

# SMDJE

## 3000 W Transient voltage suppressor



### Product features

- Low profile SMC package
- Excellent clamping capability
- 3000 W peak pulse power capability at 10/1000  $\mu$ s waveform
- Typical  $I_R$  less than 1  $\mu$ A above 14 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 QVGO2

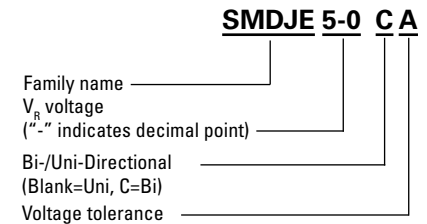
### Applications

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

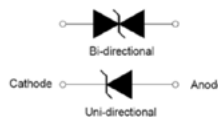
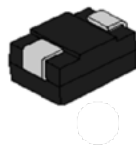
### Environmental compliance and general specifications



### Ordering part number



### PIN configuration



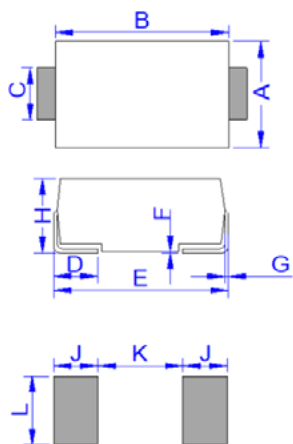
### Absolute maximum ratings

(+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 $\mu$ s waveform	$P_{PP}$	3000	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 <sup>1</sup>	$I_{FSM}$	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



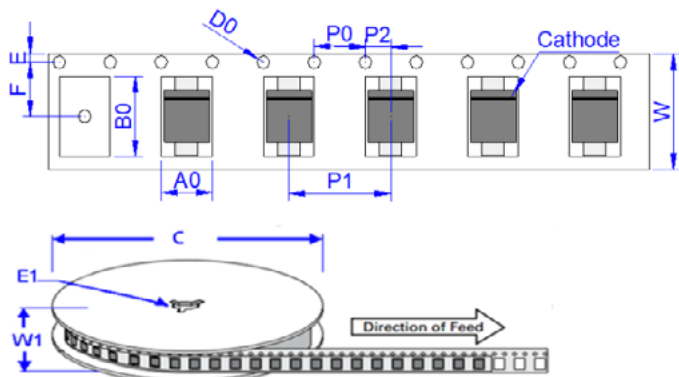
Cathode band (Uni-polar only)

Part marking: xxxx = Date code  
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)



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

**SMDJE**  
3000 W Transient voltage suppressor

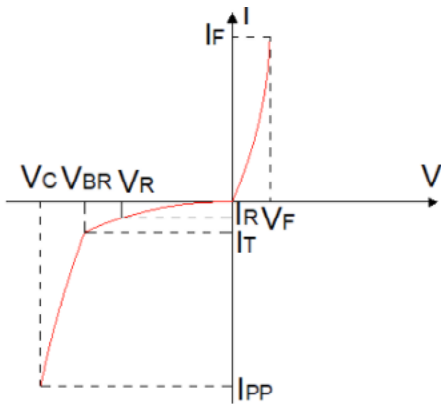
Technical Data 11217  
Effective March 2021

