

# 1500W, 6.8V - 200V Surface Mount Transient Voltage Suppressor

## FEATURES

- AEC-Q101 qualified
- Ideal for automated placement
- Glass passivated chip junction
- Excellent clamping capability
- Meets ISO 7637-2 (Pulse 1/2a/2b/3a/3b)
- Fast response time: Typically less than 1.0ps
- Typical  $I_R$  less than  $1\mu A$  above 10V
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$V_{WM}$	5.5 - 171	V
$V_{BR}$	6.8 - 200	V
$P_{PK}$	1500	W
$T_{JMAX}$	150	°C
Package	DO-214AB (SMC)	
Configuration	Single die	

## APPLICATIONS

- Immunization of sensitive devices in 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: 0.210g (approximately)

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak power dissipation at $T_A = 25^\circ C$ , $t_p = 1ms^{(1)}$	$P_{PK}$	1500	W
Steady state power dissipation at $T_A = 25^\circ C$	$P_D$	6.5	W
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load for Unidirectional only	$I_{FSM}$	200	A
Forward Voltage @ $I_F = 50A$ for Unidirectional only <sup>(2)</sup>	$V_F$	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.5 and derated above  $T_A = 25^\circ C$  per Fig.2
2.  $V_F = 3.5V$  on 1.5SMC6.8H - 1.5SMC91H and  $V_F = 5.0V$  on 1.5SMC100H - 1.5SMC200H

### Devices for Bipolar Applications

1. For bidirectional use CH or CAH suffix for types 1.5SMC6.8H - types 1.5SMC200AH
2. Electrical characteristics apply in both directions

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	TYP	UNIT
Junction-to-ambient thermal resistance	$R_{\theta JA}$	50	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	15	°C/W

