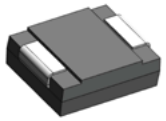
SMCJE

1500 W Transient voltage suppressor



Applications

- Consumer electronics
- Telecommunications
- Computing and servers
- Appliances
- Industrial automation
- Power conversion

Product features

- Low profile SMC package
- Excellent clamping capability
- 1500 W peak pulse power capability at 10/1000 µs waveform
- Typical I_R less than 1 µA above 11 V
- Fast response time: typically less than 1.0 ps from 0 V to V_{BR} minimum
- High temperature reflow soldering: +260 °C /40 s at terminal
- Plastic package meets UL 94 V-0 flammability rating
- Meets moisture sensitivity level (MSL) level 1
- Terminal: Solder plated leads, solderable per J-STD-002
- For surface mounted applications in order to optimize board space
- UL 497B recognized. File No. : E198449 Guide QVGQ2

Environmental compliance and general specifications

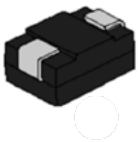
Pb HALOGEN HF FREE RoHS

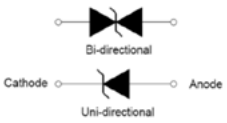
Ordering part number

SMCJE 5-0 C A

- Family name
- V_R voltage ("-" indicates decimal point)
- Bi-/Uni-Directional (Blank=Uni, C=Bi)
- Voltage tolerance

PIN configuration





Powering Business Worldwide

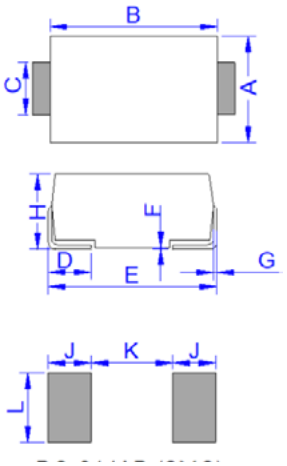
Absolute maximum ratings

(+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 µs waveform	P_{PP}	1500	W
Maximum instantaneous forward voltage at 100 A for unidirectional	V_F	5.0	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

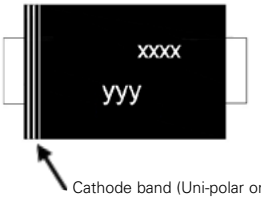
1. Measured on 8.3 ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle = 4 per minute maximum

Mechanical parameters, pad layout- mm



	Millimeters		Inches	
Dimension	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

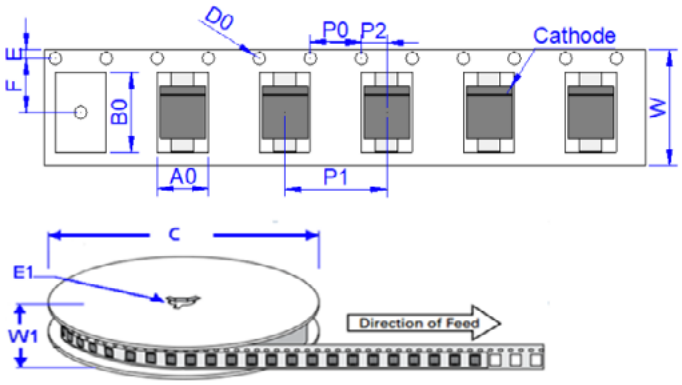


Part marking: xxxx = Date code
yyy- Refer to marking designator listed in Electrical Characteristics table

Packaging information (mm)

Drawing not to scale.

