

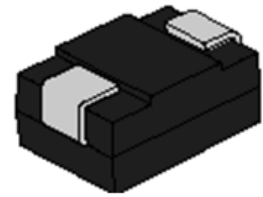


## 1.5SMC Series 1500W Transient Voltage Suppressor

Rev.4.3

### DESCRIPTION:

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.



SMC

### FEATURES:

- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ 1500W peak pulse power capability at 10/1000μs waveform.
- ✧ Typical  $I_R$  less than 1μA above 12V.
- ✧ Fast response time: typically less than 1.0ps from 0V to  $V_{BR}$  min.
- ✧ High temperature to reflow soldering: 260°C/40s at terminals.
- ✧ Plastic package has under writers laboratory flammability 94V-0.
- ✧ Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C.
- ✧ Terminal: solder plated, solderable per J-STD-002.
- ✧ For surface mounted applications in order to optimize board space.



Bi-directional



Uni-directional

Symbol

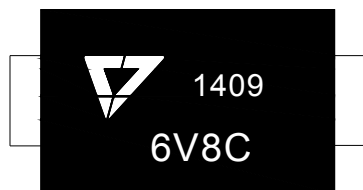
### ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ , RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage and operating junction temperature range	$T_{STG}/T_J$	-55 to +150	°C
Peak pulse power dissipation at 10/1000μs waveform	$P_{PP}$	1500	W
Steady state power dissipation at $T_L=75^\circ\text{C}$	$P_{M(AV)}$	6.5	W
Maximum instantaneous forward voltage at 100A for unidirectional only	$V_F$	5.0	V
Peak forward surge current, 8.3ms single half sine wave(Note 1)	$I_{FSM}$	200	A
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	°C/W

### Notes:

1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum

## MARKING



6V8C: Device Marking Code  
1409: In ninth week, 2014

ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

Part Number		Marking		V <sub>R</sub>	I <sub>R</sub> @ V <sub>R</sub>	V <sub>BR</sub> @I <sub>T</sub>		I <sub>T</sub>	V <sub>C</sub> @ I <sub>PP</sub>	I <sub>PP</sub> <sup>①</sup>
Uni-polar	Bi-polar	Uni	Bi	V	μA	min(V)	max(V)	mA	V	A
1.5SMC6.8A	1.5SMC6.8CA	6V8A	6V8C	5.8	300	6.45	7.14	10	10.5	144.8
1.5SMC7.5A	1.5SMC7.5CA	7V5A	7V5C	6.4	150	7.13	7.88	10	11.3	132.8
1.5SMC8.2A	1.5SMC8.2CA	8V2A	8V2C	7.02	100	7.79	8.61	10	12.1	124.0
1.5SMC9.1A	1.5SMC9.1CA	9V1A	9V1C	7.78	50	8.65	9.55	1	13.4	112.0
1.5SMC10A	1.5SMC10CA	10A	10C	8.55	10	9.50	10.50	1	14.5	103.5
1.5SMC11A	1.5SMC11CA	11A	11C	9.4	5	10.50	11.60	1	15.6	96.2
1.5SMC12A	1.5SMC12CA	12A	12C	10.2	5	11.40	12.60	1	16.7	89.8
1.5SMC13A	1.5SMC13CA	13A	13C	11.1	1	12.40	13.70	1	18.2	82.5
1.5SMC15A	1.5SMC15CA	15A	15C	12.8	1	14.30	15.80	1	21.2	70.8
1.5SMC16A	1.5SMC16CA	16A	16C	13.6	1	15.20	16.80	1	22.5	66.7
1.5SMC18A	1.5SMC18CA	18A	18C	15.3	1	17.10	18.90	1	25.2	59.6
1.5SMC20A	1.5SMC20CA	20A	20C	17.1	1	19.00	21.00	1	27.7	54.2
1.5SMC22A	1.5SMC22CA	22A	22C	18.8	1	20.90	23.10	1	30.6	49.1
1.5SMC24A	1.5SMC24CA	24A	24C	20.5	1	22.80	25.20	1	33.2	45.2
1.5SMC27A	1.5SMC27CA	27A	27C	23.1	1	25.70	28.40	1	37.5	40.0
1.5SMC30A	1.5SMC30CA	30A	30C	25.6	1	28.50	31.50	1	41.4	36.3
1.5SMC33A	1.5SMC33CA	33A	33C	28.2	1	31.40	34.70	1	45.7	32.9
1.5SMC36A	1.5SMC36CA	36A	36C	30.8	1	34.20	37.80	1	49.9	30.1
1.5SMC39A	1.5SMC39CA	39A	39C	33.3	1	37.10	41.00	1	53.9	27.9
1.5SMC43A	1.5SMC43CA	43A	43C	36.8	1	40.90	45.20	1	59.3	25.3
1.5SMC47A	1.5SMC47CA	47A	47C	40.2	1	44.70	49.40	1	64.8	23.2
1.5SMC51A	1.5SMC51CA	51A	51C	43.6	1	48.50	53.60	1	70.1	21.4

ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, continued)

Part Number		Marking		V <sub>R</sub>	I <sub>R</sub> @ V <sub>R</sub>	V <sub>BR</sub> @I <sub>T</sub>		I <sub>T</sub>	V <sub>C</sub> @ I <sub>PP</sub>	I <sub>PP</sub> <sup>①</sup>
Uni-polar	Bi-polar	Uni	Bi	V	μA	min(V)	max(V)	mA	V	A
1.5SMC56A	1.5SMC56CA	56A	56C	47.8	1	53.20	58.80	1	77.0	19.5
1.5SMC62A	1.5SMC62CA	62A	62C	53.0	1	58.90	65.10	1	85.0	17.7
1.5SMC68A	1.5SMC68CA	68A	68C	58.1	1	64.60	71.40	1	92.0	16.4
1.5SMC70A	1.5SMC70CA	70A	70C	59.9	1	66.50	73.50	1	100.0	15.0
1.5SMC75A	1.5SMC75CA	75A	75C	64.1	1	71.30	78.80	1	103.0	14.6
1.5SMC82A	1.5SMC82CA	82A	82C	70.1	1	77.90	86.10	1	113.0	13.3
1.5SMC91A	1.5SMC91CA	91A	91C	77.8	1	86.50	95.50	1	125.0	12.0
1.5SMC100A	1.5SMC100CA	100A	100C	85.5	1	95.00	105.0	1	137.0	11.0
1.5SMC110A	1.5SMC110CA	110A	110C	94.0	1	105.0	116.0	1	152.0	10.0
1.5SMC120A	1.5SMC120CA	120A	120C	102	1	114.0	126.0	1	165.0	9.1
1.5SMC130A	1.5SMC130CA	130A	130C	111	1	124.0	137.0	1	179.0	8.4
1.5SMC150A	1.5SMC150CA	150A	150C	128	1	143.0	158.0	1	207.0	7.3
1.5SMC160A	1.5SMC160CA	160A	160C	136	1	152.0	168.0	1	219.0	6.9
1.5SMC170A	1.5SMC170CA	170A	170C	145	1	162.0	179.0	1	234.0	6.5
1.5SMC180A	1.5SMC180CA	180A	180C	154	1	171.0	189.0	1	246.0	6.1
1.5SMC200A	1.5SMC200CA	200A	200C	171	1	190.0	210.0	1	274.0	5.5
1.5SMC220A	1.5SMC220CA	220A	220C	185	1	209.0	231.0	1	328.0	4.6
1.5SMC250A	1.5SMC250CA	250A	250C	214	1	237.0	263.0	1	344.0	4.4
1.5SMC300A	1.5SMC300CA	300A	300C	256	1	285.0	315.0	1	414.0	3.7
1.5SMC350A	1.5SMC350CA	350A	350C	300	1	332.0	368.0	1	482.0	3.2
1.5SMC400A	1.5SMC400CA	400A	400C	342	1	380.0	420.0	1	548.0	2.8
1.5SMC440A	1.5SMC440CA	440A	440C	376	1	418.0	462.0	1	602.0	2.5

① Surge waveform:10/1000μs

V<sub>R</sub>: Stand-off voltage -- Maximum voltage that can be appliedV<sub>BR</sub>: Breakdown voltageV<sub>C</sub>: Clamping voltage -- Peak voltage measured across the suppressor at a specified I<sub>PP</sub>I<sub>R</sub>: Reverse leakage current

