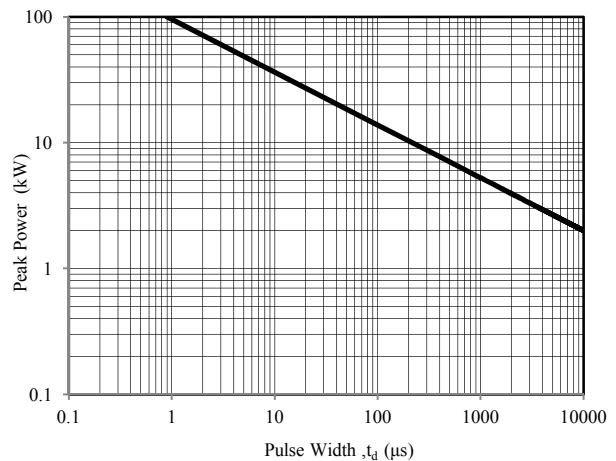


Fig. 4 - Peak Pulse Power Rating Curve

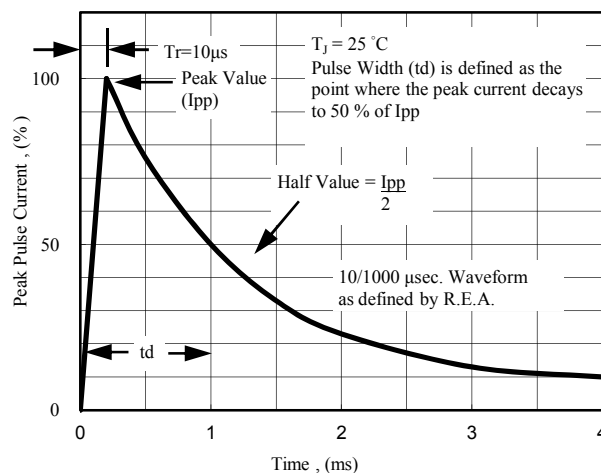


Fig. 5 - Pulse Waveform

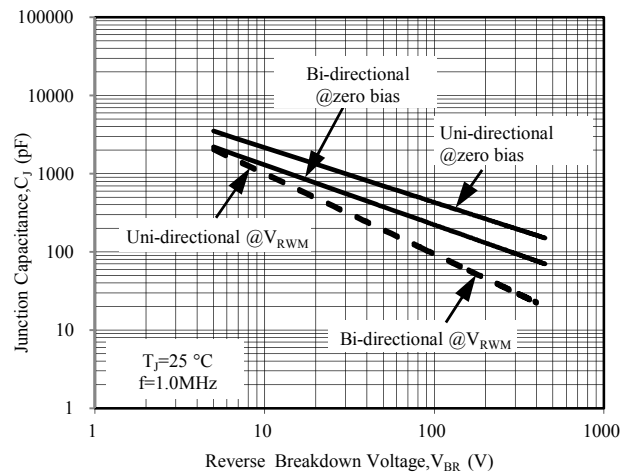


Fig. 6 - Typical Junction Capacitance

ELECTRICAL CHARACTERISTICS

5.0SMCJ Series

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

Part Number (Uni)	Part Number (Bi)	Device Marking Code		Breakdown Voltage V_{BR} @ I_T			Maximum Reverse Leakage I_R @ V_{RWM} (μA)	Working Peak Reverse Voltage V_{RWM} (V)	Maximum Reverse Surge Current I_{PP} (A)	Maximum Clamping Voltage V_C @ I_{PP} (V)
		Uni	Bi	Min (V)	Max (V)	I_T (mA)				
5.0SMCJ11	5.0SMCJ11C	5PDW	5BDW	12.20	14.90	10	800	11.0	248.8	20.1
5.0SMCJ11A	5.0SMCJ11CA	5PDX	5BDX	12.20	13.50	10	800	11.0	274.7	18.2
5.0SMCJ12	5.0SMCJ12C	5PDY	5BDY	13.30	16.30	10	800	12.0	227.3	22.0
5.0SMCJ12A	5.0SMCJ12CA	5PDZ	5BDZ	13.30	14.70	10	800	12.0	251.3	19.9
5.0SMCJ13	5.0SMCJ13C	5PED	5BED	14.40	17.60	10	500	13.0	210.1	23.8
5.0SMCJ13A	5.0SMCJ13CA	5PEE	5BEE	14.40	15.90	10	500	13.0	232.6	21.5
5.0SMCJ14	5.0SMCJ14C	5PEF	5BEF	15.60	19.10	10	200	14.0	193.8	25.8
5.0SMCJ14A	5.0SMCJ14CA	5PEG	5BEG	15.60	17.20	10	200	14.0	215.5	23.2
5.0SMCJ15	5.0SMCJ15C	5PEH	5BEH	16.70	20.40	1	100	15.0	185.9	26.9
5.0SMCJ15A	5.0SMCJ15CA	5PEK	5BEK	16.70	18.50	1	100	15.0	204.9	24.4