ELECTRICAL SPECIFICATIONS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)									
Part number	Marking code	Breakdown voltage (Note 1) $V_{BR}@I_T$ (V)		Test current $I_T$ (mA)	Working stand-off voltage $V_{WM}$ (V)	Maximum blocking leakage current $I_R@V_{WM}$ ( $\mu\text{A}$ )	Maximum peak impulse current (Note 2) $I_{PPM}$ (A)	Maximum clamping voltage $V_C@I_{PPM}$ (V)	Maximum Temperature Coefficient of $V_{BR}$ (%/°C)
		Min	Max						
1.5SMC6.8H	DDJ	6.12	7.48	10	5.50	1000	145	10.8	0.057
1.5SMC6.8AH	DEJ	6.46	7.14	10	5.80	1000	150	10.5	0.057
1.5SMC7.5H	DFJ	6.75	8.25	10	6.05	500	134	11.7	0.061
1.5SMC7.5AH	DGJ	7.13	7.88	10	6.40	500	139	11.3	0.061
1.5SMC8.2H	DHJ	7.38	9.02	10	6.63	200	126	12.5	0.065
1.5SMC8.2AH	DKJ	7.79	8.61	10	7.02	200	130	12.1	0.065
1.5SMC9.1H	DLJ	8.19	10.00	1.0	7.37	50	114	13.8	0.068
1.5SMC9.1AH	DMJ	8.65	9.55	1.0	7.78	50	117	13.4	0.068
1.5SMC10H	DNJ	9.00	11.00	1.0	8.10	10	105	15.0	0.073
1.5SMC10AH	DPJ	9.50	10.5	1.0	8.55	10	108	14.5	0.073
1.5SMC11H	DQJ	9.90	12.1	1.0	8.92	1	97	16.2	0.075
1.5SMC11AH	DRJ	10.5	11.6	1.0	9.40	1	100	15.6	0.075
1.5SMC12H	DSJ	10.8	13.2	1.0	9.72	1	91	17.3	0.078
1.5SMC12AH	DTJ	11.4	12.6	1.0	10.2	1	94	16.7	0.078
1.5SMC13H	DUJ	11.7	14.3	1.0	10.5	1	82	19.0	0.081
1.5SMC13AH	DVJ	12.4	13.7	1.0	11.1	1	86	18.2	0.081
1.5SMC15H	DWJ	13.5	16.5	1.0	12.1	1	71	22.0	0.084
1.5SMC15AH	DXJ	14.3	15.8	1.0	12.8	1	74	21.2	0.084
1.5SMC16H	DYJ	14.4	17.6	1.0	12.9	1	67	23.5	0.086
1.5SMC16AH	DZJ	15.2	16.8	1.0	13.6	1	70	22.5	0.086
1.5SMC18H	EDJ	16.2	19.8	1.0	14.5	1	59	26.5	0.088
1.5SMC18AH	EEJ	17.1	18.9	1.0	15.3	1	60	25.5	0.088
1.5SMC20H	EFJ	18.0	22.0	1.0	16.2	1	54	29.1	0.090
1.5SMC20AH	EGJ	19.0	21.0	1.0	17.1	1	56	27.7	0.090
1.5SMC22H	EHJ	19.8	24.2	1.0	17.8	1	49	31.9	0.092
1.5SMC22AH	EKJ	20.9	23.1	1.0	18.8	1	51	30.6	0.092
1.5SMC24H	ELJ	21.6	26.4	1.0	19.4	1	45	34.7	0.094
1.5SMC24AH	EMJ	22.8	25.2	1.0	20.5	1	47	33.2	0.094
1.5SMC27H	ENJ	24.3	29.7	1.0	21.8	1	40	39.1	0.096
1.5SMC27AH	EPJ	25.7	28.4	1.0	23.1	1	42	37.5	0.096
1.5SMC30H	EQJ	27.0	33.0	1.0	24.3	1	36	43.5	0.097
1.5SMC30AH	ERJ	28.5	31.5	1.0	25.6	1	38	41.4	0.097
1.5SMC33H	ESJ	29.7	36.3	1.0	26.8	1	33	47.7	0.098
1.5SMC33AH	ETJ	31.4	34.7	1.0	28.2	1	34	45.7	0.098
1.5SMC36H	EUJ	32.4	39.6	1.0	29.1	1	30	52.0	0.099
1.5SMC36AH	EVJ	34.2	37.8	1.0	30.8	1	31	49.9	0.099
1.5SMC39H	EWJ	35.1	42.9	1.0	31.6	1	27	56.4	0.100
1.5SMC39AH	EXJ	37.1	41.0	1.0	33.3	1	29	53.9	0.100
1.5SMC43H	EYJ	38.7	47.3	1.0	34.8	1	25	61.9	0.101
1.5SMC43AH	EZJ	40.9	45.2	1.0	36.8	1	26	59.3	0.101
1.5SMC47H	FDJ	42.3	51.7	1.0	38.1	1	23	67.8	0.101
1.5SMC47AH	FEJ	44.7	49.4	1.0	40.2	1	24	64.8	0.101
1.5SMC51H	FFJ	45.9	56.1	1.0	41.3	1	21	73.5	0.102

