

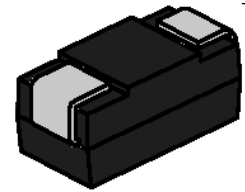


## SMDJ Series 3000W Transient Voltage Suppressor

Rev.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



Bi-directional



Uni-direction

Symbol

### FEATURES:

- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ 3000W peak pulse power capability at 10×1000μs waveform.
- ✧ Typical I<sub>R</sub> less than 1μA above 10V.
- ✧ Fast response time: typically less than 1.0ps from 0V to V<sub>BR</sub> 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-STD020, LF maximum peak of 260°C.
- ✧ For surface mounted applications in order to optimize board space.

### ABSOLUTE MAXIMUM RATINGS(T<sub>A</sub>=25°C, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage and operating junction temperature range	T <sub>STG</sub> / T <sub>J</sub>	-55 to +150	°C
Steady state power dissipation at T <sub>L</sub> =75°C	P <sub>M(AV)</sub>	6.5	W
Peak pulse power dissipation on 10/1000μs waveform	P <sub>PP</sub>	3000	W
Maximum instantaneous forward voltage at 100A for unidirectional only	V <sub>F</sub>	5.0	V
Peak forward surge current, 8.3ms single half sine wave (Note 1)	I <sub>FSM</sub>	300	A
Typical thermal resistance junction to lead	R <sub>θJL</sub>	15	°C/W
Typical thermal resistance junction to ambient	R <sub>θJA</sub>	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



IDE: Device Marking Code  
1409: In ninth week, 2014

ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ )

Part Number		Marking		$V_R$	$I_R@V_R$	$V_{BR}@I_T$		$I_T$	$V_C@I_{PP}$	$I_{PP}^{\text{①}}$
Uni-Polar	Bi-Polar	Uni	Bi	V	$\mu\text{A}$	min(V)	max(V)	mA	max(V)	A
SMDJ5.0A	SMDJ5.0CA	HDE	IDE	5.0	800	6.40	7.00	10	9.2	326.1
SMDJ6.0A	SMDJ6.0CA	HDG	IDG	6.0	800	6.67	7.37	10	10.3	291.3
SMDJ6.5A	SMDJ6.5CA	HDK	IDK	6.5	500	7.22	7.98	10	11.2	267.9
SMDJ7.0A	SMDJ7.0CA	HDM	IDM	7.0	200	7.78	8.60	10	12.0	250.0
SMDJ7.5A	SMDJ7.5CA	HDP	IDP	7.5	100	8.33	9.21	1	12.9	232.6
SMDJ8.0A	SMDJ8.0CA	HDR	IDR	8.0	50	8.89	9.83	1	13.6	220.6
SMDJ8.5A	SMDJ8.5CA	HDT	IDT	8.5	20	9.44	10.40	1	14.4	208.3
SMDJ9.0A	SMDJ9.0CA	HDV	IDV	9.0	10	10.00	11.10	1	15.4	194.8
SMDJ10A	SMDJ10CA	HDX	IDX	10	5	11.10	12.30	1	17.0	176.5
SMDJ11A	SMDJ11CA	HDZ	IDZ	11	1	12.20	13.50	1	18.2	164.8
SMDJ12A	SMDJ12CA	HEE	IEE	12	1	13.30	14.70	1	19.9	150.8
SMDJ13A	SMDJ13CA	HEG	IEG	13	1	14.40	15.90	1	21.5	139.5
SMDJ14A	SMDJ14CA	HEK	IEK	14	1	15.60	17.20	1	23.2	129.3
SMDJ15A	SMDJ15CA	HEM	IEM	15	1	16.70	18.50	1	24.4	123.0
SMDJ16A	SMDJ16CA	HEP	IEP	16	1	17.80	19.70	1	26.0	115.4
SMDJ17A	SMDJ17CA	HER	IER	17	1	18.90	20.90	1	27.6	108.7
SMDJ18A	SMDJ18CA	HET	IET	18	1	20.00	22.10	1	29.2	102.7
SMDJ20A	SMDJ20CA	HEV	IEV	20	1	22.20	24.50	1	32.4	92.6
SMDJ22A	SMDJ22CA	HEX	IEX	22	1	24.40	26.90	1	35.5	84.5
SMDJ24A	SMDJ24CA	HEZ	IEZ	24	1	26.70	29.50	1	38.9	77.1
SMDJ26A	SMDJ26CA	HFE	IFE	26	1	28.90	31.90	1	42.1	71.3
SMDJ28A	SMDJ28CA	HFG	IFG	28	1	31.10	34.40	1	45.4	66.1
SMDJ30A	SMDJ30CA	HFK	IFK	30	1	33.30	36.80	1	48.4	62.0
SMDJ33A	SMDJ33CA	HFM	IFM	33	1	36.70	40.60	1	53.3	56.3