5.0SMCJ16	5.0SMCJ16C	5PEL	5BEL	17.80	21.80	1	50	16.0	173.6	28.8
5.0SMCJ16A	5.0SMCJ16CA	5PEM	5BEM	17.80	19.70	1	50	16.0	192.3	26.0
5.0SMCJ17	5.0SMCJ17C	5PEN	5BEN	18.90	23.10	1	20	17.0	163.9	30.5
5.0SMCJ17A	5.0SMCJ17CA	5PEP	5BEP	18.90	20.90	1	20	17.0	181.2	27.6
5.0SMCJ18	5.0SMCJ18C	5PEQ	5BEQ	20.00	24.40	1	10	18.0	155.3	32.2
5.0SMCJ18A	5.0SMCJ18CA	5PER	5BER	20.00	22.10	1	10	18.0	171.2	29.2
5.0SMCJ19	5.0SMCJ19C	5PES	5BES	21.13	25.76	1	10	19.0	147.0	34.0
5.0SMCJ19A	5.0SMCJ19CA	5PET	5BET	21.10	23.30	1	10	19.0	162.4	30.8
5.0SMCJ20	5.0SMCJ20C	5PEU	5BEU	22.20	27.10	1	5	20.0	139.7	35.8
5.0SMCJ20A	5.0SMCJ20CA	5PEV	5BEV	22.20	24.50	1	5	20.0	154.3	32.4
5.0SMCJ22	5.0SMCJ22C	5PEW	5BEW	24.40	29.80	1	5	22.0	126.9	39.4
5.0SMCJ22A	5.0SMCJ22CA	5PEX	5BEX	24.40	26.90	1	5	22.0	140.8	35.5
5.0SMCJ24	5.0SMCJ24C	5PEY	5BEY	26.70	32.60	1	5	24.0	116.3	43.0
5.0SMCJ24A	5.0SMCJ24CA	5PEZ	5BEZ	26.70	29.50	1	5	24.0	128.5	38.9
5.0SMCJ26	5.0SMCJ26C	5PFD	5BFD	28.90	35.30	1	5	26.0	107.3	46.6
5.0SMCJ26A	5.0SMCJ26CA	5PFE	5BFE	28.90	31.90	1	5	26.0	118.8	42.1
5.0SMCJ28	5.0SMCJ28C	5PFF	5BFF	31.10	38.00	1	5	28.0	100.0	50.0
5.0SMCJ28A	5.0SMCJ28CA	5PFG	5BFG	31.10	34.40	1	5	28.0	110.1	45.4
5.0SMCJ30	5.0SMCJ30C	5PFH	5BFH	33.30	40.70	1	5	30.0	93.5	53.5
5.0SMCJ30A	5.0SMCJ30CA	5PFK	5BFK	33.30	36.80	1	5	30.0	103.3	48.4
5.0SMCJ33	5.0SMCJ33C	5PFL	5BFL	36.70	44.90	1	5	33.0	84.7	59.0
