

SMCJE

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 μ s waveform
- Typical I_R less than 1 μ 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

Applications

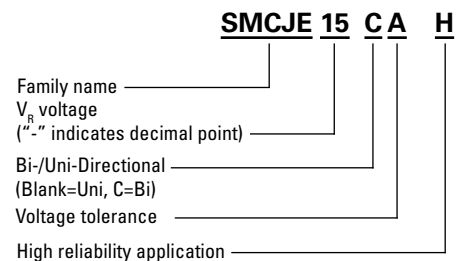
- Automotive chassis and safety systems
- Advanced driver assistance systems (ADAS)
- Communication and infotainment systems
- Network systems and body electronics
- Power Train controls
- xEV and battery systems

Environmental compliance and general specifications

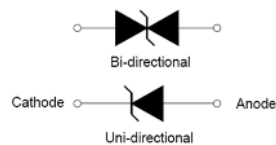
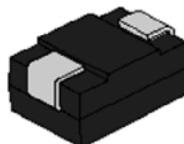
- AEC-Q101 qualified



Ordering part number



PIN configuration



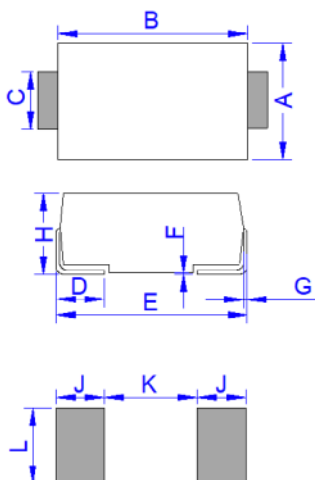
Absolute maximum ratings

(+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 μ 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 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

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:

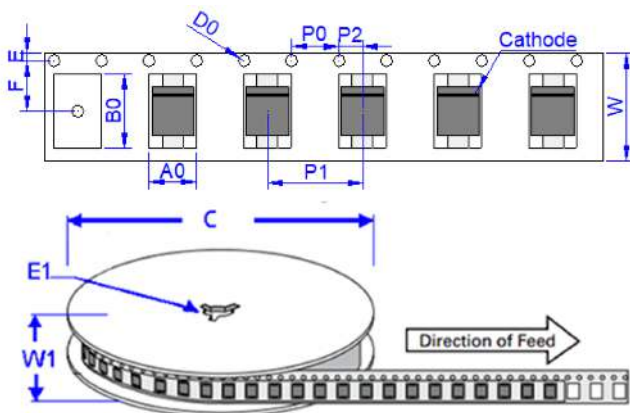
xxxx = Date code

yyy- Refer to marking designator listed in Electrical characteristics table

Packaging information - mm/inches

Drawing not to scale.

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



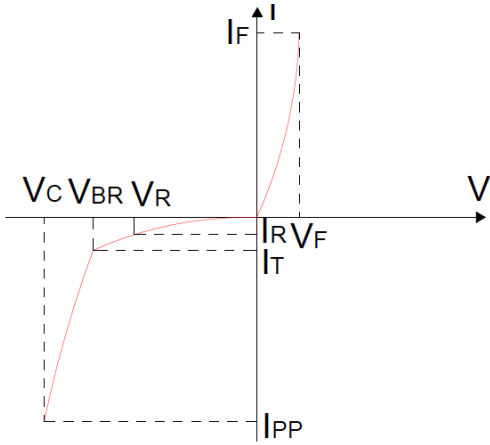
Dimensions	Millimeters	Inches
A0	6.05 ± 0.3	0.238 ± 0.012
B0	8.31 ± 0.3	0.327 ± 0.012
C	330.0	13.0
D0	1.55 ± 0.1	0.061 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3 ± 0.3	0.524 ± 0.012
F	7.50 ± 0.2	0.295 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	8.00 ± 0.2	0.3145 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	16.0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

Electrical specifications (+25 °C)