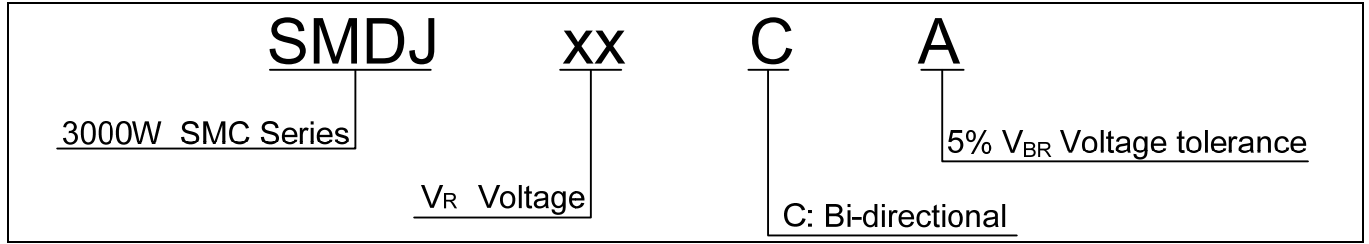
**ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$ , continued)

Part Number		Marking		$V_R$	$I_R@V_R$	$V_{BR}@I_T$		$I_T$	$V_C@I_{PP}$	$I_{PP}^{①}$
Uni-Polar	Bi-Polar	Uni	Bi	V	$\mu\text{A}$	min(V)	max(V)	mA	max(V)	A
SMDJ36A	SMDJ36CA	HFP	IFP	36	1	40.00	44.20	1	58.1	51.6
SMDJ40A	SMDJ40CA	HFR	IFR	40	1	44.40	49.10	1	64.5	46.5
SMDJ43A	SMDJ43CA	HFT	IFT	43	1	47.80	52.80	1	69.4	43.2
SMDJ45A	SMDJ45CA	HFV	IFV	45	1	50.00	55.30	1	72.7	41.3
SMDJ48A	SMDJ48CA	HFX	IFX	48	1	53.30	58.90	1	77.4	38.8
SMDJ51A	SMDJ51CA	HFZ	IFZ	51	1	56.70	62.70	1	82.4	36.4
SMDJ54A	SMDJ54CA	HGE	IGE	54	1	60.00	66.30	1	87.1	34.4
SMDJ58A	SMDJ58CA	HGG	IGG	58	1	64.40	71.20	1	93.6	32.1
SMDJ60A	SMDJ60CA	HGK	IGK	60	1	66.70	73.70	1	96.8	31.0
SMDJ64A	SMDJ64CA	HGM	IGM	64	1	71.10	78.60	1	103.0	29.1
SMDJ70A	SMDJ70CA	HGP	IGP	70	1	77.80	86.00	1	113.0	26.5
SMDJ75A	SMDJ75CA	HGR	IGR	75	1	83.30	92.10	1	121.0	24.8
SMDJ78A	SMDJ78CA	HGT	IGT	78	1	86.70	95.80	1	126.0	23.8
SMDJ85A	SMDJ85CA	HGV	IGV	85	1	94.40	104.0	1	137.0	21.9
SMDJ90A	SMDJ90CA	HGX	IGX	90	1	100.0	111.0	1	146.0	20.5
SMDJ100A	SMDJ100CA	HGZ	IGZ	100	1	111.0	123.0	1	162.0	18.5
SMDJ110A	SMDJ110CA	HHE	IHE	110	1	122.0	135.0	1	177.0	16.9
SMDJ120A	SMDJ120CA	HHG	IHG	120	1	133.0	147.0	1	193.0	15.5
SMDJ130A	SMDJ130CA	HHK	IHK	130	1	144.0	159.0	1	209.0	14.4
SMDJ150A	SMDJ150CA	HHM	IHM	150	1	167.0	185.0	1	243.0	12.3
SMDJ160A	SMDJ160CA	HHP	IHP	160	1	178.0	197.0	1	259.0	11.6
SMDJ170A	SMDJ170CA	HHR	IHR	170	1	189.0	209.0	1	275.0	10.9
SMDJ180A	SMDJ180CA	HHT	IHT	180	1	201.0	222.0	1	292.0	10.3
SMDJ190A	SMDJ190CA	HHV	IHV	190	1	211.0	234.0	1	307.0	9.7
SMDJ200A	SMDJ200CA	HHX	IHX	200	1	224.0	247.0	1	324.0	9.3
SMDJ210A	SMDJ210CA	HHZ	IHZ	210	1	233.0	258.0	1	337.0	8.8
SMDJ220A	SMDJ220CA	HIE	IIE	220	1	244.0	270.0	1	356.0	8.4

① Surge waveform:10/1000 $\mu\text{s}$  $V_R$ : Stand-off voltage -- Maximum voltage that can be applied $V_{BR}$ : Breakdown voltage $V_C$ : Clamping voltage -- Peak voltage measured across the suppressor at a specified  $I_{PP}$

$I_R$ : Reverse leakage current

ORDERING INFORMATION



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

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

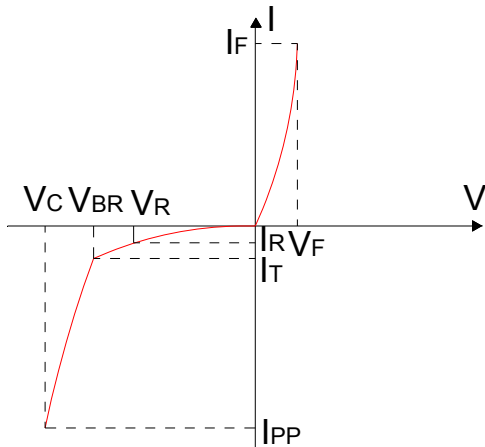


FIG.2: V- I curve characteristics (Bi-directional)

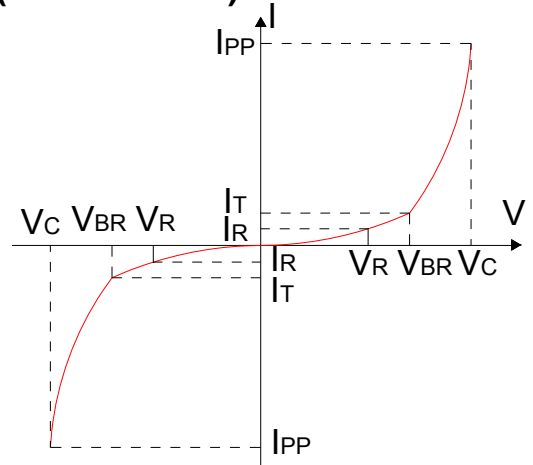


FIG.3: Pulse waveform

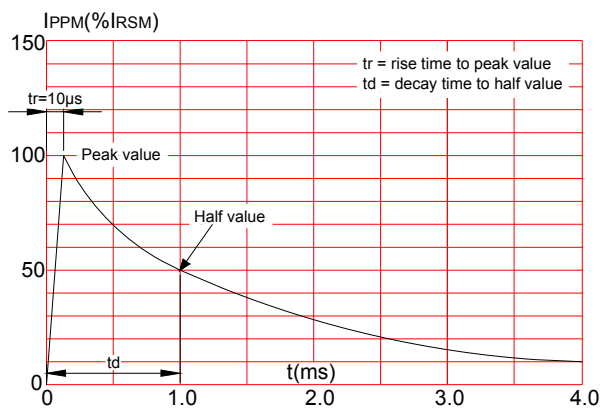
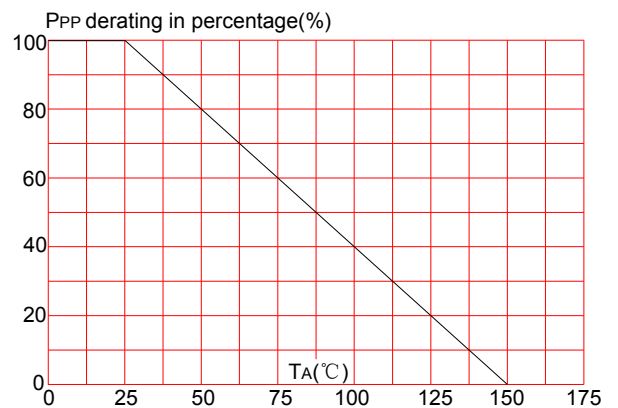
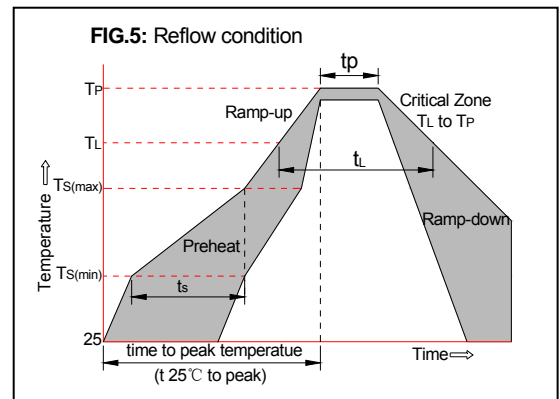