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



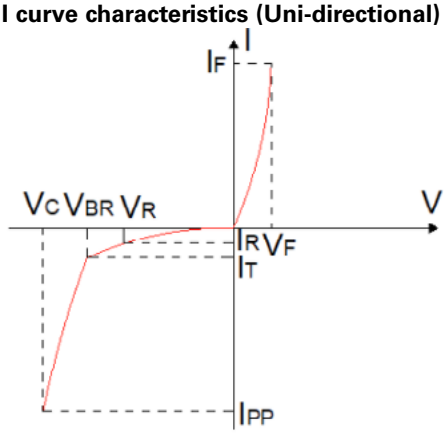
Dimension	Millimeters	Inches
A0	6.05 ± 0.3	0.238 ± 0.012
B0	8.31 ± 0.3	0.327 ± 0.012
C	330.0	13.0
D0	1.55 ± 0.1	0.061 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3 ± 0.3	0.524 ± 0.012
F	7.50 ± 0.2	0.295 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	8.00 ± 0.2	0.315 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	16.0 ± 0.2	0.630 ± 0.008
W1	19.7 ± 2.0	0.776 ± 0.079

Electrical characteristics (+25 °C)

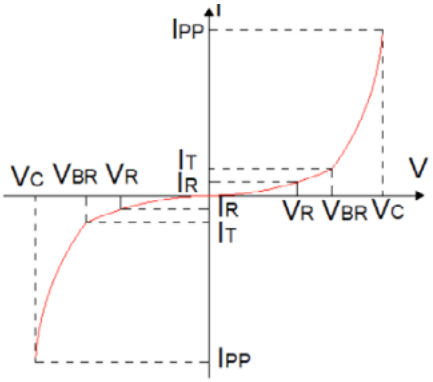
Part number		Marking		V_R	I_R @ V_R	V_{BR} @ I_T		I_T	V_C @ I_{PP}	I_{PP}
Uni-polar	Bi-polar	Uni	Bi	(V)	(µA)	min (V)	max (V)	(mA)	max (V)	(A)
SMCJE5-0A	SMCJE5-0CA	GDE	BDE	5	300	6.4	7	10	9.2	163
SMCJE6-0A	SMCJE6-0CA	GDG	BDG	6	250	6.67	7.37	10	10.3	145.6
SMCJE6-5A	SMCJE6-5CA	GDK	BDK	6.5	150	7.22	7.98	10	11.2	134
SMCJE7-0A	SMCJE7-0CA	GDM	BDM	7	100	7.78	8.6	10	12	125
SMCJE7-5A	SMCJE7-5CA	GDP	BDP	7.5	50	8.33	9.21	1	12.9	116.3
SMCJE8-0A	SMCJE8-0CA	GDR	BDR	8	30	8.89	9.83	1	13.6	110.3
SMCJE8-5A	SMCJE8-5CA	GDT	BDT	8.5	20	9.44	10.4	1	14.4	104.2
SMCJE9-0A	SMCJE9-0CA	GDV	BDV	9	10	10	11.1	1	15.4	97.4
SMCJE10A	SMCJE10CA	GDX	BDX	10	5	11.1	12.3	1	17	88.2
SMCJE11A	SMCJE11CA	GDZ	BDZ	11	2	12.2	13.5	1	18.2	82.4
SMCJE12A	SMCJE12CA	GEE	BEE	12	1	13.3	14.7	1	19.9	75.4
SMCJE13A	SMCJE13CA	GEG	BEG	13	1	14.4	15.9	1	21.5	69.8
SMCJE14A	SMCJE14CA	GEK	BEK	14	1	15.6	17.2	1	23.2	64.7
SMCJE15A	SMCJE15CA	GEM	BEM	15	1	16.7	18.5	1	24.4	61.5
SMCJE16A	SMCJE16CA	GEP	BEP	16	1	17.8	19.7	1	26	57.7
SMCJE17A	SMCJE17CA	GER	BER	17	1	18.9	20.9	1	27.6	54.4
SMCJE18A	SMCJE18CA	GET	BET	18	1	20	22.1	1	29.2	51.4
SMCJE20A	SMCJE20CA	GEV	BEV	20	1	22.2	24.5	1	32.4	46.3
SMCJE22A	SMCJE22CA	GEX	BEX	22	1	24.4	26.9	1	35.5	42.3
SMCJE24A	SMCJE24CA	GEZ	BEZ	24	1	26.7	29.5	1	38.9	38.6
SMCJE26A	SMCJE26CA	GFE	BFE	26	1	28.9	31.9	1	42.1	35.6