**Electrical characteristics** (+25 °C)

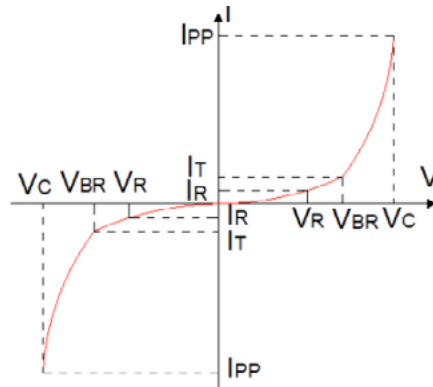
Part number	Bi-polar	Marking		$V_R$ (V)	$I_R @ V_R$ ( $\mu$ A)	$V_{BR} @ I_T$ min (V)	max (V)	$I_T$ (mA)	$V_C @ I_{PP}$ max (V)	$I_{PP}$ (A)
		Uni	Bi							
SMDJE5-0A	SMDJE5-0CA	HDE	IDE	5	800	6.4	7	10	9.2	326.1
SMDJE6-0A	SMDJE6-0CA	HDG	IDG	6	800	6.67	7.37	10	10.3	291.3
SMDJE6-5A	SMDJE6-5CA	HDK	IDK	6.5	500	7.22	7.98	10	11.2	267.9
SMDJE7-0A	SMDJE7-0CA	HDM	IDM	7	200	7.78	8.6	10	12	250
SMDJE7-5A	SMDJE7-5CA	HDP	IDP	7.5	100	8.33	9.21	1	12.9	232.6
SMDJE8-0A	SMDJE8-0CA	HDR	IDR	8	50	8.89	9.83	1	13.6	220.6
SMDJE8-5A	SMDJE8-5CA	HDT	IDT	8.5	20	9.44	10.4	1	14.4	208.3
SMDJE9-0A	SMDJE9-0CA	HDV	IDV	9	10	10	11.1	1	15.4	194.8
SMDJE10A	SMDJE10CA	HDX	IDX	10	5	11.1	12.3	1	17	176.5
SMDJE11A	SMDJE11CA	HDZ	IDZ	11	2	12.2	13.5	1	18.2	164.8
SMDJE12A	SMDJE12CA	HEE	IEE	12	2	13.3	14.7	1	19.9	150.8
SMDJE13A	SMDJE13CA	HEG	IEG	13	2	14.4	15.9	1	21.5	139.5
SMDJE14A	SMDJE14CA	HEK	IEK	14	2	15.6	17.2	1	23.2	129.3
SMDJE15A	SMDJE15CA	HEM	IEM	15	1	16.7	18.5	1	24.4	123
SMDJE16A	SMDJE16CA	HEP	IEM	16	1	17.8	19.7	1	26	115.4
SMDJE17A	SMDJE17CA	HER	IER	17	1	18.9	20.9	1	27.6	108.7
SMDJE18A	SMDJE18CA	HET	IET	18	1	20	22.1	1	29.2	102.7
SMDJE20A	SMDJE20CA	HEV	IEV	20	1	22.2	24.5	1	32.4	92.6
SMDJE22A	SMDJE22CA	HEX	IEX	22	1	24.4	26.9	1	35.5	84.5
SMDJE24A	SMDJE24CA	HEZ	IEZ	24	1	26.7	29.5	1	38.9	77.1
SMDJE26A	SMDJE26CA	HFE	IFE	26	1	28.9	31.9	1	42.1	71.3
SMDJE28A	SMDJE28CA	HFG	IFG	28	1	31.1	34.4	1	45.4	66.1
SMDJE30A	SMDJE30CA	HFK	IFK	30	1	33.3	36.8	1	48.4	62
SMDJE33A	SMDJE33CA	HFM	IFM	33	1	36.7	40.6	1	53.3	56.3
SMDJE36A	SMDJE36CA	HFP	IFP	36	1	40	44.2	1	58.1	51.6
SMDJE40A	SMDJE40CA	HFR	IFR	40	1	44.4	49.1	1	64.5	46.5
SMDJE43A	SMDJE43CA	HFT	IFT	43	1	47.8	52.8	1	69.4	43.2
SMDJE45A	SMDJE45CA	HFV	IFV	45	1	50	55.3	1	72.7	41.3
SMDJE48A	SMDJE48CA	HFX	IFX	48	1	53.3	58.9	1	77.4	38.8
SMDJE51A	SMDJE51CA	HFZ	IFZ	51	1	56.7	62.7	1	82.4	36.4
SMDJE54A	SMDJE54CA	HGE	IGE	54	1	60	66.3	1	87.1	34.4
SMDJE58A	SMDJE58CA	HGG	IGG	58	1	64.4	71.2	1	93.6	32.1
SMDJE60A	SMDJE60CA	HGK	IGK	60	1	66.7	73.7	1	96.8	31
SMDJE64A	SMDJE64CA	HGM	IGM	64	1	71.1	78.6	1	103	29.1
SMDJE70A	SMDJE70CA	HGP	IGP	70	1	77.8	86	1	113	26.5
SMDJE75A	SMDJE75CA	HGR	IGR	75	1	83.3	92.1	1	121	24.8
SMDJE78A	SMDJE78CA	HGT	IGT	78	1	86.7	95.8	1	126	23.8
SMDJE85A	SMDJE85CA	HGV	IGV	85	1	94.4	104	1	137	21.9
SMDJE90A	SMDJE90CA	HGX	IGX	90	1	100	111	1	146	20.5
SMDJE100A	SMDJE100CA	HGZ	IGZ	100	1	111	123	1	162	18.5
SMDJE110A	SMDJE110CA	HHE	IHE	110	1	122	135	1	177	16.9
SMDJE120A	SMDJE120CA	HHG	IHG	120	1	133	147	1	193	15.5
SMDJE130A	SMDJE130CA	HHK	IHK	130	1	144	159	1	209	14.4
SMDJE150A	SMDJE150CA	HHM	IHM	150	1	167	185	1	243	12.3
SMDJE160A	SMDJE160CA	HHP	IHP	160	1	178	197	1	259	11.6
SMDJE170A	SMDJE170CA	HHR	IHR	170	1	189	209	1	275	10.9
SMDJE180A	SMDJE180CA	HHT	IHT	180	1	201	222	1	292	10.3
SMDJE190A	SMDJE190CA	HHV	IHV	190	1	211	234	1	307	9.7
SMDJE200A	SMDJE200CA	HHX	IHX	200	1	224	247	1	324	9.3
SMDJE210A	SMDJE210CA	HHZ	IHZ	210	1	233	258	1	337	8.8
SMDJE220A	SMDJE220CA	HIE	IIE	220	1	244	270	1	356	8.4