5.0SMCJ33A	5.0SMCJ33CA	5PFM	5BFM	36.70	40.60	1	5	33.0	93.8	53.3
5.0SMCJ36	5.0SMCJ36C	5PFN	5BFN	40.00	48.90	1	5	36.0	77.8	64.3
5.0SMCJ36A	5.0SMCJ36CA	5PFP	5BFP	40.00	44.20	1	5	36.0	86.1	58.1
5.0SMCJ40	5.0SMCJ40C	5PFQ	5BFQ	44.40	54.30	1	5	40.0	70.0	71.4
5.0SMCJ40A	5.0SMCJ40CA	5PFR	5BFR	44.40	49.10	1	5	40.0	77.5	64.5
5.0SMCJ43	5.0SMCJ43C	5PFS	5BFS	47.80	58.40	1	5	43.0	65.2	76.7
5.0SMCJ43A	5.0SMCJ43CA	5PFT	5BFT	47.80	52.80	1	5	43.0	72.0	69.4
5.0SMCJ45	5.0SMCJ45C	5PFU	5BFU	50.00	61.10	1	5	45.0	62.3	80.3
5.0SMCJ45A	5.0SMCJ45CA	5PFV	5BFV	50.00	55.30	1	5	45.0	68.8	72.7
5.0SMCJ48	5.0SMCJ48C	5PFW	5BFW	53.30	65.10	1	5	48.0	58.5	85.5
5.0SMCJ48A	5.0SMCJ48CA	5PFX	5BFX	53.30	58.90	1	5	48.0	64.6	77.4
5.0SMCJ51	5.0SMCJ51C	5PFY	5BFY	56.70	69.30	1	5	51.0	54.9	91.1
5.0SMCJ51A	5.0SMCJ51CA	5PFZ	5BFZ	56.70	62.70	1	5	51.0	60.7	82.4
5.0SMCJ54	5.0SMCJ54C	5PGD	5BGD	60.00	73.30	1	5	54.0	51.9	96.3
5.0SMCJ54A	5.0SMCJ54CA	5PGE	5BGE	60.00	66.30	1	5	54.0	57.4	87.1
5.0SMCJ58	5.0SMCJ58C	5PGF	5BGF	64.40	78.70	1	5	58.0	48.5	103.0
5.0SMCJ58A	5.0SMCJ58CA	5PGG	5BGH	64.40	71.20	1	5	58.0	53.4	93.6
5.0SMCJ60	5.0SMCJ60C	5PGH	5BGH	66.70	81.50	1	5	60.0	46.7	107.0
5.0SMCJ60A	5.0SMCJ60CA	5PGK	5BGK	66.70	73.70	1	5	60.0	51.7	96.8
5.0SMCJ64	5.0SMCJ64C	5PGL	5BGL	71.10	86.90	1	5	64.0	43.9	114.0
5.0SMCJ64A	5.0SMCJ64CA	5PGM	5BGM	71.10	78.60	1	5	64.0	48.5	103.0

