1500W, 5V - 170V Surface Mount Transient Voltage Suppressor

FEATURES

- Ideal for automated placement
- Glass passivated junction
- Excellent clamping capability
- Fast response time: Typically less than 1.0ps from 0 V to BV min
- Typical I_R less than 1μA above 10V
- Moisture sensitivity level: level 1, per J-STD-020
- AEC-Q101 qualified available: ordering code with suffix “H”
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{WM}	5 - 170	V
V_{BR}	6.4 - 231	V
P_{PK}	1500	W
$T_{J\ MAX}$	150	°C
Package	DO-214AB (SMC)	
Configuration	Single die	

Pb-Free RoHS COMPLIANT

APPLICATIONS

- Immunization of sensitive devices in automotive, telecommunications, consumer electronics, and industrial equipment from electrostatic discharge (ESD) and transient voltages induced by load switching and lightning.

DO-214AB (SMC)

MECHANICAL DATA

- Case：DO-214AB (SMC)
- Molding compound meets UL 94V-0 flammability rating
- Terminal：Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity：As marked
- Weight： 0.210 g (approximately)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Peak power dissipation at T_A=25°C, tp=1ms[1]	P_{PK}	1500	W
Steady state power dissipation at T_A=25°C	P_D	5	W
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200	A
Forward Voltage @ I_F=100A for Unidirectional only [2]	V_F	3.5 / 5.0	V
Junction temperature	T_J	-55 to +150	°C
Storage temperature	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. V_F=3.5V on SMCJ5.0 - SMCJ90 devices and V_F=5.0V on SMCJ100 - SMCJ170 devices

Devices for bipolar applications

1. For bidirectional use C or CA suffix for types SMCJ5.0 - types SMCJ170
2. Electrical characteristics apply in both directions

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-ambient thermal resistance	$R_{\Theta JA}$	55	°C/W
Junction-to-case thermal resistance	$R_{\Theta JC}$	10	°C/W

