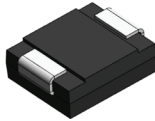


# SMCJ

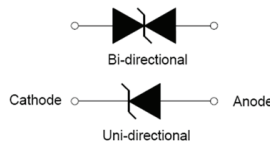
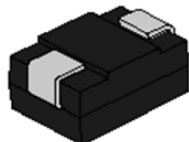
## Automotive grade 1500 W Transient voltage suppressor



### Product features

- Automotive grade (AEC-Q101 qualified)
- Low profile SMC package
- Excellent clamping capability
- High reliability application
- 1500 W peak pulse power capability at 10/1000  $\mu$ s waveform
- Typical  $I_R$  less than 1  $\mu$ A
- Fast response time: typically less than 1.0 ps from 0 V to  $V_{BR}$  minimum
- Plastic package meets UL 94 V-0 flammability rating
- Meets moisture sensitivity level (MSL) level 1
- Terminal: tin plated, solderable per J-STD-002
- UL 497B recognized.  
File No. : E198449 Guide QVGQ2

### PIN configuration



### Applications

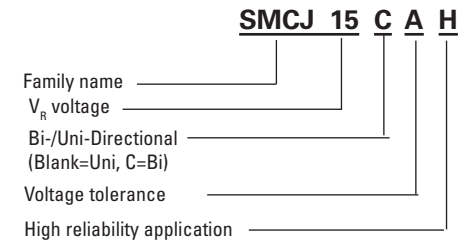
- Automotive chassis and safety systems
- Advanced driver assistance systems (ADAS)
- Communication and infotainment systems
- Network systems and body electronics
- Power Train controls
- xEV and battery systems

### Environmental compliance and general specifications

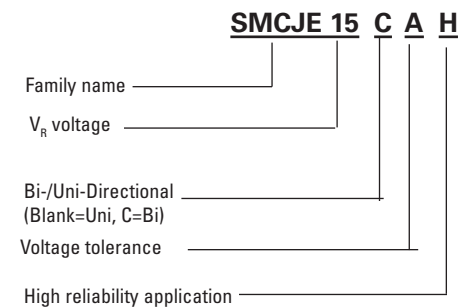
- AEC-Q101 qualified



### Ordering part number



### Alternate ordering part number



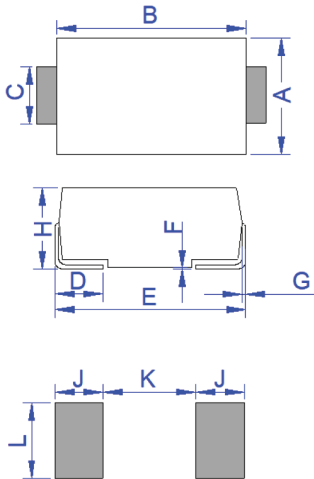
### Absolute maximum ratings

(+25 °C, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Storage operating junction temperature range	$T_{STG}/T_J$	-55 to +150	°C
Steady state power dissipation at $T_L = +75$ °C	$P_{M(AV)}$	6.5	W
Peak pulse power dissipation on 10/1000 $\mu$ s waveform	$P_{PP}$	1500	W
Maximum instantaneous forward voltage at 100 A for unidirectional	$V_F$	5	V
Peak forward surge current, 8.3 ms single half sine wave <sup>1</sup>	$I_{FSM}$	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

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

### Mechanical parameters, pad layout- mm/inches



Dimension	Millimeters		Inches	
	Minimum	Maximum	Minimum	Maximum
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	-

### Part marking

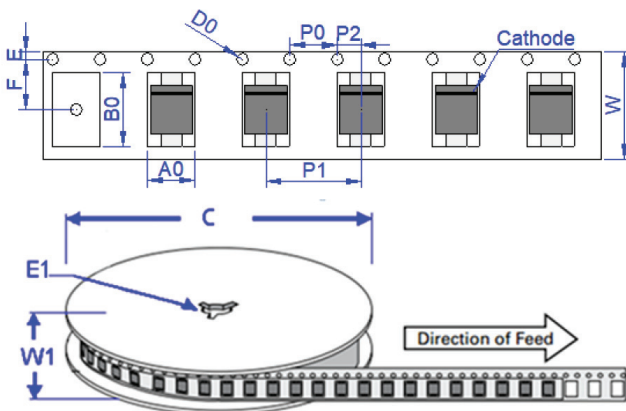


Cathode band (uni-polar only)  
Part marking: xxx = Refer to marking designator listed in Electrical Characteristics table  
yyyy= date code

### Packaging information - mm/inches

Drawing not to scale.