Note:

- Suffix 'A' denotes 5% tolerance device. Without 'A' denotes 10% tolerance device
- Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
- For Bi-Directional devices having V_R of 10 volts and under, the I_R limit is double

ELECTRICAL CHARACTERISTICS

5.0SMCJ Series

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

Part Number (Uni)	Part Number (Bi)	Device Marking Code		Breakdown Voltage V_{BR} @ I_T			Maximum Reverse Leakage I_R @ V_{RWM} (μA)	Working Peak Reverse Voltage V_{RWM} (V)	Maximum Reverse Surge Current I_{PP} (A)	Maximum Clamping Voltage V_C @ I_{PP} (V)
		Uni	Bi	Min (V)	Max (V)	I_T (mA)				
5.0SMCJ70	5.0SMCJ70C	5PGN	5BGN	77.80	95.10	1	5	70.0	40.0	125.0
5.0SMCJ70A	5.0SMCJ70CA	5PGP	5BGP	77.80	86.00	1	5	70.0	44.2	113.0
5.0SMCJ75	5.0SMCJ75C	5PGQ	5BGQ	83.30	102.0	1	5	75.0	37.3	134.0
5.0SMCJ75A	5.0SMCJ75CA	5PGR	5BGR	83.30	92.10	1	5	75.0	41.3	121.0
5.0SMCJ78	5.0SMCJ78C	5PGS	5BGS	86.70	106.0	1	5	78.0	36.0	139.0
5.0SMCJ78A	5.0SMCJ78CA	5PGT	5BGT	86.70	95.80	1	5	78.0	39.7	126.0
5.0SMCJ80	5.0SMCJ80C	5PGA	5BGA	88.96	108.8	1	5	80.0	34.9	143.2
5.0SMCJ80A	5.0SMCJ80CA	5PGB	5BGB	88.80	97.60	1	5	80.0	38.6	129.6
5.0SMCJ85	5.0SMCJ85C	5PGU	5BGU	94.40	115.0	1	5	85.0	33.1	151.0
5.0SMCJ85A	5.0SMCJ85CA	5PGV	5BGV	94.40	104.0	1	5	85.0	36.5	137.0
5.0SMCJ90	5.0SMCJ90C	5PGW	5BGW	100.0	122.0	1	5	90.0	31.3	160.0
5.0SMCJ90A	5.0SMCJ90CA	5PGX	5BGX	100.0	111.0	1	5	90.0	34.2	146.0
5.0SMCJ100	5.0SMCJ100C	5PGY	5BGY	111.0	136.0	1	5	100.0	27.9	179.0
5.0SMCJ100A	5.0SMCJ100CA	5PGZ	5BGZ	111.0	123.0	1	5	100.0	30.9	162.0
5.0SMCJ110	5.0SMCJ110C	5PHD	5BHD	122.0	149.0	1	5	110.0	25.5	196.0
5.0SMCJ110A	5.0SMCJ110CA	5PHE	5BHE	122.0	135.0	1	5	110.0	28.2	177.0
5.0SMCJ120	5.0SMCJ120C	5PHF	5BHF	133.0	163.0	1	5	120.0	23.4	214.0
5.0SMCJ120A	5.0SMCJ120CA	5PHG	5BHG	133.0	147.0	1	5	120.0	25.9	193.0
5.0SMCJ130	5.0SMCJ130C	5PHH	5BHH	144.0	176.0	1	5	130.0	21.6	231.0
5.0SMCJ130A	5.0SMCJ130CA	5PHK	5BHK	144.0	159.0	1	5	130.0	23.9	209.0
5.0SMCJ140	5.0SMCJ140C	5PHA	5BHA	155.7	190.4	1	5	140.0	20.0	250.6
5.0SMCJ140A	5.0SMCJ140CA	5PHB	5BHB	155.0	171.0	1	5	140.0	22.0	226.8
5.0SMCJ150	5.0SMCJ150C	5PHL	5BHL	167.0	204.0	1	5	150.0	18.7	268.0
5.0SMCJ150A	5.0SMCJ150CA	5PHM	5BHM	167.0	185.0	1	5	150.0	20.6	243.0
5.0SMCJ160	5.0SMCJ160C	5PHN	5BHN	178.0	218.0	1	5	160.0	17.4	287.0
5.0SMCJ160A	5.0SMCJ160CA	5PHP	5BHP	178.0	197.0	1	5	160.0	19.3	259.0
5.0SMCJ170	5.0SMCJ170C	5PHQ	5BHQ	189.0	231.0	1	5	170.0	16.4	304.0
5.0SMCJ170A	5.0SMCJ170CA	5PHR	5BHR	189.0	209.0	1	5	170.0	18.2	275.0
5.0SMCJ180	5.0SMCJ180C	5PHS	5BHS	200.2	244.8	1	5	180.0	15.5	322.2
5.0SMCJ180A	5.0SMCJ180CA	5PHT	5BHT	200.0	220.0	1	5	180.0	17.1	291.6
5.0SMCJ190	5.0SMCJ190C	5PHU	5BHU	211.3	258.4	1	5	190.0	14.7	340.1
5.0SMCJ190A	5.0SMCJ190CA	5PHV	5BHV	211.0	232.0	1	5	190.0	16.2	307.8
5.0SMCJ200A	5.0SMCJ200CA	5PHW	5BHW	224.0	247.0	1	5	200.0	15.4	324.0
5.0SMCJ220A	5.0SMCJ220CA	5PHX	5BHX	246.0	272.0	1	5	220.0	14.0	356.0
5.0SMCJ250A	5.0SMCJ250CA	5PHZ	5BHZ	279.0	309.0	1	5	250.0	12.3	405.0
5.0SMCJ300A	5.0SMCJ300CA	5PJE	5BJE	335.0	371.0	1	5	300.0	10.3	486.0
5.0SMCJ350A	5.0SMCJ350CA	5PJG	5BJG	391.0	432.0	1	5	350.0	8.8	567.0
5.0SMCJ400A	5.0SMCJ400CA	5PJK	5BJK	447.0	494.0	1	5	400.0	7.7	648.0
5.0SMCJ440A	5.0SMCJ440CA	5PJM	5BJM	492.0	543.0	1	5	440.0	7.0	713.0