

5-0SMDJ

5000 W Transient voltage suppressor



Product features

- Low profile SMC package
- Excellent clamping capability
- 5000 W peak pulse power capability at 10/1000 μ s waveform
- Typical I_R less than 1 μ A 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

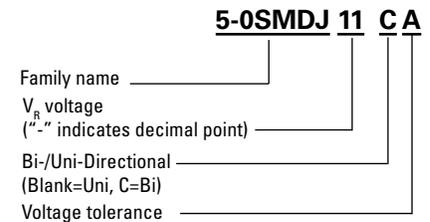
Applications

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

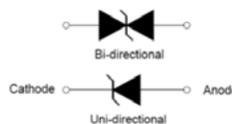
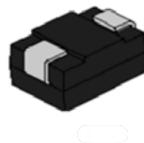
Environmental compliance and general specifications



Ordering part number



PIN configuration



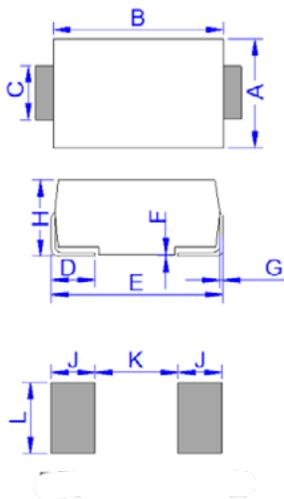
Absolute maximum ratings

(+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}	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



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

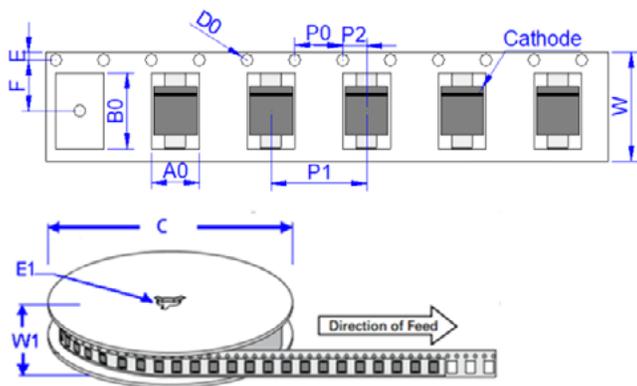


Cathode band (Uni-polar only)
Part marking: xxxx = Date code
yyyy- Refer to marking designator listed in Electrical Characteristics table

Packaging information (mm)

Drawing not to scale.

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



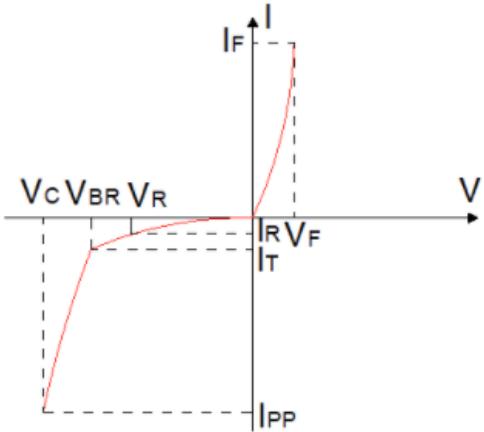
Dimensions	Millimeters	Inches
A0	6.05 ± 0.3	0.238 ± 0.012
B0	8.31 ± 0.3	0.327 ± 0.012
C	330.0	13.0
D0	1.55 ± 0.1	0.061 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3 ± 0.3	0.524 ± 0.012
F	7.50 ± 0.2	0.295 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	8.00 ± 0.2	0.315 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	16.0 ±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

Electrical characteristics (+25 °C)

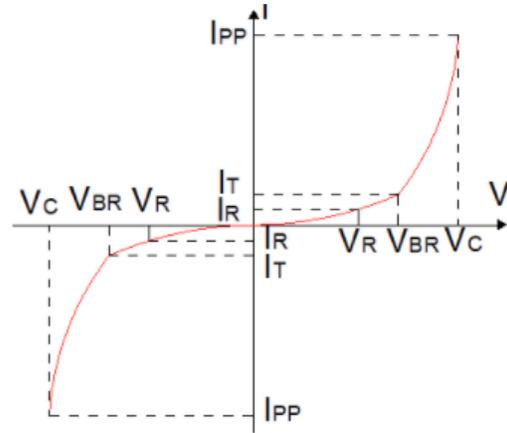
Part number	Uni-polar	Bi-polar	Marking		V_R (V)	$I_R @ V_R$ (μ A)	$V_{BR} @ I_T$ min (V)	max (V)	I_T (mA)	$V_C @ I_{PP}$ max (V)	I_{PP} (A)
			Uni	Bi							
5-0SMDJ11A	5-0SMDJ11CA	5PEN	5BEN	11	5	12.2	13.5	10	18.2	275	
5-0SMDJ12A	5-0SMDJ12CA	5PEP	5BEP	12	5	13.3	14.7	10	19.9	252	
5-0SMDJ13A	5-0SMDJ13CA	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 μ s