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

Part number	Marking code	Breakdown voltage V_{BR}@I_T (V)		Test current I_T (mA)	Working stand-off voltage V_{WM} (V)	Maximum Reverse Leakage (Note 3) I_R@V_{WM} (μA)	Maximum peak impulse current (Note 2) I_{PPM} (A)	Maximum clamping voltage (Note 2) V_C@I_{PPM} (V)
		MIN.	MAX.					
SMCJ5.0	GDD	6.4	7.3	10	5	1000	164	9.6
SMCJ5.0A	GDE	6.4	7	10	5	1000	171	9.2
SMCJ6.0	GDF	6.67	8.15	10	6	1000	138	11.4
SMCJ6.0A	GDG	6.67	7.37	10	6	1000	152	10.3
SMCJ6.5	GDH	7.22	8.82	10	6.5	500	128	12.3
SMCJ6.5A	GDK	7.22	7.98	10	6.5	500	140	11.2
SMCJ7.0	GDL	7.78	9.51	10	7	200	118	13.3
SMCJ7.0A	GDM	7.78	8.6	10	7	200	131	12.0
SMCJ7.5	GDN	8.33	10.30	1	7.5	100	110	14.3
SMCJ7.5A	GDP	8.33	9.21	1	7.5	100	122	12.9
SMCJ8.0	GDQ	8.89	10.9	1	8	50	105	15.0
SMCJ8.0A	GDR	8.89	9.83	1	8	50	115	13.6
SMCJ8.5	GDS	9.44	11.5	1	8.5	20	99	15.9
SMCJ8.5A	GDT	9.44	10.4	1	8.5	20	109	14.4
SMCJ9.0	GDU	10	12.2	1	9	10	93	16.9
SMCJ9.0A	GDV	10	11.1	1	9	10	102	15.4
SMCJ10	GDW	11.1	13.6	1	10	5	83	18.8
SMCJ10A	GDX	11.1	12.3	1	10	5	92	17.0
SMCJ11	GDY	12.2	14.9	1	11	1	78	20.1
SMCJ11A	GDZ	12.2	13.5	1	11	1	86	18.2
SMCJ12	GED	13.3	16.3	1	12	1	71	22.0
SMCJ12A	GEE	13.3	14.7	1	12	1	79	19.9
SMCJ13	GEF	14.4	17.6	1	13	1	66	23.8
SMCJ13A	GEG	14.4	15.9	1	13	1	73	21.5
SMCJ14	GEH	15.6	19.1	1	14	1	61	25.8
SMCJ14A	GEK	15.6	17.2	1	14	1	67	23.2
SMCJ15	GEL	16.7	20.4	1	15	1	58	26.9
SMCJ15A	GEM	16.7	18.5	1	15	1	64	24.4
SMCJ16	GEN	17.8	21.8	1	16	1	54	28.8
SMCJ16A	GEP	17.8	19.7	1	16	1	60	26.0
SMCJ17	GEQ	18.9	23.1	1	17	1	51	30.5
SMCJ17A	GER	18.9	20.9	1	17	1	57	27.6
SMCJ18	GES	20	24.4	1	18	1	48	32.2
SMCJ18A	GET	20	22.1	1	18	1	53	29.2
SMCJ20	GEU	22.2	27.1	1	20	1	43	35.8
SMCJ20A	GEV	22.2	24.5	1	20	1	48	32.4
SMCJ22	GEW	24.4	29.8	1	22	1	39	39.4
SMCJ22A	GEX	24.4	26.9	1	22	1	44	35.5
SMCJ24	GEY	26.7	32.6	1	24	1	36	43.0
SMCJ24A	GEZ	26.7	29.5	1	24	1	40	38.9
SMCJ26	GFD	28.9	35.3	1	26	1	33	46.6
SMCJ26A	GFE	28.9	31.9	1	26	1	37	42.1
SMCJ28	GFF	31.1	38	1	28	1	31	50.0

