



## SMDJxxH Series 3000W Transient Voltage Suppressor

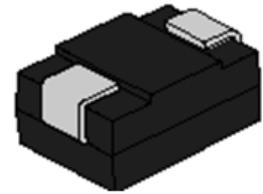
Rev.2.3

### 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.

### 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 5μA.
- ✧ 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 underwriters laboratory flammability 94V-0.
- ✧ Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C.
- ✧ For surface mounted applications in order to optimize board space.
- ✧ Terminal: solder plated, solderable per J-STD-002.
- ✧ IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact).
- ✧ High reliability application and automotive grade (AEC-Q101 qualified).



SMC



Bi-directional



Uni-directional

Symbol

### IEC COMPATIBILITY

- ✧ ISO16750-2 P5A 12V system (90V/4Ω/200ms 10c )
- ✧ ISO16750-2 P5A 24V system (151V/8Ω/200ms 10c)

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

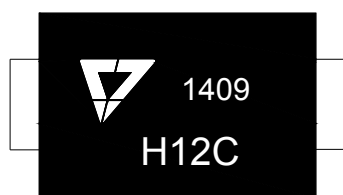
Parameter	Symbol	Value	Unit
Storage and operating junction temperature range	T <sub>STG</sub> / T <sub>J</sub>	-55 to +150	°C
Peak pulse power dissipation at 10/1000μs waveform	P <sub>PP</sub>	3000	W
Steady state power dissipation at T <sub>L</sub> =75°C	P <sub>M(AV)</sub>	6.5	W
Maximum instantaneous 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

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

Parameter	Symbol	Value	Unit
Typical thermal resistance junction to lead	$R_{\theta JL}$	15	$^{\circ}\text{C}/\text{W}$
Typical thermal resistance junction to ambient	$R_{\theta JA}$	75	$^{\circ}\text{C}/\text{W}$

**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**

H12C: 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	max( $\mu\text{A}$ )	min(V)	max(V)	mA	max(V)	A
SMDJ12AH	SMDJ12CAH	H12A	H12C	12	5	13.30	14.70	5	19.9	150.8
SMDJ13AH	SMDJ13CAH	H13A	H13C	13	5	14.40	15.90	5	21.5	139.5
SMDJ14AH	SMDJ14CAH	H14A	H14C	14	5	15.60	17.20	5	23.2	129.3
SMDJ15AH	SMDJ15CAH	H15A	H15C	15	5	16.70	18.50	5	24.4	123.0
SMDJ16AH	SMDJ16CAH	H16A	H16C	16	5	17.80	19.70	5	26.0	115.4
SMDJ17AH	SMDJ17CAH	H17A	H17C	17	5	18.90	20.90	5	27.6	108.7
SMDJ18AH	SMDJ18CAH	H18A	H18C	18	5	20.00	22.20	5	29.2	102.7
SMDJ20AH	SMDJ20CAH	H20A	H20C	20	5	22.20	24.50	5	32.4	92.6
SMDJ22AH	SMDJ22CAH	H22A	H22C	22	5	24.40	26.90	5	35.5	84.5
SMDJ24AH	SMDJ24CAH	H24A	H24C	24	5	26.70	29.50	5	38.9	77.1
SMDJ26AH	SMDJ26CAH	H26A	H26C	26	5	28.90	31.90	5	42.1	71.3
SMDJ28AH	SMDJ28CAH	H28A	H28C	28	5	31.10	34.40	5	45.4	66.1
SMDJ30AH	SMDJ30CAH	H30A	H30C	30	5	33.30	36.80	5	48.4	62.0
SMDJ33AH	SMDJ33CAH	H33A	H33C	33	5	36.70	40.60	5	53.3	56.3

## 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
SMDJ36AH	SMDJ36CAH	H36A	H36C	36	5	40.00	44.20	5	58.1	51.6
SMDJ40AH	SMDJ40CAH	H40A	H40C	40	5	44.40	49.10	5	64.5	46.5
SMDJ43AH	SMDJ43CAH	H43A	H43C	43	5	47.80	52.80	5	69.4	43.2
SMDJ45AH	SMDJ45CAH	H45A	H45C	45	5	50.00	55.30	5	72.7	41.3
SMDJ48AH	SMDJ48CAH	H48A	H48C	48	5	53.30	58.90	5	77.4	38.8
SMDJ51AH	SMDJ51CAH	H51A	H51C	51	5	56.70	62.70	5	82.4	36.4
SMDJ54AH	SMDJ54CAH	H54A	H54C	54	5	60.00	66.30	1	87.1	34.4
SMDJ58AH	SMDJ58CAH	H58A	H58C	58	5	64.40	71.20	1	93.6	32.1