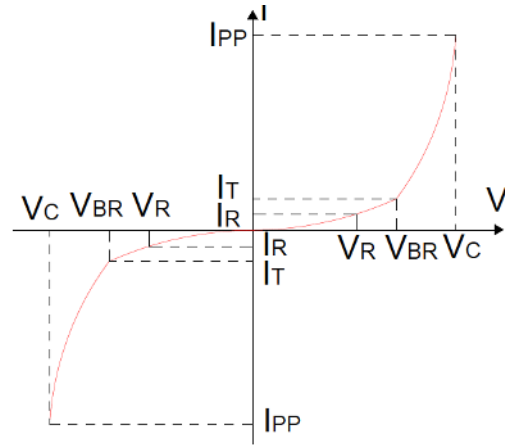
Part number		Marking		V _R (V)	I _R @V _R (μA)	V _{BR} @I _T		I _T (mA)	V _C @I _{PP} max (V)	I _{PP} (A)
Uni-polar	Bi-polar	Uni	Bi			min (V)	max (V)			
SMCJE15AH	SMCJE15CAH	GEM	BEM	15	1	16.7	18.5	1	24.4	61.5
SMCJE16AH	SMCJE16CAH	GEP	BEP	16	1	17.8	19.7	1	26	57.7
SMCJE17AH	SMCJE17CAH	GER	BER	17	1	18.9	20.9	1	27.6	54.4
SMCJE18AH	SMCJE18CAH	GET	BET	18	1	20	22.1	1	29.2	51.4
SMCJE20AH	SMCJE20CAH	GEV	BEV	20	1	22.2	24.5	1	32.4	46.3
SMCJE22AH	SMCJE22CAH	GEX	BEX	22	1	24.4	26.9	1	35.5	42.3
SMCJE24AH	SMCJE24CAH	GEZ	BEZ	24	1	26.7	29.5	1	38.9	38.6
SMCJE26AH	SMCJE26CAH	GFE	BFE	26	1	28.9	31.9	1	42.1	35.6
SMCJE28AH	SMCJE28CAH	GFG	BFG	28	1	31.1	34.4	1	45.4	33.1
SMCJE30AH	SMCJE30CAH	GFK	BFK	30	1	33.3	36.8	1	48.4	31
SMCJE33AH	SMCJE33CAH	GFM	BFM	33	1	36.7	40.6	1	53.3	28.2
SMCJE36AH	SMCJE36CAH	GFP	BFP	36	1	40	44.2	1	58.1	25.8
SMCJE40AH	SMCJE40CAH	GFR	BFR	40	1	44.4	49.1	1	64.5	23.3
SMCJE43AH	SMCJE43CAH	GFT	BFT	43	1	47.8	52.8	1	69.4	21.6
SMCJE45AH	SMCJE45CAH	GFV	BFV	45	1	50	55.3	1	72.7	20.6
SMCJE48AH	SMCJE48CAH	GFX	BFX	48	1	53.3	58.9	1	77.4	19.4
SMCJE51AH	SMCJE51CAH	GFZ	BFZ	51	1	56.7	62.7	1	82.4	18.2
SMCJE54AH	SMCJE54CAH	GGE	BGE	54	1	60	66.3	1	87.1	17.2
SMCJE58AH	SMCJE58CAH	GGG	BGG	58	1	64.4	71.2	1	93.6	16.1
SMCJE60AH	SMCJE60CAH	GGK	BGK	60	1	66.7	73.7	1	96.8	15.5
SMCJE64AH	SMCJE64CAH	GGM	BGM	64	1	71.1	78.6	1	103	14.6
SMCJE70AH	SMCJE70CAH	GGP	BGP	70	1	77.8	86	1	113	13.3
SMCJE75AH	SMCJE75CAH	GGR	BGR	75	1	83.3	92.1	1	121	12.4
SMCJE78AH	SMCJE78CAH	GGT	BGT	78	1	86.7	95.8	1	126	11.9
SMCJE85AH	SMCJE85CAH	GGV	BGV	85	1	94.4	104	1	137	11
SMCJE90AH	SMCJE90CAH	GGX	BGX	90	1	100	111	1	146	10.3
SMCJE100AH	SMCJE100CAH	GGZ	BGZ	100	1	111	123	1	162	9.3
SMCJE110AH	SMCJE110CAH	GHE	BHE	110	1	122	135	1	177	8.5
SMCJE120AH	SMCJE120CAH	GHG	BHG	120	1	133	147	1	193	7.8
SMCJE130AH	SMCJE130CAH	GHK	BHK	130	1	144	159	1	209	7.2
SMCJE150AH	SMCJE150CAH	GHM	BHM	150	1	167	185	1	243	6.2
SMCJE160AH	SMCJE160CAH	GHP	BHP	160	1	178	197	1	259	5.8
SMCJE170AH	SMCJE170CAH	GHR	BHR	170	1	189	209	1	275	5.5
SMCJE180AH	SMCJE180CAH	GHT	BHT	180	1	201	222	1	292	5.2
SMCJE190AH	SMCJE190CAH	GHU	BHU	190	1	211	234	1	307	4.9
SMCJE200AH	SMCJE200CAH	GHV	BHV	200	1	224	247	1	324	4.7
SMCJE210AH	SMCJE210CAH	GHW	BHW	210	1	233	258	1	337	4.5
SMCJE220AH	SMCJE220CAH	GHX	BHX	220	1	246	272	1	356	4.2
SMCJE250AH	SMCJE250CAH	GJG	BJG	250	1	279	309	1	405	3.7
SMCJE300AH	SMCJE300CAH	GJK	BJK	300	1	335	371	1	486	3.1
SMCJE350AH	SMCJE350CAH	GJM	BJM	350	1	391	432	1	567	2.7
SMCJE400AH	SMCJE400CAH	GJP	BJP	400	1	447	494	1	648	2.3
SMCJE440AH	SMCJE440CAH	GJR	BJR	440	1	492	543	1	713	2.1