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)								
Part number	**Marking code**	**Breakdown voltage** V_{BR}@I_T (V)		**Test current** I_T (mA)	**Working stand-off voltage** V_{WM} (V)	**Maximum Reverse Leakage** (Note 3) I_R@V_{WM} (μA)	**Maximum peak impulse current** (Note 2) I_{PPM} (A)	**Maximum clamping voltage** (Note 2) V_C@I_{PPM} (V)
		MIN.	MAX.					
SMCJ28A	GFG	31.1	34.4	1	28	1	34	45.4
SMCJ30	GFH	33.3	40.7	1	30	1	29	53.5
SMCJ30A	GFK	33.3	36.8	1	30	1	32	48.4
SMCJ33	GFL	36.7	44.9	1	33	1	26	59.0
SMCJ33A	GFM	36.7	40.6	1	33	1	29	53.3
SMCJ36	GFN	40	48.9	1	36	1	24	64.3
SMCJ36A	GFP	40	44.2	1	36	1	27	58.1
SMCJ40	GFQ	44.4	54.3	1	40	1	22	71.4
SMCJ40A	GFR	44.4	49.1	1	40	1	24	64.5
SMCJ43	GFS	47.8	58.4	1	43	1	20	76.7
SMCJ43A	GFT	47.8	52.8	1	43	1	22	69.4
SMCJ45	GFU	50	61.1	1	45	1	19	80.3
SMCJ45A	GFV	50	55.3	1	45	1	21	72.7
SMCJ48	GFW	53.3	65.1	1	48	1	18	85.5
SMCJ48A	GFX	53.3	58.9	1	48	1	20	77.4
SMCJ51	GFY	56.7	69.3	1	51	1	17	91.1
SMCJ51A	GFZ	56.7	62.7	1	51	1	19	82.4
SMCJ54	GGD	60	73.3	1	54	1	16	96.3
SMCJ54A	GGE	60	66.3	1	54	1	18	87.1
SMCJ58	GGF	64.4	78.7	1	58	1	15	103
SMCJ58A	GGG	64.4	71.2	1	58	1	16	93.6
SMCJ60	GGH	66.7	81.5	1	60	1	14	107
SMCJ60A	GGK	66.7	73.7	1	60	1	16	96.8
SMCJ64	GGL	71.1	86.9	1	64	1	13.8	114
SMCJ64A	GGM	71.1	78.6	1	64	1	15	103
SMCJ70	GGN	77.8	95.1	1	70	1	12.6	125
SMCJ70A	GGP	77.8	86	1	70	1	13.9	113
SMCJ75	GGQ	83.3	102	1	75	1	11.7	134
SMCJ75A	GGR	83.3	92.1	1	75	1	13	121
SMCJ78	GGS	86.7	106	1	78	1	11.3	139
SMCJ78A	GGT	86.7	95.8	1	78	1	12.5	126
SMCJ85	GGU	94.4	115	1	85	1	10.4	151
SMCJ85A	GGV	94.4	104	1	85	1	11.5	137
SMCJ90	GGW	100	122	1	90	1	9.8	160
SMCJ90A	GGX	100	111	1	90	1	10.7	146
SMCJ100	GGY	111	136	1	100	1	8.8	179
SMCJ100A	GGZ	111	123	1	100	1	9.7	162
SMCJ110	GHD	122	149	1	110	1	8	196
SMCJ110A	GHE	122	135	1	110	1	8.9	177
SMCJ120	GHF	133	163	1	120	1	7.3	214
SMCJ120A	GHG	133	147	1	120	1	8.1	193
SMCJ130	GHH	144	176	1	130	1	6.8	231
SMCJ130A	GHK	144	159	1	130	1	7.5	209
SMCJ150	GHL	167	204	1	150	1	5.8	266
SMCJ150A	GHM	167	185	1	150	1	6.4	243
SMCJ160	GHN	178	218	1	160	1	5.4	287
SMCJ160A	GHP	178	197	1	160	1	6	259
SMCJ170	GHQ	189	231	1	170	1	5.1	304
SMCJ170A	GHR	189	209	1	170	1	5.7	275

Notes:

1. V_{BR} measure after I_T applied for 300μs, I_T=square wave pulse or equivalent
2. Surge current waveform per Figure. 3 and derate per Figure. 2
3. For bipolar types having V_{WM} of 10 V and under, the I_R limit is doubled
4. All terms and symbols are consistent with ANSI/IEEE C62.35

ORDERING INFORMATION		
ORDERING CODE (Note 1, 2,3)	**PACKAGE**	**PACKING**
SMCJxxxxHV7G	SMC	850 / 7" reel
SMCJxxxxHV6G	SMC	3,000 / 13" reel
SMCJxxxx V7G	SMC	850 / 7" reel
SMCJxxxx V6G	SMC	3,000 / 13" reel

Note 1:
"xxxx" defines voltage from 5.0V (SMCJ5.0) to 170V (SMCJ170A)

Note 2:
"H" means AEC-Q101 qualified

Note 3:
“G” means green compound (halogen free)

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Peak Pulse Power Rating Curve

