5-0SMDJ

5000 W Transient voltage suppressor

Applications

- Consumer electronics
- Telecommunications
- Computing and servers
- Appliances
- Industrial automation
- Mobile and wearables

Product features

- Low profile SMC package
- Excellent clamping capability
- 5000 W peak pulse power capability at 10/1000 µs waveform
- Typical I_R less than 1 µA above 30 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

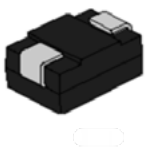
Pb HALOGEN HF FREE RoHS

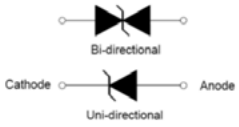
Ordering part number

5-0SMDJ 11 C A

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

PIN configuration





Powering Business Worldwide

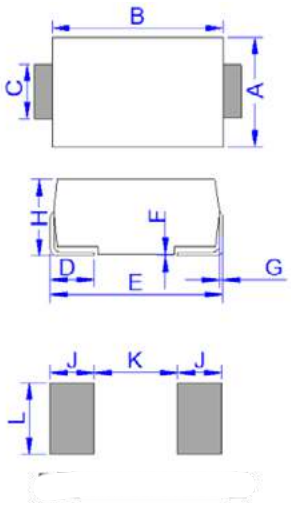
Absolute maximum ratings

(+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}	5000	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}	300	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

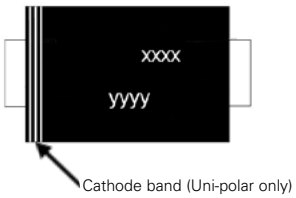
1. Measured on 8.3 ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle = 4 per minute maximum

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

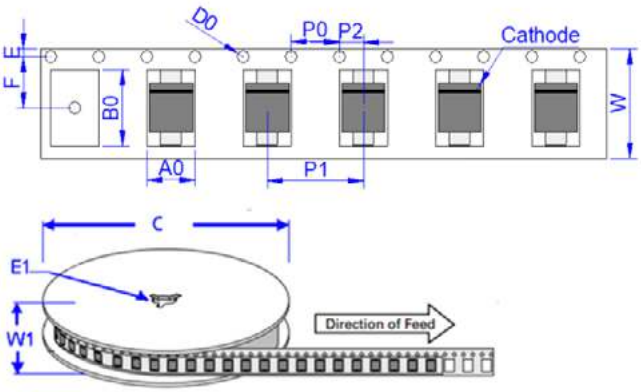


Part marking: xxxx = Date code
yyyy- Refer to marking designator listed in Electrical Characteristics table

Packaging information (mm)

Drawing not to scale.

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



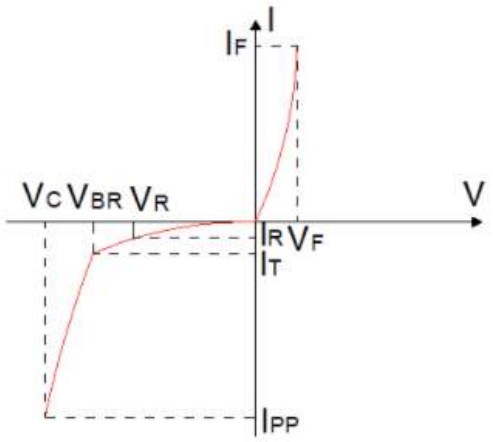
Dimensions	Millimeters	Inches
A0	6.05 ± 0.3	0.238 ± 0.012
B0	8.31 ± 0.3	0.327 ± 0.012
C	330.0	13.0
D0	1.55 ± 0.1	0.061 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3 ± 0.3	0.524 ± 0.012
F	7.50 ± 0.2	0.295 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	8.00 ± 0.2	0.315 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	16.0 ±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

Electrical characteristics (+25 °C)