Supplied in tape and reel packaging, 3,000 parts per 13" diameter reel (EIA-481 compliant)



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

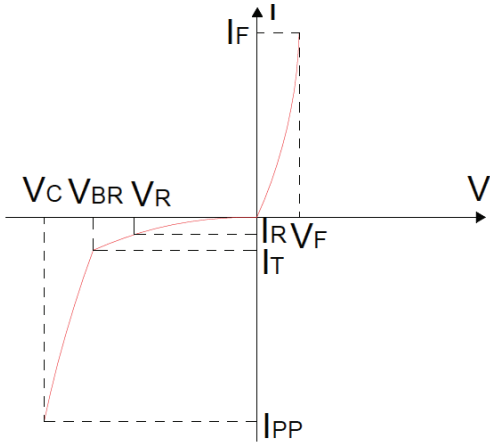
Electrical specifications (+25 °C)

Part number		Marking		V <sub>R</sub> (V)	I <sub>R</sub> @ V <sub>R</sub> (μA)	V <sub>BR</sub> @ I <sub>T</sub>		I <sub>T</sub> (mA)	V <sub>C</sub> @ I <sub>PP</sub> max (V)	I <sub>PP</sub> (A)
Uni-polar	Bi-polar	Uni	Bi			min (V)	max (V)			
SMCJ15AH	SMCJ15CAH	GEM	BEM	15	1	16.7	18.5	1	24.4	61.5
SMCJ16AH	SMCJ16CAH	GEP	BEP	16	1	17.8	19.7	1	26	57.7
SMCJ17AH	SMCJ17CAH	GER	BER	17	1	18.9	20.9	1	27.6	54.4
SMCJ18AH	SMCJ18CAH	GET	BET	18	1	20	22.1	1	29.2	51.4
SMCJ20AH	SMCJ20CAH	GEV	BEV	20	1	22.2	24.5	1	32.4	46.3
SMCJ22AH	SMCJ22CAH	GEX	BEX	22	1	24.4	26.9	1	35.5	42.3
SMCJ24AH	SMCJ24CAH	GEZ	BEZ	24	1	26.7	29.5	1	38.9	38.6
SMCJ26AH	SMCJ26CAH	GFE	BFE	26	1	28.9	31.9	1	42.1	35.6
SMCJ28AH	SMCJ28CAH	GFG	BFG	28	1	31.1	34.4	1	45.4	33.1
SMCJ30AH	SMCJ30CAH	GFK	BFK	30	1	33.3	36.8	1	48.4	31
SMCJ33AH	SMCJ33CAH	GFM	BFM	33	1	36.7	40.6	1	53.3	28.2
SMCJ36AH	SMCJ36CAH	GFP	BFP	36	1	40	44.2	1	58.1	25.8
SMCJ40AH	SMCJ40CAH	GFR	BFR	40	1	44.4	49.1	1	64.5	23.3
SMCJ43AH	SMCJ43CAH	GFT	BFT	43	1	47.8	52.8	1	69.4	21.6
SMCJ45AH	SMCJ45CAH	GFV	BFV	45	1	50	55.3	1	72.7	20.6
SMCJ48AH	SMCJ48CAH	GFX	BFX	48	1	53.3	58.9	1	77.4	19.4
SMCJ51AH	SMCJ51CAH	GFZ	BFZ	51	1	56.7	62.7	1	82.4	18.2
SMCJ54AH	SMCJ54CAH	GGE	BGE	54	1	60	66.3	1	87.1	17.2
SMCJ58AH	SMCJ58CAH	GGG	BGG	58	1	64.4	71.2	1	93.6	16.1
SMCJ60AH	SMCJ60CAH	GGK	BGK	60	1	66.7	73.7	1	96.8	15.5
SMCJ64AH	SMCJ64CAH	GGM	BGM	64	1	71.1	78.6	1	103	14.6
SMCJ70AH	SMCJ70CAH	GGP	BGP	70	1	77.8	86	1	113	13.3
SMCJ75AH	SMCJ75CAH	GGR	BGR	75	1	83.3	92.1	1	121	12.4
SMCJ78AH	SMCJ78CAH	GGT	BGT	78	1	86.7	95.8	1	126	11.9
SMCJ85AH	SMCJ85CAH	GGV	BGV	85	1	94.4	104	1	137	11
SMCJ90AH	SMCJ90CAH	GGX	BGX	90	1	100	111	1	146	10.3
SMCJ100AH	SMCJ100CAH	GGZ	BGZ	100	1	111	123	1	162	9.3
SMCJ110AH	SMCJ110CAH	GHE	BHE	110	1	122	135	1	177	8.5
SMCJ120AH	SMCJ120CAH	GHG	BHG	120	1	133	147	1	193	7.8
SMCJ130AH	SMCJ130CAH	GHK	BHK	130	1	144	159	1	209	7.2
SMCJ150AH	SMCJ150CAH	GHM	BHM	150	1	167	185	1	243	6.2
SMCJ160AH	SMCJ160CAH	GHP	BHP	160	1	178	197	1	259	5.8
SMCJ170AH	SMCJ170CAH	GHR	BHR	170	1	189	209	1	275	5.5
SMCJ180AH	SMCJ180CAH	GHT	BHT	180	1	201	222	1	292	5.2
SMCJ190AH	SMCJ190CAH	GHU	BHU	190	1	211	234	1	307	4.9
SMCJ200AH	SMCJ200CAH	GHV	BHV	200	1	224	247	1	324	4.7
SMCJ210AH	SMCJ210CAH	GHW	BHW	210	1	233	258	1	337	4.5
SMCJ220AH	SMCJ220CAH	GHX	BHX	220	1	246	272	1	356	4.2
SMCJ250AH	SMCJ250CAH	GJG	BJG	250	1	279	309	1	405	3.7
SMCJ300AH	SMCJ300CAH	GJK	BJK	300	1	335	371	1	486	3.1
SMCJ350AH	SMCJ350CAH	GJM	BJM	350	1	391	432	1	567	2.7
SMCJ400AH	SMCJ400CAH	GJP	BJP	400	1	447	494	1	648	2.3
SMCJ440AH	SMCJ440CAH	GJR	BJR	440	1	492	543	1	713	2.1