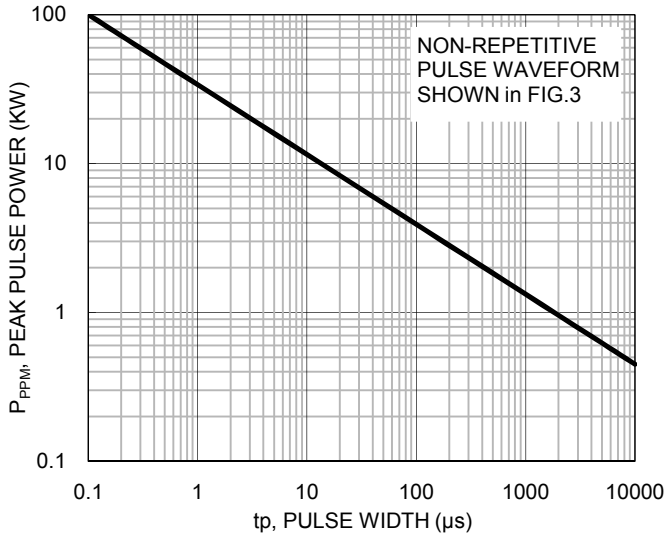


Fig.2 Pulse Derating Curve

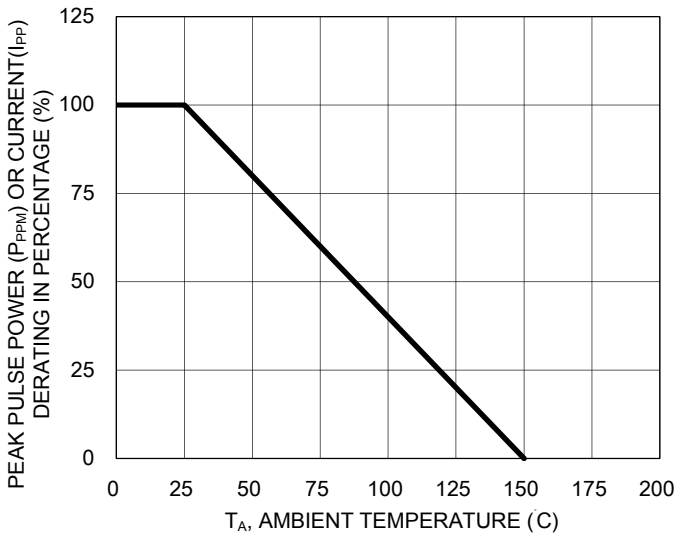


Fig.3 Clamping Power Pulse Waveform

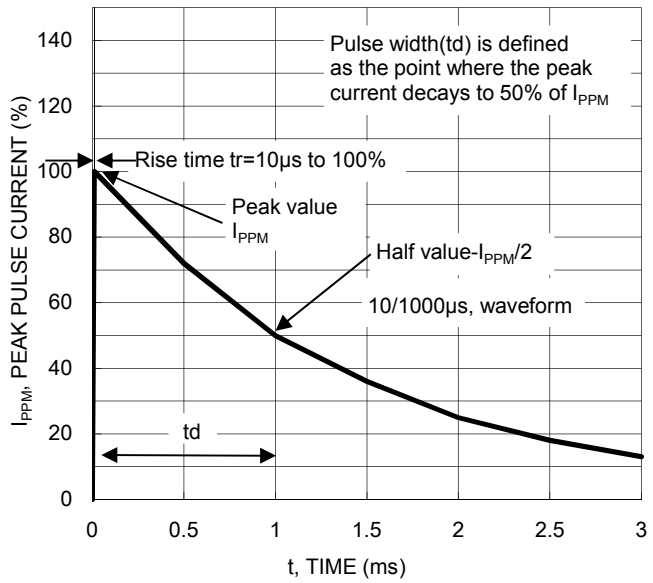
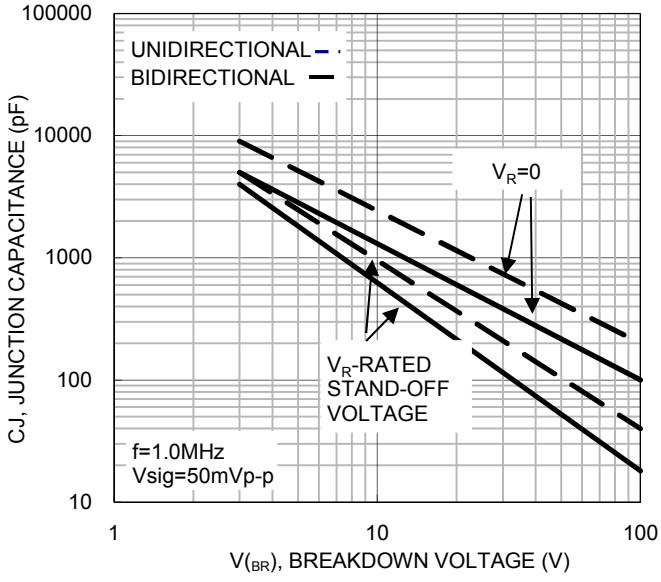