SMCJE28A	SMCJE28CA	GFG	BFG	28	1	31.1	34.4	1	45.4	33.1
SMCJE30A	SMCJE30CA	GFK	BFK	30	1	33.3	36.8	1	48.4	31
SMCJE33A	SMCJE33CA	GFM	BFM	33	1	36.7	40.6	1	53.3	28.2
SMCJE36A	SMCJE36CA	GFP	BFP	36	1	40	44.2	1	58.1	25.8
SMCJE40A	SMCJE40CA	GFR	BFR	40	1	44.4	49.1	1	64.5	23.3
SMCJE43A	SMCJE43CA	GFT	BFT	43	1	47.8	52.8	1	69.4	21.6
SMCJE45A	SMCJE45CA	GFV	BFV	45	1	50	55.3	1	72.7	20.6
SMCJE48A	SMCJE48CA	GFX	BFX	48	1	53.3	58.9	1	77.4	19.4
SMCJE51A	SMCJE51CA	GFZ	BFZ	51	1	56.7	62.7	1	82.4	18.2
SMCJE54A	SMCJE54CA	GGE	BGE	54	1	60	66.3	1	87.1	17.2
SMCJE58A	SMCJE58CA	GGG	BGG	58	1	64.4	71.2	1	93.6	16.1
SMCJE60A	SMCJE60CA	GGK	BGK	60	1	66.7	73.7	1	96.8	15.5
SMCJE64A	SMCJE64CA	GGM	BGM	64	1	71.1	78.6	1	103	14.6
SMCJE70A	SMCJE70CA	GGP	BGP	70	1	77.8	86	1	113	13.3
SMCJE75A	SMCJE75CA	GGR	BGR	75	1	83.3	92.1	1	121	12.4
SMCJE78A	SMCJE78CA	GGT	BGT	78	1	86.7	95.8	1	126	11.9
SMCJE85A	SMCJE85CA	GGV	BGV	85	1	94.4	104	1	137	11
SMCJE90A	SMCJE90CA	GGX	BGX	90	1	100	111	1	146	10.3
SMCJE100A	SMCJE100CA	GGZ	BGZ	100	1	111	123	1	162	9.3
SMCJE110A	SMCJE110CA	GHE	BHE	110	1	122	135	1	177	8.5
SMCJE120A	SMCJE120CA	GHG	BHG	120	1	133	147	1	193	7.8
SMCJE130A	SMCJE130CA	GHK	BHK	130	1	144	159	1	209	7.2
SMCJE150A	SMCJE150CA	GHM	BHM	150	1	167	185	1	243	6.2
SMCJE160A	SMCJE160CA	GHP	BHP	160	1	178	197	1	259	5.8
SMCJE170A	SMCJE170CA	GHR	BHR	170	1	189	209	1	275	5.5
SMCJE180A	SMCJE180CA	GHT	BHT	180	1	201	222	1	292	5.2
SMCJE190A	SMCJE190CA	GHU	BHU	190	1	211	234	1	307	4.9
SMCJE200A	SMCJE200CA	GHV	BHV	200	1	224	247	1	324	4.7
SMCJE210A	SMCJE210CA	GHW	BHW	210	1	233	258	1	337	4.5
SMCJE220A	SMCJE220CA	GHX	BHX	220	1	246	272	1	356	4.2
SMCJE250A	SMCJE250CA	GJG	BJG	250	1	279	309	1	405	3.7
SMCJE300A	SMCJE300CA	GJK	BJK	300	1	335	371	1	486	3.1
SMCJE350A	SMCJE350CA	GJM	BJM	350	1	391	432	1	567	2.7
SMCJE400A	SMCJE400CA	GJP	BJP	400	1	447	494	1	648	2.3
SMCJE440A	SMCJE440CA	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 µs