① Surge waveform: 10/1000μs

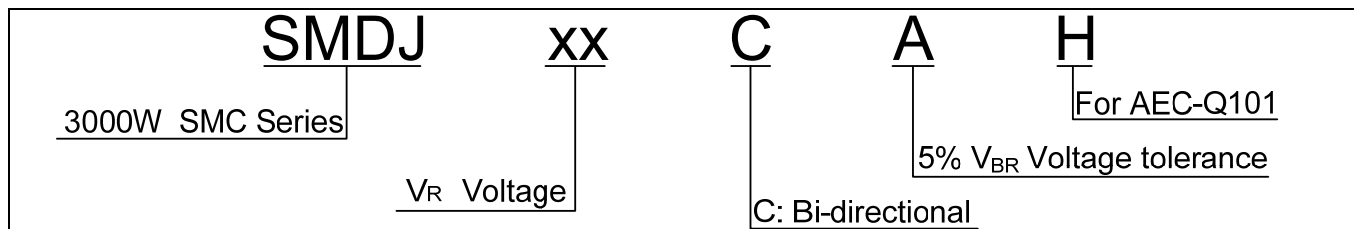
V<sub>R</sub>: Stand-off voltage -- Maximum voltage that can be applied

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<sub>A</sub>=25°C, unless otherwise noted)

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

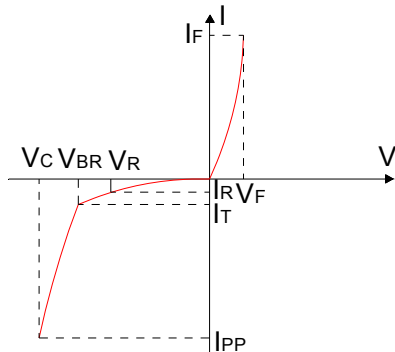


FIG.2:V- I curve characteristics (Bi-directional)