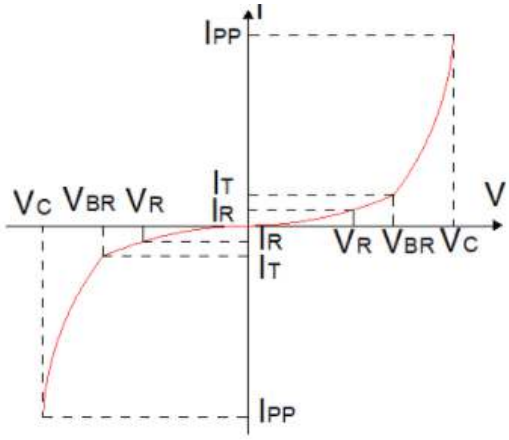
Part number		Marking		V_R	I_R @ V_R	V_{BR} @ I_T		I_T	V_C @ I_{PP}	I_{PP}
Uni-polar	Bi-polar	Uni	Bi	(V)	(µA)	min (V)	max (V)	(mA)	max (V)	(A)
5-0SMDJ11A	5-0SMDJ11CA	5PEN	5BEN	11	5	12.2	13.5	10	18.2	275
5-0SMDJ12A	5-0SMDJ12CA	5PEP	5BEP	12	5	13.3	14.7	10	19.9	252
5-0SMDJ13A	5-0SMDJ13CA	5PEQ	5BEQ	13	5	14.4	15.9	10	21.5	233
5-0SMDJ14A	5-0SMDJ14CA	5PER	5BER	14	5	15.6	17.2	10	23.2	216
5-0SMDJ15A	5-0SMDJ15CA	5PES	5BES	15	5	16.7	18.5	1	24.4	205
5-0SMDJ16A	5-0SMDJ16CA	5PET	5BET	16	5	17.8	19.7	1	26	193
5-0SMDJ17A	5-0SMDJ17CA	5PEU	5BEU	17	5	18.9	20.9	1	27.6	181
5-0SMDJ18A	5-0SMDJ18CA	5PEV	5BEV	18	5	20	22.1	1	29.2	172
5-0SMDJ20A	5-0SMDJ20CA	5PEW	5BEW	20	5	22.2	24.5	1	32.4	155
5-0SMDJ22A	5-0SMDJ22CA	5PEX	5BEX	22	5	24.4	26.9	1	35.5	141
5-0SMDJ24A	5-0SMDJ24CA	5PEZ	5BEZ	24	5	26.7	29.5	1	38.9	129
5-0SMDJ26A	5-0SMDJ26CA	5PFE	5BFE	26	5	28.9	31.9	1	42.1	119
5-0SMDJ28A	5-0SMDJ28CA	5PFG	5BFG	28	5	31.1	34.4	1	45.4	110
5-0SMDJ30A	5-0SMDJ30CA	5PFK	5BFK	30	5	33.3	36.8	1	48.4	103
5-0SMDJ33A	5-0SMDJ33CA	5PFM	5BFM	33	1	36.7	40.6	1	53.3	93.9
5-0SMDJ36A	5-0SMDJ36CA	5PFP	5BFP	36	1	40	44.2	1	58.1	86.1
5-0SMDJ40A	5-0SMDJ40CA	5PFR	5BFR	40	1	44.4	49.1	1	64.5	77.6
5-0SMDJ43A	5-0SMDJ43CA	5PFT	5BFT	43	1	47.8	52.8	1	69.4	72.1
5-0SMDJ45A	5-0SMDJ45CA	5PFV	5BFV	45	1	50	55.3	1	72.7	68.8
5-0SMDJ48A	5-0SMDJ48CA	5PFX	5BFX	48	1	53.3	58.9	1	77.4	64.7
5-0SMDJ51A	5-0SMDJ51CA	5PFZ	5BFZ	51	1	56.7	62.7	1	82.4	60.7
5-0SMDJ54A	5-0SMDJ54CA	5PGE	5BGE	54	1	60	66.3	1	87.1	57.5
5-0SMDJ58A	5-0SMDJ58CA	5PGG	5BGG	58	1	64.4	71.2	1	93.6	53.5
5-0SMDJ60A	5-0SMDJ60CA	5PGK	5BGK	60	1	66.7	73.7	1	96.8	51.7
5-0SMDJ64A	5-0SMDJ64CA	5PGM	5BGM	64	1	71.1	78.6	1	103	48.6
5-0SMDJ70A	5-0SMDJ70CA	5PGP	5BGP	70	1	77.8	86	1	113	44.3
5-0SMDJ75A	5-0SMDJ75CA	5PGR	5BGR	75	1	83.3	92.1	1	121	41.4
5-0SMDJ78A	5-0SMDJ78CA	5PGT	5BGT	78	1	86.7	95.8	1	126	39.7
5-0SMDJ85A	5-0SMDJ85CA	5PGV	5BGV	85	1	94.4	104	1	137	36.5
5-0SMDJ90A	5-0SMDJ90CA	5PGX	5BGX	90	1	100	111	1	146	34.3
5-0SMDJ100A	5-0SMDJ100CA	5PGZ	5BGZ	100	1	111	123	1	162	30.9
5-0SMDJ110A	5-0SMDJ110CA	5PHE	5BHE	110	1	122	135	1	177	28.3
5-0SMDJ120A	5-0SMDJ120CA	5PHG	5BHG	120	1	133	147	1	193	26
5-0SMDJ130A	5-0SMDJ130CA	5PHK	5BHK	130	1	144	159	1	209	24
5-0SMDJ150A	5-0SMDJ150CA	5PHM	5BHM	150	1	167	185	1	243	20.6
5-0SMDJ160A	5-0SMDJ160CA	5PHP	5BHP	160	1	178	197	1	259	19.3
5-0SMDJ170A	5-0SMDJ170CA	5PHR	5BHR	170	1	189	209	1	275	18.2