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

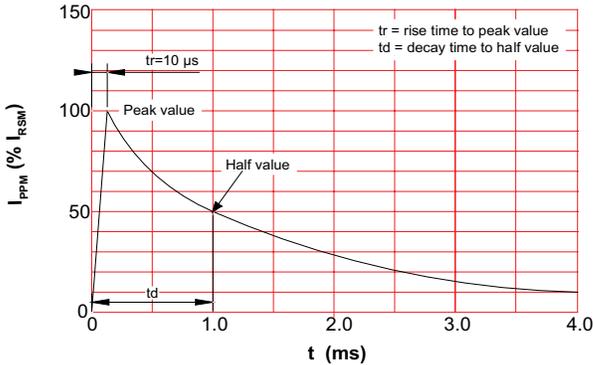
V_{BR} : Breakdown voltage

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

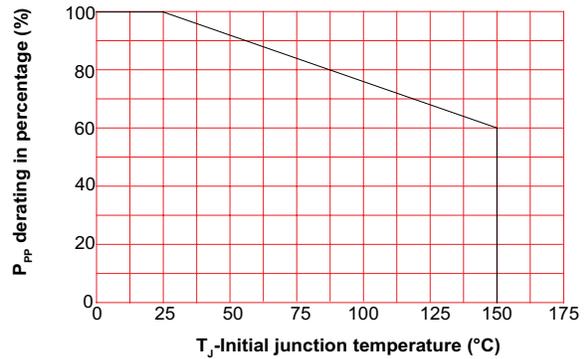
I_R : Reverse leakage current

I_T : Test current

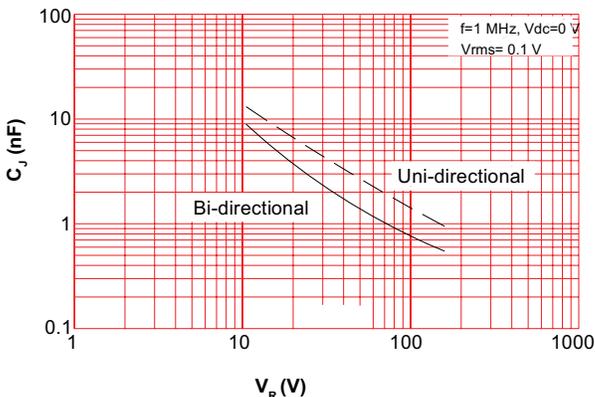
Pulse waveform



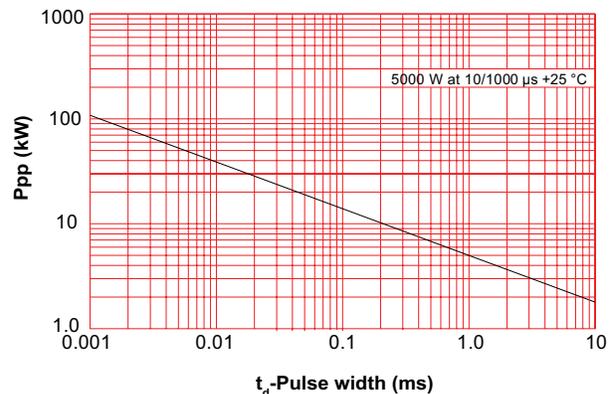
Pulse derating curve



Typical junction capacitance



Peak pulse power dissipation vs. pulse width



Solder reflow profile

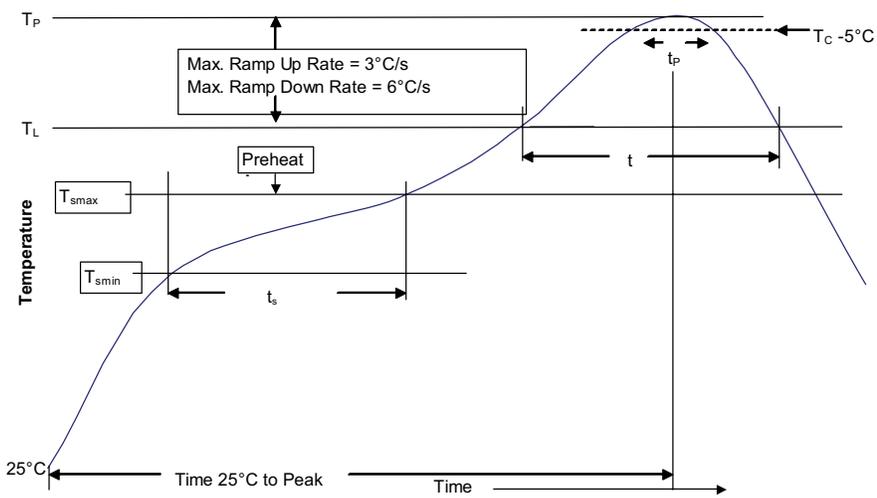


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm^3 <350	Volume mm^3 \geq 350
<2.5 mm	235 °C	220 °C
\geq 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	<ul style="list-style-type: none"> Temperature min. (T_{smin}) Temperature max. (T_{smax}) Time (T_{smin} to T_{smax}) (t_s) 	<ul style="list-style-type: none"> 100 °C 150 °C 60-120 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	<ul style="list-style-type: none"> 183 °C 60-150 seconds 	<ul style="list-style-type: none"> 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.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

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

© 2020 Eaton
All Rights Reserved
Printed in USA
Publication No. 11204 BU-MC20182
November 2020

Eaton is a registered trademark.
All other trademarks are property of their respective owners.

Follow us on social media to get the latest product and support information.