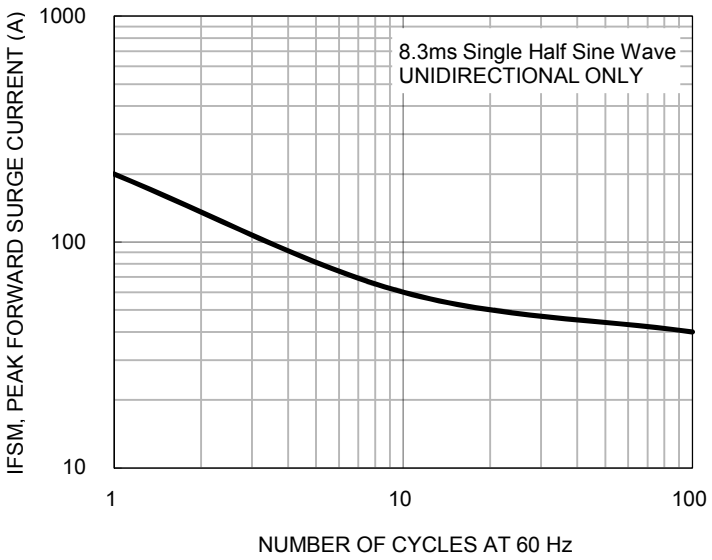
Fig.4 Typical Junction Capacitance



CHARACTERISTICS CURVES

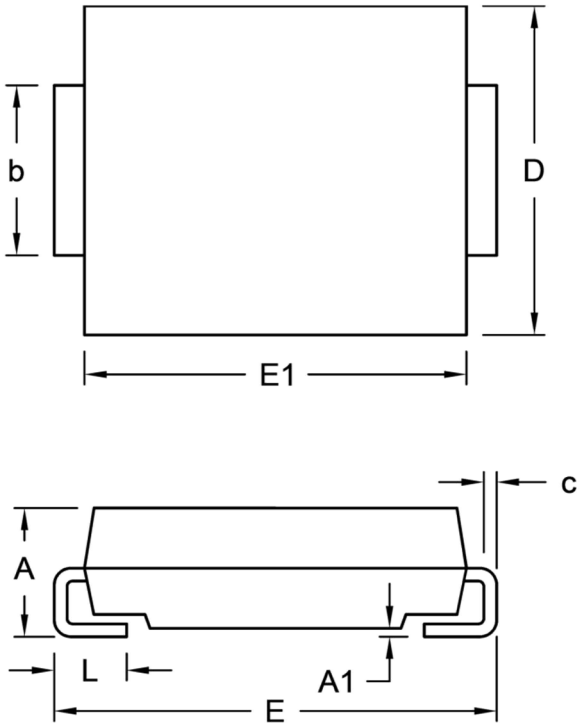
(T_A = 25°C unless otherwise noted)

Fig.5 Maximum Non-repetitive Forward Surge Current



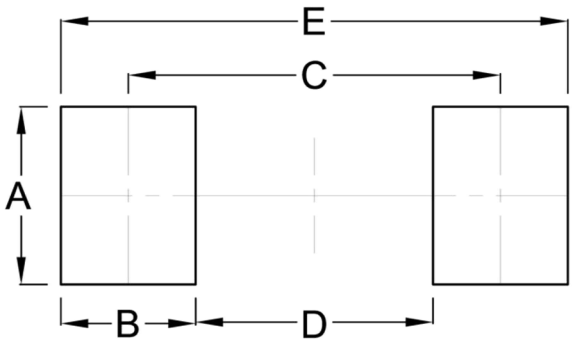
PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