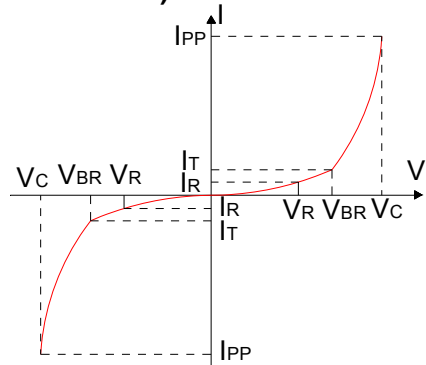


FIG.3: Pulse waveform

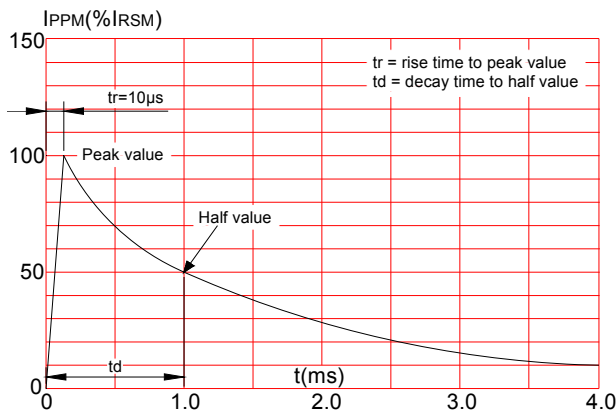


FIG.4: Pulse derating curve

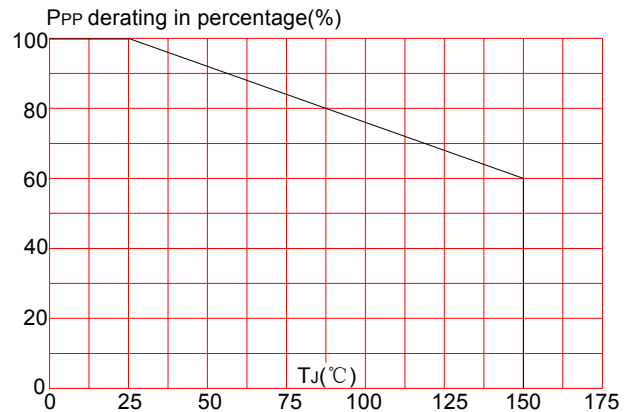


FIG.5: ISO16750 -2 test pulse 5A

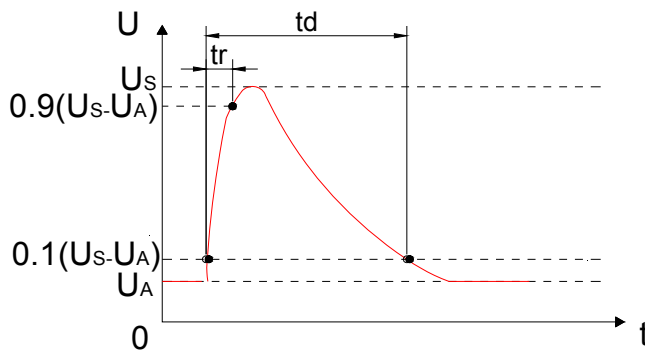
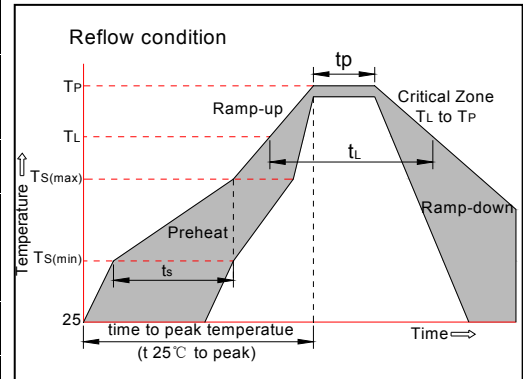


FIG.6: Parameters for test pulse 5a

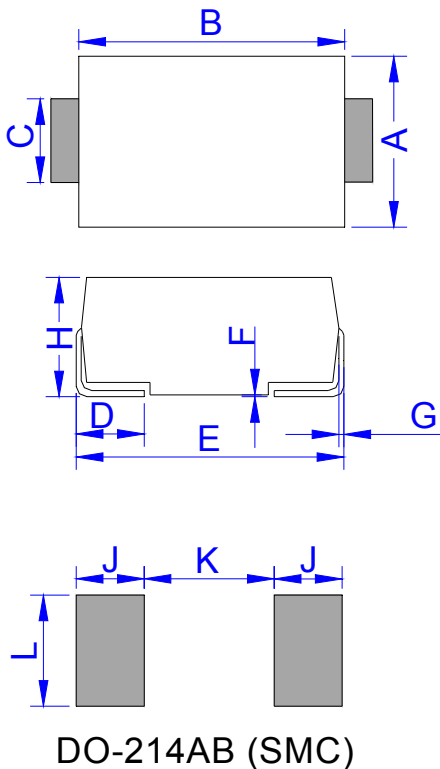
Parameter	12V system	24V system
U <sub>s</sub>	79V to 101V	151V to 202V
R <sub>i</sub>	0.5Ω to 4Ω	1 Ω to 8Ω
t <sub>d</sub>	40ms to 400ms	100ms to 350ms
t <sub>r</sub>	5-10ms	5-10ms

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

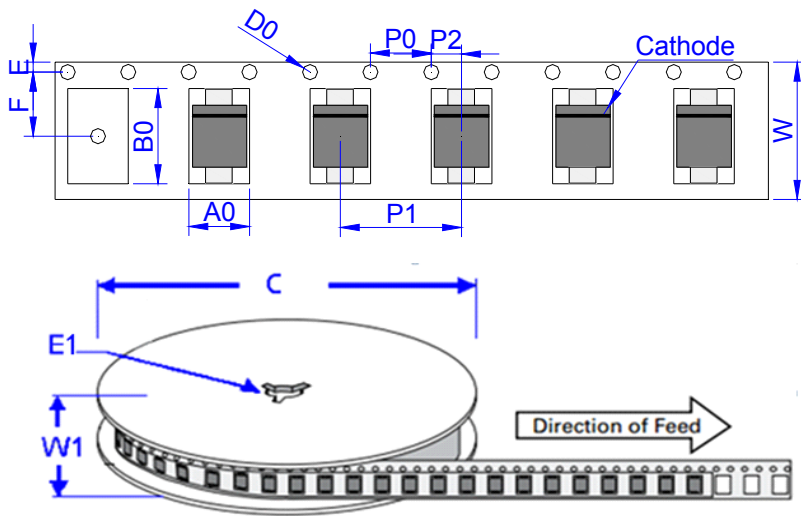


PACKAGE MECHANICAL DATA



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
SMDJxxAH/CAH	0.31	3,000	48,000	13 inch reel pack

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