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

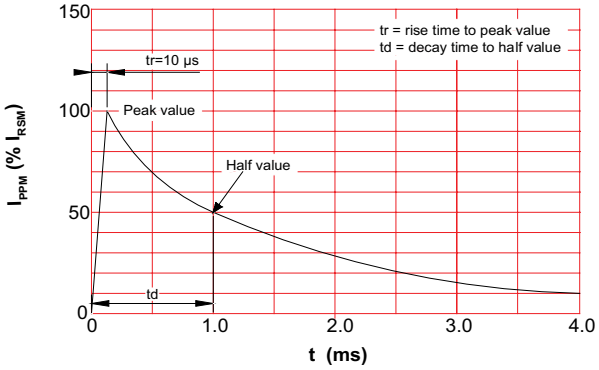
V_{BR}: Breakdown voltage

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

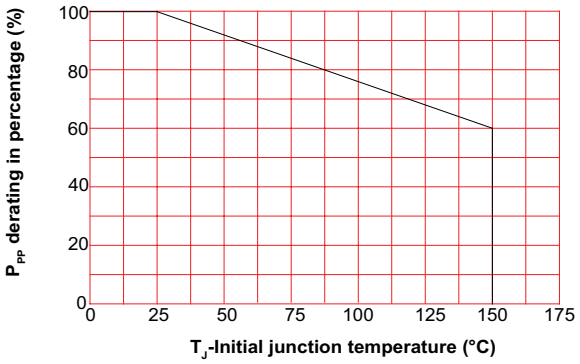
I_R: Reverse leakage current

I_T: Test current

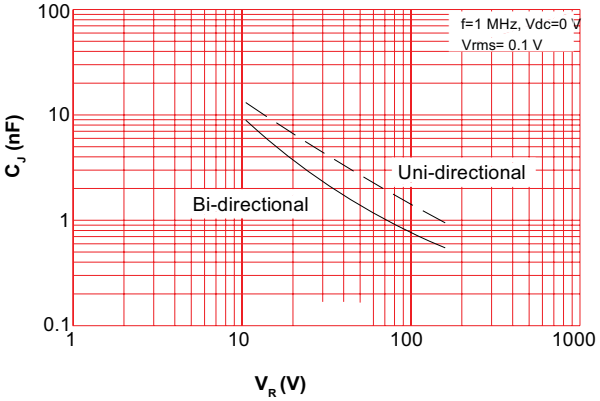
Pulse waveform



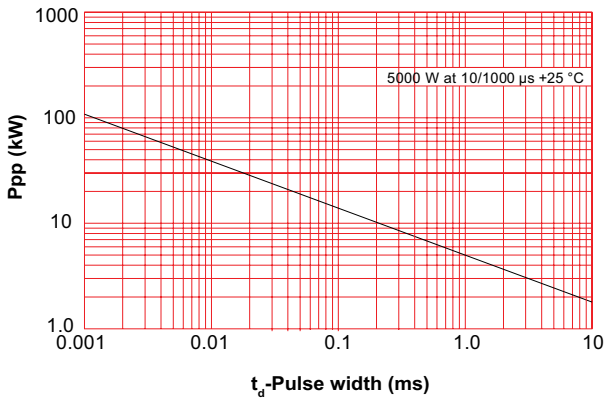
Pulse derating curve



Typical junction capacitance



Peak pulse power dissipation vs. pulse width



Solder reflow profile

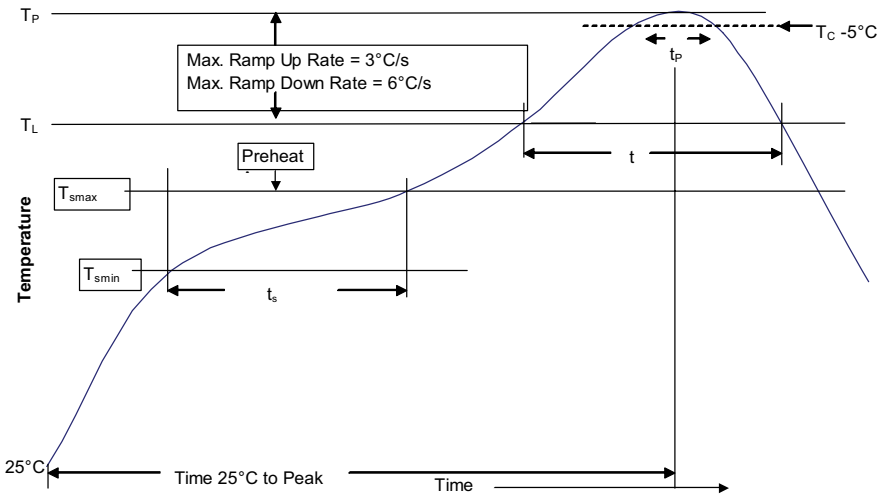


Table 1 - Standard SnPb solder (T_C)

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.

Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics