

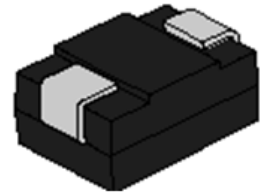


## SMCJxx(C)A-AU Series 1500W Transient Voltage Suppressor

Rev.1.0

### DESCRIPTION

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



SMC



Bi-directional



Uni-directional

Symbol

### 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 11V.
- ✧ 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 underwriters 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.
- ✧ IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact).
- ✧ UL 497B item recognized. (File No.:E480698).
- ✧ For surface mounted applications in order to optimize board space.
- ✧ High reliability application and automotive grade (AEC-Q101 qualified).

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

Parameter	Symbol	Value	Unit
Operating junction and storage temperature range	$T_{STG}/T_J$	-55 to +150	°C
Steady state power dissipation at $T_L=75^\circ\text{C}$	$P_{M(AV)}$	6.5	W
Peak pulse power dissipation at 10/1000μs waveform	$P_{PP}$	1500	W
Maximum instantaneous forward voltage at 100A for unidirectional	$V_F$	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



BDX: 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@V<sub>R</sub></sub>	V <sub>BR@I<sub>T</sub></sub>		I <sub>T</sub>	V <sub>C@I<sub>PP</sub></sub>	I <sub>PP</sub> <sup>®</sup>
Uni-Polar	Bi-Polar	Uni	Bi	V	max(μA)	min(V)	max(V)	mA	max(V)	A
SMCJ10A-AU	SMCJ10CA-AU	GDX	BDX	10.0	5	11.10	12.30	1	17.0	88.2
SMCJ11A-AU	SMCJ11CA-AU	GDZ	BDZ	11.0	2	12.20	13.50	1	18.2	82.4
SMCJ12A-AU	SMCJ12CA-AU	GEE	BEE	12.0	1	13.30	14.70	1	19.9	75.4
SMCJ13A-AU	SMCJ13CA-AU	GEG	BEG	13.0	1	14.40	15.90	1	21.5	69.8
SMCJ14A-AU	SMCJ14CA-AU	GEK	BEK	14.0	1	15.60	17.20	1	23.2	64.7
SMCJ15A-AU	SMCJ15CA-AU	GEM	BEM	15.0	1	16.70	18.50	1	24.4	61.5
SMCJ16A-AU	SMCJ16CA-AU	GEP	BEP	16.0	1	17.80	19.70	1	26.0	57.7
SMCJ17A-AU	SMCJ17CA-AU	GER	BER	17.0	1	18.90	20.90	1	27.6	54.4
SMCJ18A-AU	SMCJ18CA-AU	GET	BET	18.0	1	20.00	22.10	1	29.2	51.4
SMCJ20A-AU	SMCJ20CA-AU	GEV	BEV	20.0	1	22.20	24.50	1	32.4	46.3
SMCJ22A-AU	SMCJ22CA-AU	GEX	BEX	22.0	1	24.40	26.90	1	35.5	42.3
SMCJ24A-AU	SMCJ24CA-AU	GEZ	BEZ	24.0	1	26.70	29.50	1	38.9	38.6
SMCJ26A-AU	SMCJ26CA-AU	GFE	BFE	26.0	1	28.90	31.90	1	42.1	35.6
SMCJ28A-AU	SMCJ28CA-AU	GFG	BFG	28.0	1	31.10	34.40	1	45.4	33.1
SMCJ30A-AU	SMCJ30CA-AU	GFK	BFK	30.0	1	33.30	36.80	1	48.4	31.0
SMCJ33A-AU	SMCJ33CA-AU	GFM	BFM	33.0	1	36.70	40.60	1	53.3	28.2
SMCJ36A-AU	SMCJ36CA-AU	GFP	BFP	36.0	1	40.00	44.20	1	58.1	25.8
SMCJ40A-AU	SMCJ40CA-AU	GFR	BFR	40.0	1	44.40	49.10	1	64.5	23.3
SMCJ43A-AU	SMCJ43CA-AU	GFT	BFT	43.0	1	47.80	52.80	1	69.4	21.6
SMCJ45A-AU	SMCJ45CA-AU	GFV	BFV	45.0	1	50.00	55.30	1	72.7	20.6
SMCJ48A-AU	SMCJ48CA-AU	GFX	BFX	48.0	1	53.30	58.90	1	77.4	19.4
SMCJ51A-AU	SMCJ51CA-AU	GFZ	BFZ	51.0	1	56.70	62.70	1	82.4	18.2
SMCJ54A-AU	SMCJ54CA-AU	GGE	BGE	54.0	1	60.00	66.30	1	87.1	17.2
SMCJ58A-AU	SMCJ58CA-AU	GGG	BGG	58.0	1	64.40	71.20	1	93.6	16.1

## 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	max(μA)	min(V)	max(V)	mA	max(V)	A
SMCJ60A-AU	SMCJ60CA-AU	GGK	BGK	60.0	1	66.70	73.70	1	96.8	15.5
SMCJ64A-AU	SMCJ64CA-AU	GGM	BGM	64.0	1	71.10	78.60	1	103.0	14.6
SMCJ70A-AU	SMCJ70CA-AU	GGP	BGP	70.0	1	77.80	86.00	1	113.0	13.3
SMCJ75A-AU	SMCJ75CA-AU	GGR	BGR	75.0	1	83.30	92.10	1	121.0	12.4
SMCJ78A-AU	SMCJ78CA-AU	GGT	BGT	78.0	1	86.70	95.80	1	126.0	11.9
SMCJ85A-AU	SMCJ85CA-AU	GGV	BGV	85.0	1	94.40	104.0	1	137.0	11.0
SMCJ90A-AU	SMCJ90CA-AU	GGX	BGX	90.0	1	100.0	111.0	1	146.0	10.3
SMCJ100A-AU	SMCJ100CA-AU	GGZ	BGZ	100.0	1	111.0	123.0	1	162.0	9.3
SMCJ110A-AU	SMCJ110CA-AU	GHE	BHE	110.0	1	122.0	135.0	1	177.0	8.5
SMCJ120A-AU	SMCJ120CA-AU	GHG	BHG	120.0	1	133.0	147.0	1	193.0	7.8
SMCJ130A-AU	SMCJ130CA-AU	GHK	BHK	130.0	1	144.0	159.0	1	209.0	7.2
SMCJ150A-AU	SMCJ150CA-AU	GHM	BHM	150.0	1	167.0	185.0	1	243.0	6.2
SMCJ160A-AU	SMCJ160CA-AU	GHP	BHP	160.0	1	178.0	197.0	1	259.0	5.8
SMCJ170A-AU	SMCJ170CA-AU	GHR	BHR	170.0	1	189.0	209.0	1	275.0	5.5
SMCJ180A-AU	SMCJ180CA-AU	GHT	BHT	180.0	1	201.0	222.0	1	292.0	5.2
SMCJ190A-AU	SMCJ190CA-AU	GHU	BHU	190.0	1	211.0	234.0	1	307.0	4.9
SMCJ200A-AU	SMCJ200CA-AU	GHV	BHV	200.0	1	224.0	247.0	1	324.0	4.7
SMCJ210A-AU	SMCJ210CA-AU	GHW	BHW	210.0	1	233.0	258.0	1	337.0	4.5
SMCJ220A-AU	SMCJ220CA-AU	GHX	BHX	220.0	1	246.0	272.0	1	356.0	4.2
SMCJ250A-AU	SMCJ250CA-AU	GJG	BJG	250.0	1	279.0	309.0	1	405.0	3.7
SMCJ300A-AU	SMCJ300CA-AU	GJK	BJK	300.0	1	335.0	371.0	1	486.0	3.1
SMCJ350A-AU	SMCJ350CA-AU	GJM	BJM	350.0	1	391.0	432.0	1	567.0	2.7
SMCJ400A-AU	SMCJ400CA-AU	GJP	BJP	400.0	1	447.0	494.0	1	648.0	2.3
SMCJ440A-AU	SMCJ440CA-AU	GJR	BJR	440.0	1	492.0	543.0	1	713.0	2.1

① Surge waveform: 10/1000μs

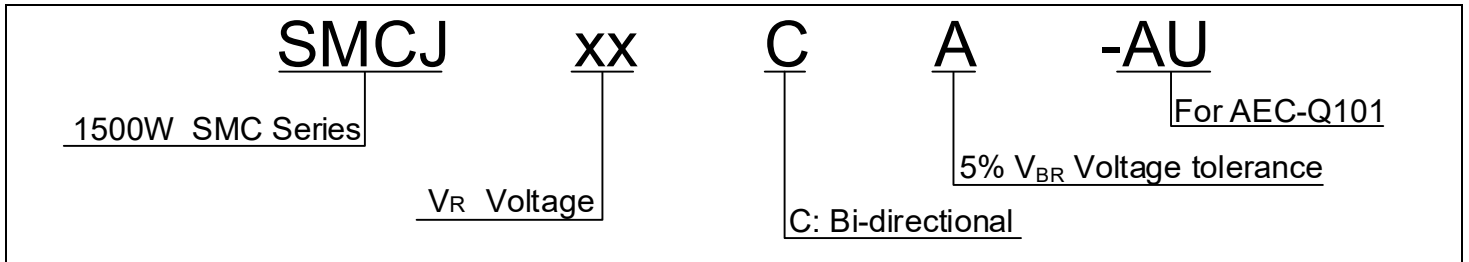
V<sub>R</sub>: Stand-off voltage -- maximum voltage that can be applied

V<sub>BR</sub>: Breakdown voltage

V<sub>C</sub>: Clamping voltage -- peak voltage measured across the suppressor at a specified I<sub>PP</sub>

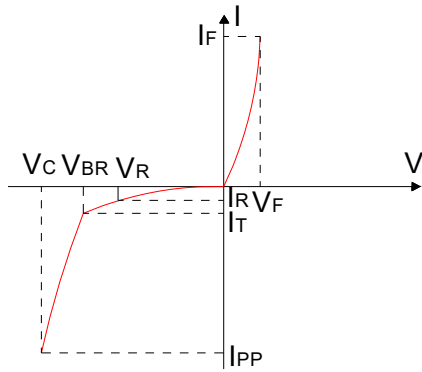
I<sub>R</sub>: Reverse leakage current

## ORDERING INFORMATION

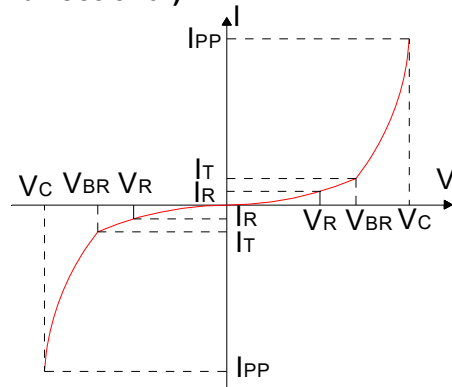


## RATINGS AND V-I CHARACTERISTICS CURVES ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

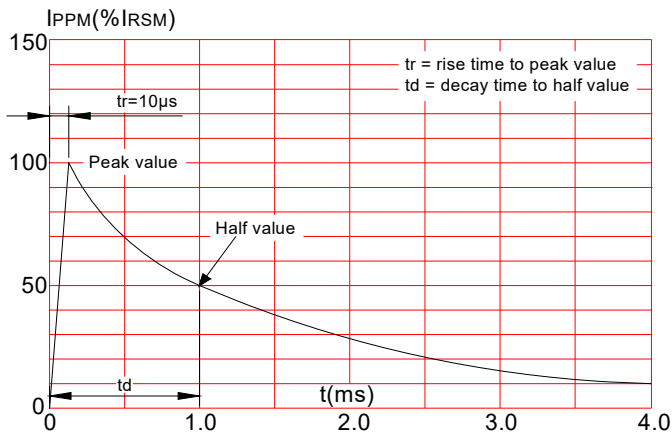
**FIG.1:V- I curve characteristics (Uni-directional)**



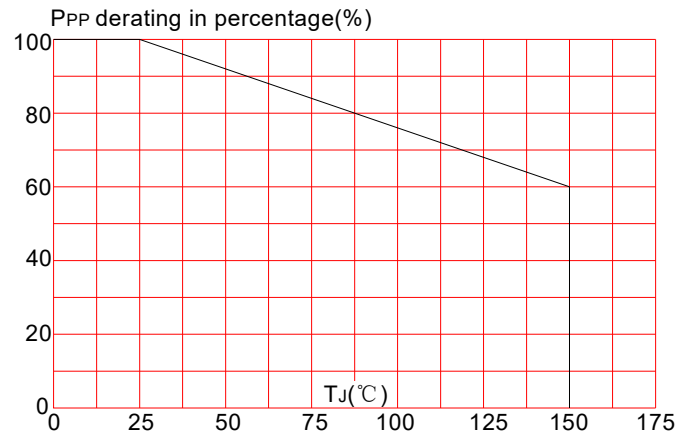
**FIG.2:V- I curve characteristics (Bi-directional)**



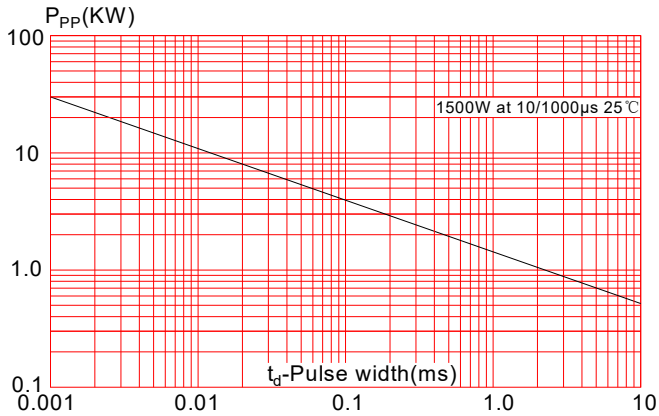
**FIG.3: Pulse waveform**



**FIG.4: Pulse derating curve**

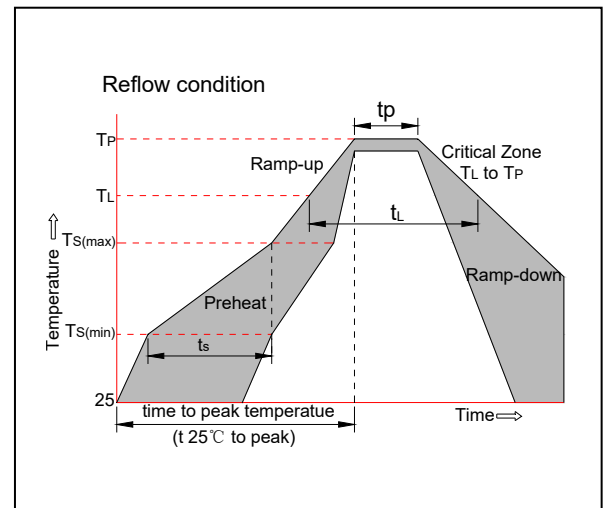


**FIG.5: Peak pulse power dissipation vs. pulse width**

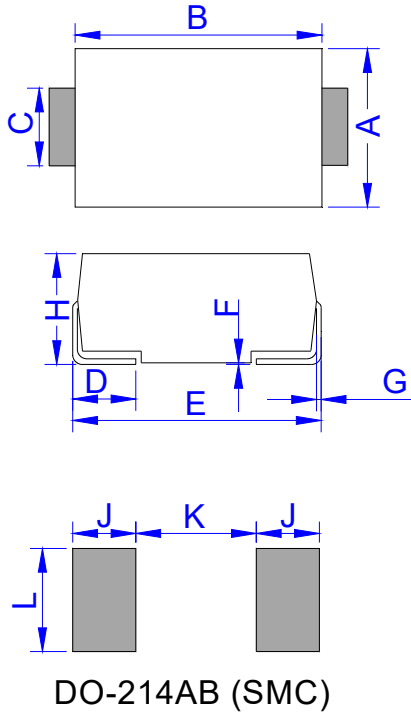


## SOLDERING PARAMETERS

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) ( $t_s$ )	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

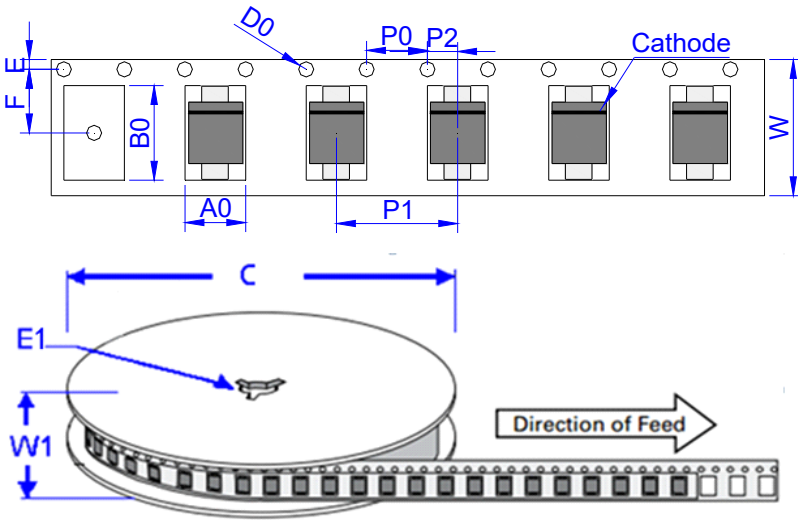


PACKAGE MECHANICAL DATA



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
SMCJxxA/CA-AU	0.262	3,000	48,000	13 inch reel pack

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