ORDERING INFORMATION

<p><b>1.5SMC</b></p> <p>1500W SMC Series</p>	<p><b>XX</b></p> <p><math>V_{BR}</math> Voltage</p>	<p><b>C</b></p> <p>C: Bi-directional</p>	<p><b>A</b></p> <p>5% <math>V_{BR}</math> Voltage tolerance</p>
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RATINGS AND V-I CHARACTERISTICS CURVES ( $T_A=25^{\circ}C$ , unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

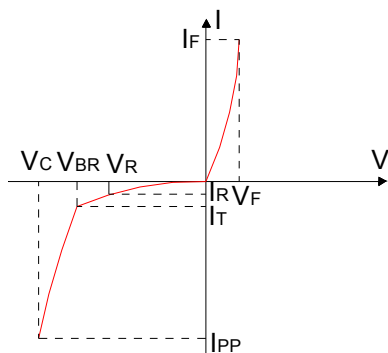


FIG.2:V- I curve characteristics (Bi-directional)

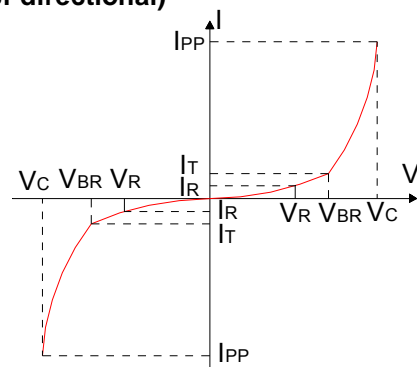


FIG.3: Pulse waveform

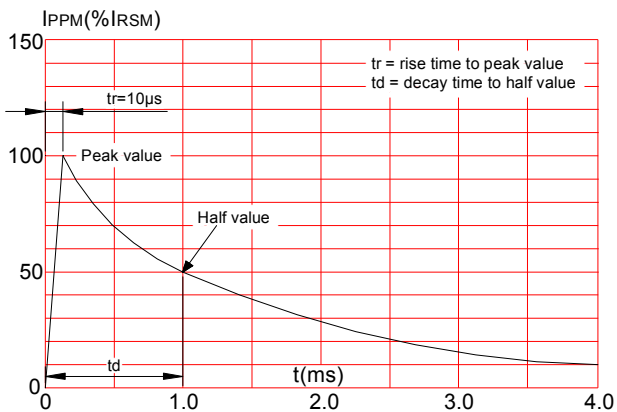


FIG.4: Pulse derating curve

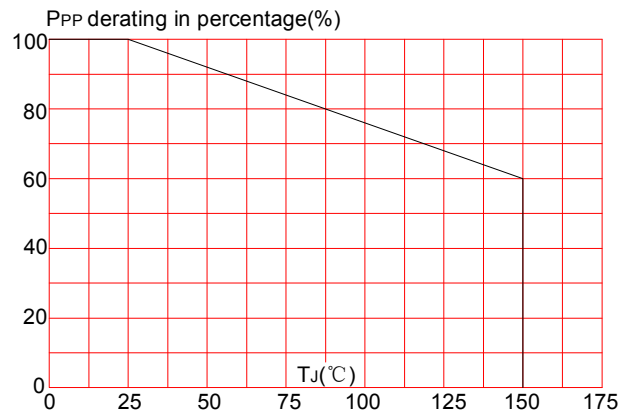
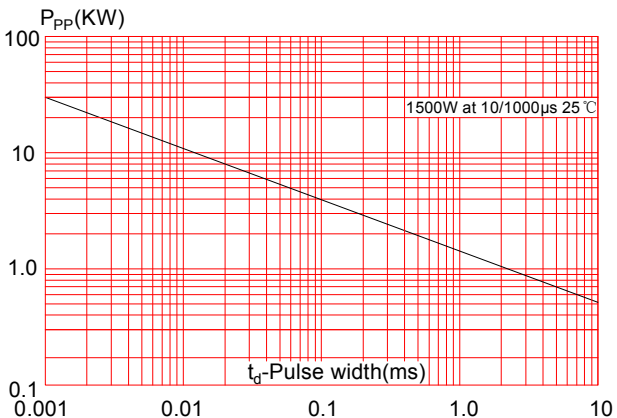
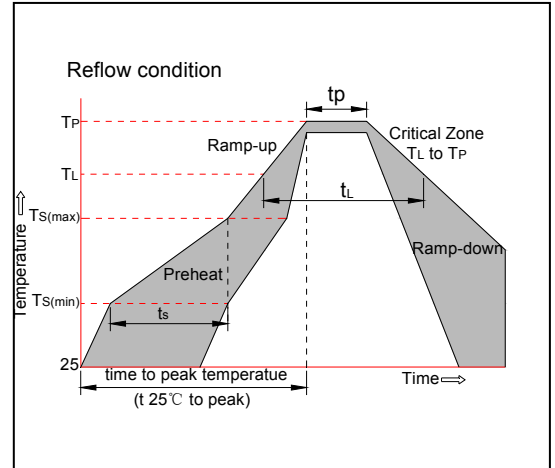


FIG.5:Peak pulse power dissipation vs. pulse width

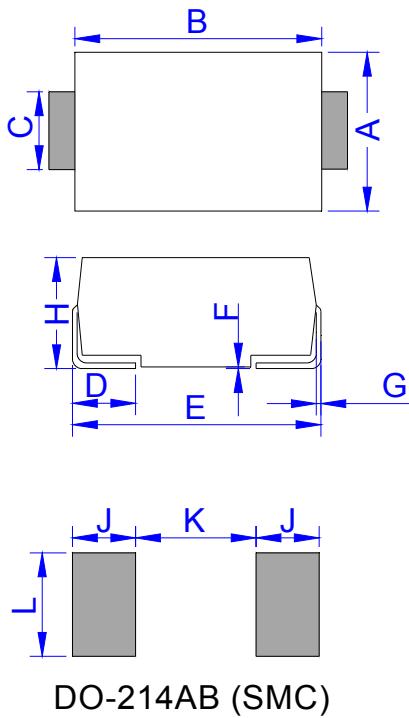


**SOLDERING PARAMETERS**

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp ( $T_L$ )to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ )(Liquidus)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_P$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_P$ )		8 min. Max
Do not exceed		+260°C

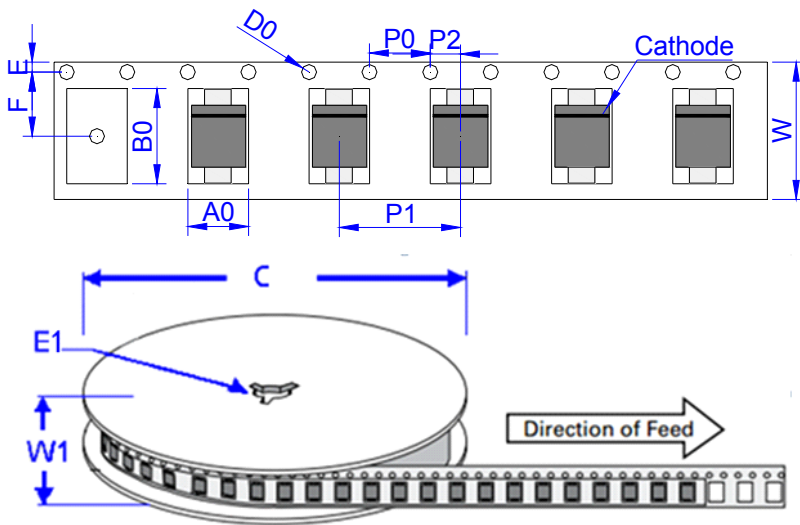


**PACKAGE MECHANICAL DATA**



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	5.75	6.25	0.226	0.246
B	6.90	7.40	0.272	0.291
C	2.75	3.25	0.108	0.128
D	0.95	1.52	0.037	0.060
E	7.70	8.20	0.303	0.323
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.15	2.62	0.085	0.103
J	2.40		0.094	
K		4.20		0.165
L	3.30		0.130	

TAPE AND REEL SPECIFICATION-SMC



Ref.	Dimensions	
	Millimeters	Inches
A0	6.05 ± 0.3	0.238 ± 0.012
B0	8.31 ± 0.3	0.327 ± 0.012
C	330.0	13.0
D0	1.55 ± 0.1	0.061 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3 ± 0.3	0.524 ± 0.012
F	7.50 ± 0.2	0.295 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	8.00 ± 0.2	0.3145 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	16.0 ± 0.2	0.630 ± 0.008
W1	19.7 ± 2.0	0.776 ± 0.079

PART No.	UNIT WEIGHT (g/PCS) typ.	REEL (PCS)	PER CARTON (PCS)	DESCRIPTION
1.5SMCxxA/CA	0.256	3,000	48,000	13 inch reel pack

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