## ELECTRICAL SPECIFICATIONS (T<sub>A</sub> = 25°C unless otherwise noted)

Part number	Marking code	Breakdown voltage (Note 1) V <sub>BR</sub> @I <sub>T</sub> (V)		Test current I <sub>T</sub> (mA)	Working stand-off voltage V <sub>WM</sub> (V)	Maximum blocking leakage current I <sub>R</sub> @V <sub>WM</sub> (μA)	Maximum peak impulse current (Note 2) I <sub>PPM</sub> (A)	Maximum clamping voltage V <sub>C</sub> @I <sub>PPM</sub> (V)	Maximum Temperature Coefficient of V <sub>BR</sub> (%/°C)
		Min	Max						
1.5SMC51AH	FGJ	48.5	53.6	1.0	43.6	1	22	70.1	0.102
1.5SMC56H	FHJ	50.4	61.6	1.0	45.4	1	19	80.5	0.103
1.5SMC56AH	FKJ	53.2	58.8	1.0	47.8	1	20	77.0	0.103
1.5SMC62H	FLJ	55.8	68.2	1.0	50.2	1	17	89.0	0.104
1.5SMC62AH	FMJ	58.9	65.1	1.0	53.0	1	18	85.0	0.104
1.5SMC68H	FNJ	61.2	74.8	1.0	55.1	1	16	98.0	0.104
1.5SMC68AH	FPJ	64.6	71.4	1.0	58.1	1	17	92.0	0.104
1.5SMC75H	FQJ	67.5	82.5	1.0	60.7	1	14	108	0.105
1.5SMC75AH	FRJ	71.3	78.8	1.0	64.1	1	15	103	0.105
1.5SMC82H	FSJ	73.8	90.2	1.0	66.4	1	13	118	0.105
1.5SMC82AH	FTJ	77.9	86.1	1.0	70.1	1	13.9	113	0.105
1.5SMC91H	FUJ	81.9	100	1.0	73.7	1	12	131	0.106
1.5SMC91AH	FVJ	86.5	95.5	1.0	77.8	1	12.6	125	0.106
1.5SMC100H	FWJ	90	110	1.0	81.0	1	10.9	144	0.106
1.5SMC100AH	FXJ	95	105	1.0	85.5	1	11.4	137	0.106
1.5SMC110H	FYJ	99	121	1.0	89.2	1	9.9	158	0.107
1.5SMC110AH	FZJ	105	116	1.0	94.0	1	10.3	152	0.107
1.5SMC120H	GDJ	108	132	1.0	97.2	1	9.1	173	0.107
1.5SMC120AH	GEJ	114	126	1.0	102.0	1	9.5	165	0.107
1.5SMC130H	GFJ	117	143	1.0	105.0	1	8.4	187	0.107
1.5SMC130AH	GGJ	124	137	1.0	111.0	1	8.7	179	0.107
1.5SMC150H	GHJ	135	165	1.0	121.0	1	7.3	215	0.108
1.5SMC150AH	GKJ	143	158	1.0	128.0	1	7.6	207	0.108
1.5SMC160H	GLJ	144	176	1.0	130.0	1	6.8	230	0.108
1.5SMC160AH	GMJ	152	168	1.0	136.0	1	7.1	219	0.108
1.5SMC170H	GNJ	153	187	1.0	138.0	1	6.4	244	0.108
1.5SMC170AH	GPJ	162	179	1.0	145.0	1	6.7	234	0.108
1.5SMC180H	GQJ	162	198	1.0	146.0	1	6.1	258	0.108
1.5SMC180AH	GRJ	171	189	1.0	154.0	1	6.4	246	0.108
1.5SMC200H	GSJ	180	220	1.0	162.0	1	5.4	287	0.108
1.5SMC200AH	GTJ	190	210	1.0	171.0	1	5.7	274	0.108

### Notes:

1. V<sub>BR</sub> measure after I<sub>T</sub> applied for 30ms, I<sub>T</sub>=square wave pulse or equivalent
2. Surge current waveform per Fig.5 and derate per Fig.2
3. For bipolar types having V<sub>WM</sub> of 10V and under, the I<sub>R</sub> limit is doubled
4. For bidirectional use CH or CAH suffix for types 1.5SMC6.8H - 1.5SMC200AH
5. All terms and symbols are consistent with ANSI/IEEE C62.35

## ORDERING INFORMATION

ORDERING CODE <sup>(1)</sup>	PACKAGE	PACKING
1.5SMCxH	DO-214AB (SMC)	3,000 / Tape & Reel

### Notes:

1. "x" defines voltage from 6.8V(1.5SMC6.8H) to 200V(1.5SMC200H)

**CHARACTERISTICS CURVES**

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

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



**Fig.2 Pulse Derating Curve**



**Fig.3 Typical Junction Capacitance**



**Fig.4 Maximum Non-repetitive Forward Surge Current**



**CHARACTERISTICS CURVES**

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

**Fig.5 Clamping Power Pulse Waveform**



**PACKAGE OUTLINE DIMENSIONS**

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**



Cathode band for uni-directional products only

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