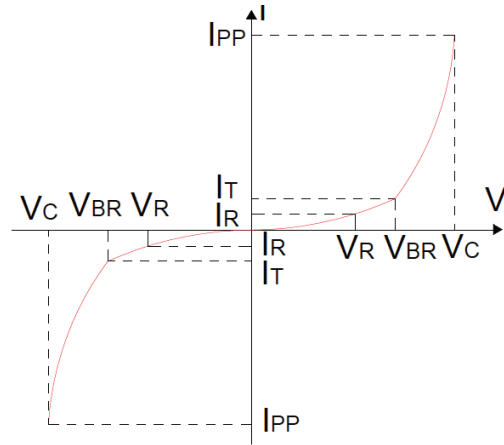
Note: Standard part numbers listed. Alternate part numbers have the addition of an E and a "." for the "." where applicable. Example standard part number SMCJ15AH, Alternate part number SMCJE15AH

**Ratings and V-I characteristic curves** (+25 °C unless otherwise noted)

**V- I curve characteristics (Uni-directional)**



**V- I curve characteristics (Bi-directional)**



Surge waveform: 10/1000  $\mu$ s

$V_R$ : Stand-off voltage – Maximum voltage that can be applied

$V_{BR}$ : Breakdown voltage

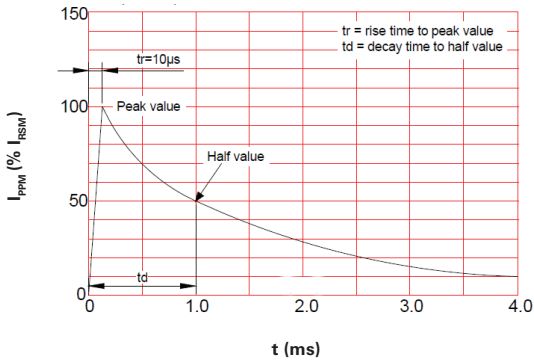
$V_C$ : Clamping voltage – Peak voltage measured across the suppressor at a specified  $I_{PP}$