FIG.4: Pulse derating curve

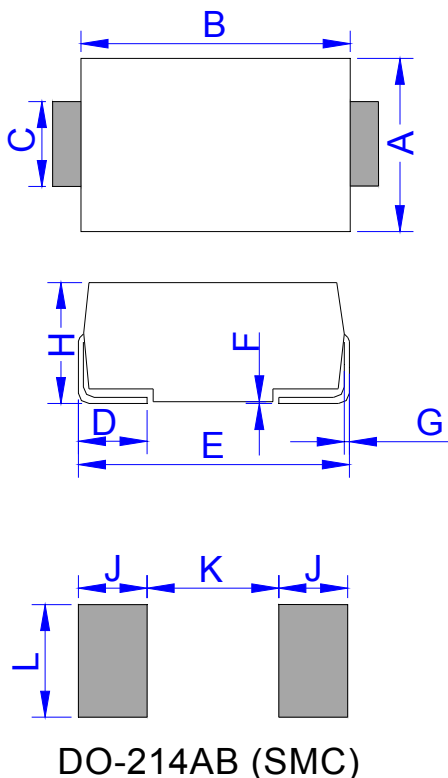


**SOLDERING PARAMETERS**

Reflow Condition		Pb-Free assembly (see FIG.5)
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. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_p$ )		8 min. Max
Do not exceed		+260°C

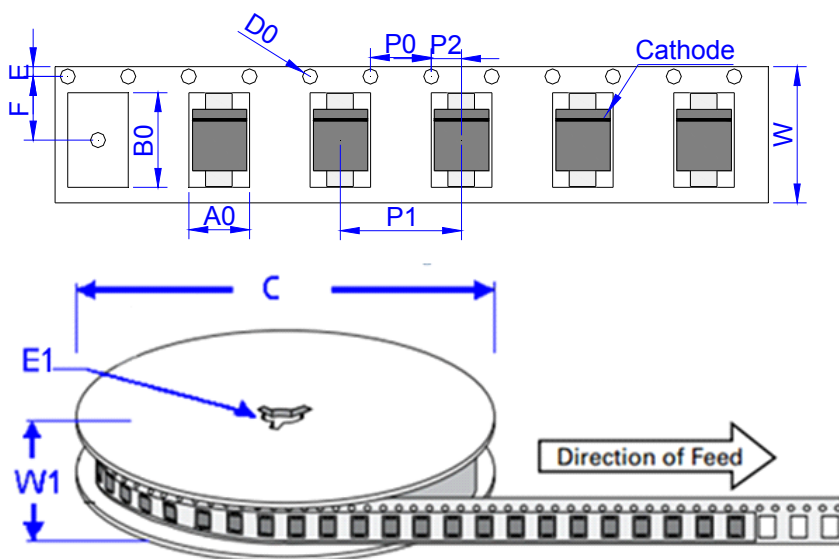


**PACKAGE MECHANICAL DATA**



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.	PACKAGE	QUANTITY	TAPE & REEL
SMDJxxA/CA	0.262	SMC(DO-214AB)	3,000	13inch

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