DO-214AB (SMC)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	2.00	2.62	0.079	0.103
A1	0.10	0.20	0.004	0.008
b	2.90	3.20	0.114	0.126
c	0.15	0.31	0.006	0.012
D	5.59	6.22	0.220	0.245
E	7.75	8.13	0.305	0.320
E1	6.60	7.11	0.260	0.280
L	1.00	1.60	0.039	0.063

SUGGESTED PAD LAYOUT



Symbol	Unit (mm)	Unit (inch)
A	3.30	0.130
B	2.50	0.098
C	6.90	0.272
D	4.40	0.173
E	9.40	0.370

MARKING DIAGRAM

SMC(1)

P/N = Marking Code
G = Green Compound
YW = Date Code
F = Factory Code

Note(1): Cathode band for unidirectional products only

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Purchasers are solely responsible for the choice, selection, and use of TSC products and TSC assumes no liability for application assistance or the design of Purchasers' products.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Taiwan Semiconductor:

SMCJ188A SMCJ188CA SMCJ440A R6G SMCJ200A R7G SMCJ220CA R6 SMCJ300A R7G SMCJ300A R6 SMCJ440A R7 SMCJ250A R6 SMCJ440CA R6G SMCJ300CA R6 SMCJ220CA R7 SMCJ400A R7G SMCJ300A R7 SMCJ350CA R7 SMCJ350CA R7G SMCJ400CA R6G SMCJ220CA R7G SMCJ220CA R6G SMCJ440CA R7 SMCJ220A R6G SMCJ400CA R7G SMCJ220A R6 SMCJ400A R6 SMCJ250A R6G SMCJ250CA R6 SMCJ300CA R7G SMCJ440CA R6 SMCJ400A R7 SMCJ220A R7 SMCJ220A R7G SMCJ250A R7 SMCJ350A R6 SMCJ400CA R7 SMCJ200CA R7G SMCJ350CA R6G SMCJ440CA R7G SMCJ440A R7G SMCJ200CA R7 SMCJ300CA R7 SMCJ200CA R6G SMCJ200A R6G SMCJ440A R6 SMCJ200CA R6 SMCJ400CA R6 SMCJ250CA R7G SMCJ350A R7G SMCJ350A R6G SMCJ250A R7G SMCJ300A R6G SMCJ250CA R7 SMCJ400A R6G SMCJ200A R7 SMCJ250CA R6G SMCJ350CA R6 SMCJ200A R6 SMCJ350A R7 SMCJ300CA R6G SMCJ60CA R7 SMCJ51CA R7 SMCJ70A R6 SMCJ26CA R7 SMCJ90CA R7 SMCJ160CA R7 SMCJ75CA R7 SMCJ150CA R7 SMCJ58A R7 SMCJ100CA R7 SMCJ70CA R7 SMCJ160A R7 SMCJ110A R7 SMCJ54CA R7 SMCJ110CA R7 SMCJ100A R7 SMCJ78A R7 SMCJ45CA R7 SMCJ45A R7 SMCJ64CA R7 SMCJ60A R7 SMCJ120A R7 SMCJ85CA R7 SMCJ7.5CA R6 G SMCJ10 V6G SMCJ100 V6G SMCJ100C V6G SMCJ10C V6G SMCJ85 V6G SMCJ85C V6G SMCJ90 V6G SMCJ90C V6G SMCJ78 V6G SMCJ78C V6G SMCJ70 V6G SMCJ70C V6G SMCJ75 V6G SMCJ75C V6G SMCJ64 V6G SMCJ64C V6G SMCJ58 V6G SMCJ58C V6G