$I_R$ : Reverse leakage current

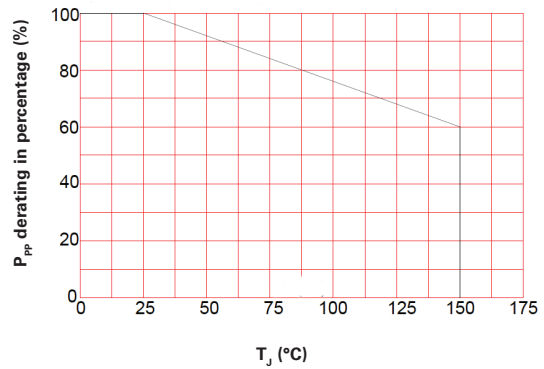
$I_T$ : Test current

$V_F$ : Forward voltage drop for Uni-directional

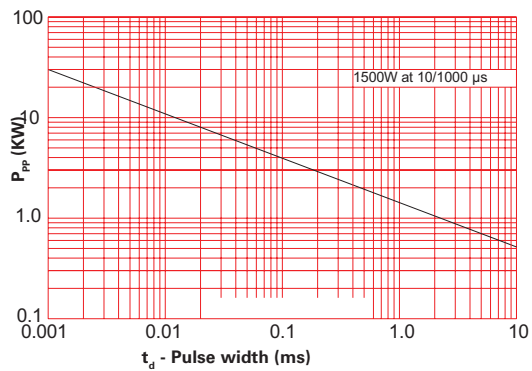
**Pulse waveform**



**Pulse derating curve**



**Peak pulse power dissipation curve**



Solder reflow profile

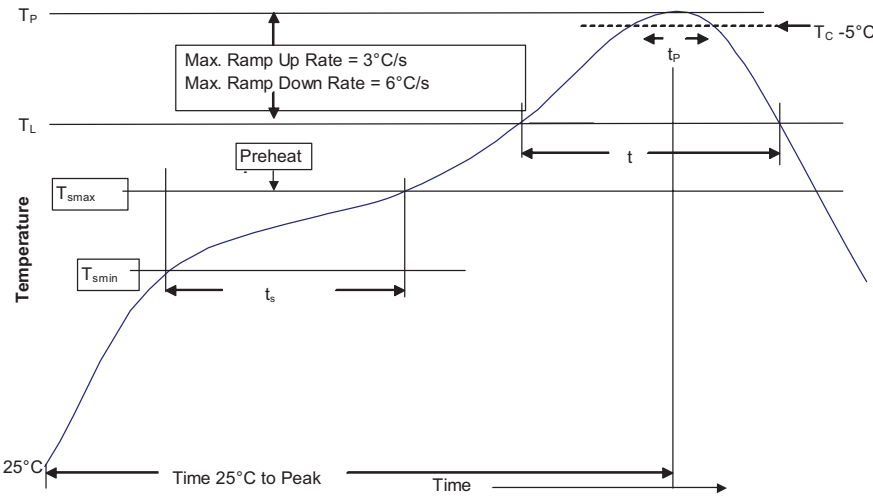


Table 1 - Standard SnPb solder ( $T_C$ )

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder ( $T_C$ )

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak		
• Temperature min. ( $T_{smin}$ )	100 °C	150 °C
• Temperature max. ( $T_{smax}$ )	150 °C	200 °C
• Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60-120 seconds	60 - 180 seconds
Ramp up rate $T_L$ to $T_p$	3 °C/ second max.	3 °C/ second max.
Liquidous temperature ( $T_L$ )	183 °C	217 °C
Time ( $t_L$ ) maintained above $T_L$	60-150 seconds	60-150 seconds
Peak package body temperature ( $T_p$ )*	Table 1	Table 2 (+0, -5 °C)
Time ( $t_p$ )* within 5 °C of the specified classification temperature ( $T_c$ )	20 seconds*	40 seconds*
Ramp-down rate ( $T_p$ to $T_L$ )	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

\* Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

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Printed in USA  
Publication No. ELX1064  
September 2024

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