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 μ s

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

V_{BR} : Breakdown voltage

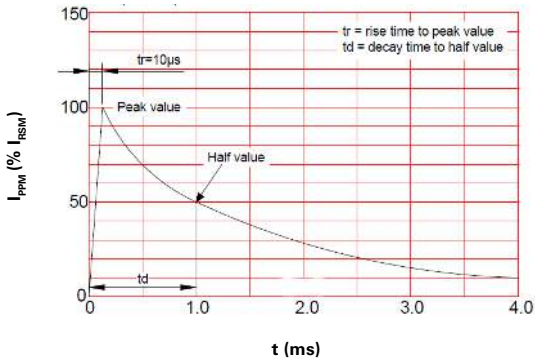
V_C : Clamping voltage – Peak voltage measured across the suppressor at a specified I_{PP}

I_R : Reverse leakage current

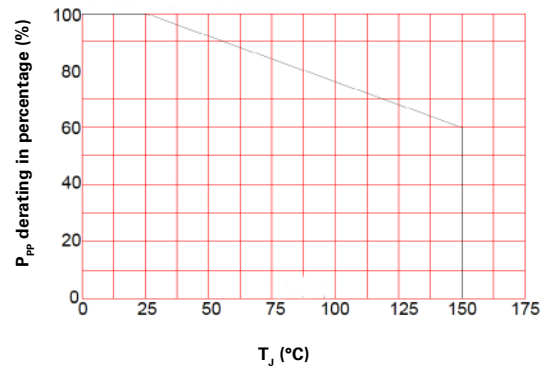
I_T : Test current

V_F : Forward voltage drop for Uni-directional

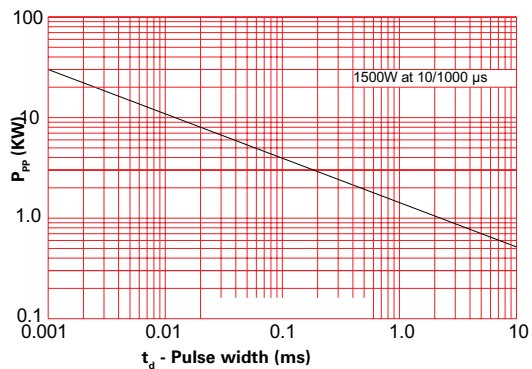
Pulse waveform



Pulse derating curve



Peak pulse power dissipation curve



Solder reflow profile

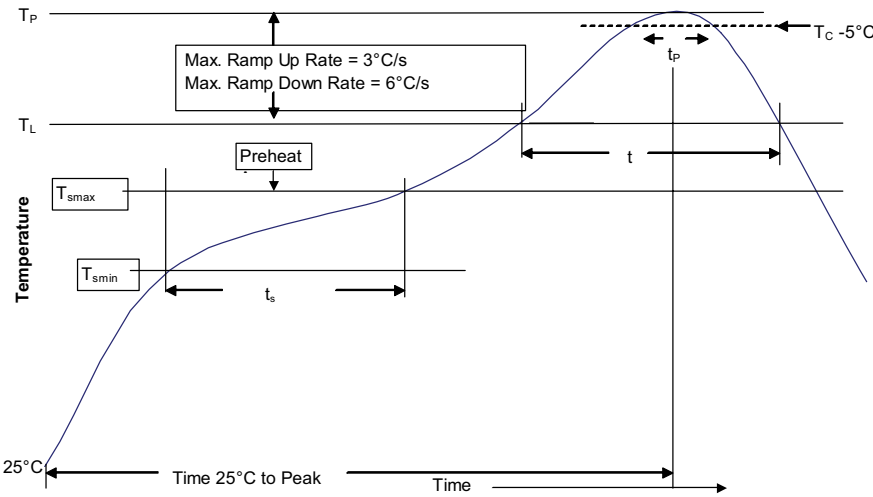


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm ³ <350	Volume mm ³ ≥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 ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >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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