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

V_{BR}: Breakdown voltage

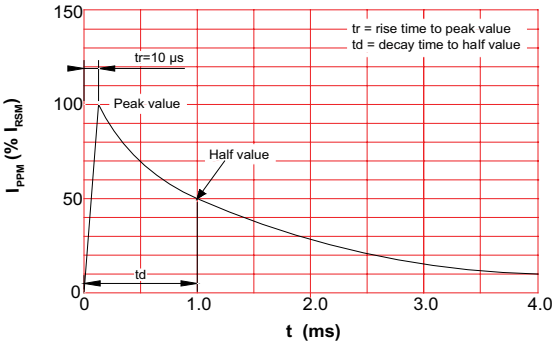
V_C: Clamping voltage – Peak voltage measured across the suppressor at a specified I_{PP}

I_R: Reverse leakage current

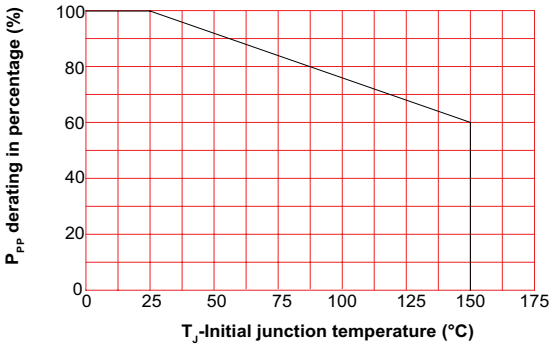
I_T: Test current

V_F: Forward voltage drop for Uni-directional TVS diode

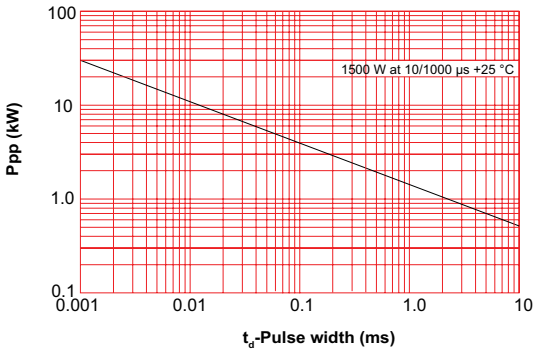
Pulse waveform



Pulse derating curve



Peak pulse power dissipation vs. pulse width



Solder reflow profile

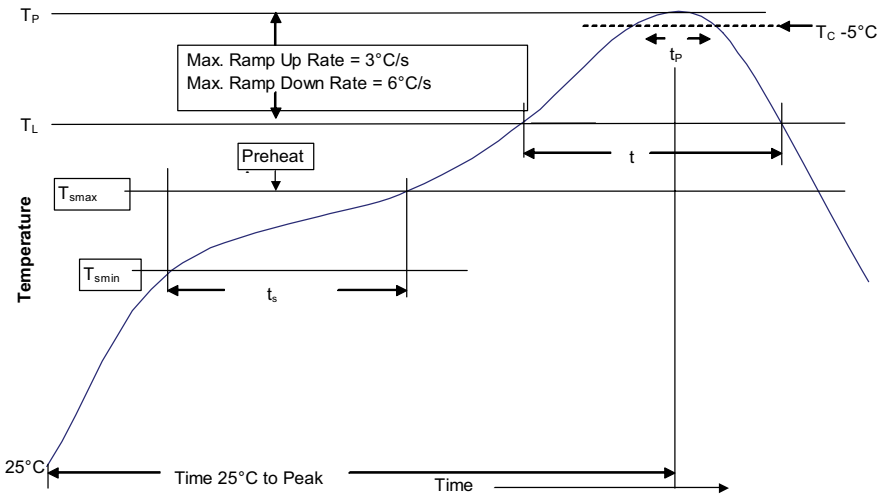


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm3 <350	Volume mm3 ≥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 mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >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) Time (t_L) maintained above T_L		183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body temperature (T_P)*		Table 1	Table 2
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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