**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

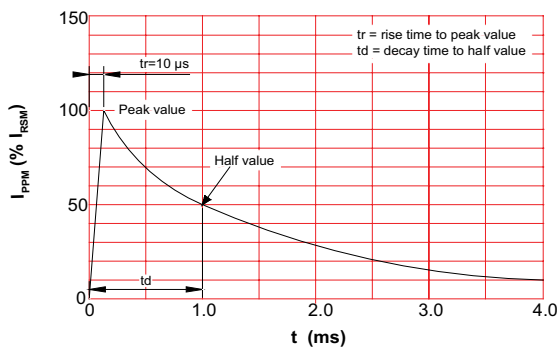
$V_C$ : Clamping voltage – Peak voltage measured across the suppressor at a specified  $I_{PP}$

$I_R$ : Reverse leakage current

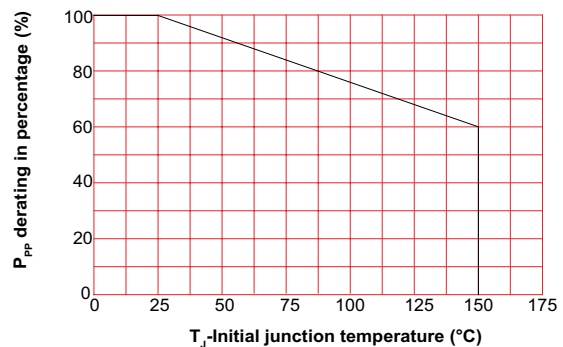
$I_T$ : Test current

$V_F$ : Forward voltage drop for Uni-directional TVS diode

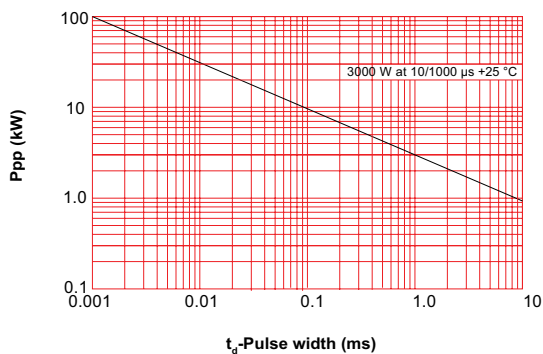
**Pulse waveform**



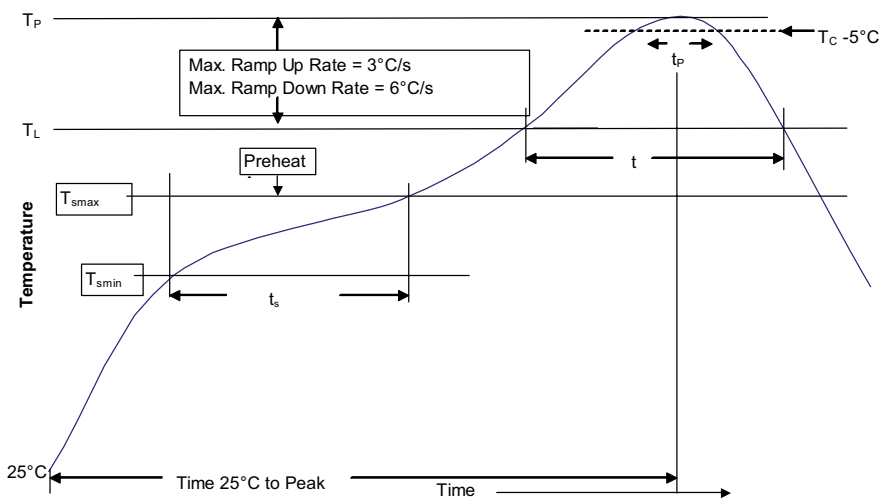
**Pulse derating curve**



**Peak pulse power dissipation vs. pulse width**



**Solder reflow profile**



**Table 1 - Standard SnPb solder (T<sub>C</sub>)**

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<sub>C</sub>)**

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	<ul style="list-style-type: none"> <li>Temperature min. (T<sub>smin</sub>)</li> <li>Temperature max. (T<sub>smax</sub>)</li> <li>Time (T<sub>smin</sub> to T<sub>smax</sub>) (t<sub>s</sub>)</li> </ul>	<ul style="list-style-type: none"> <li>100 °C</li> <li>150 °C</li> <li>60-120 seconds</li> </ul>
Ramp up rate T <sub>L</sub> to T <sub>p</sub>	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T <sub>L</sub> )	183 °C	217 °C
Time (t <sub>L</sub> ) maintained above T <sub>L</sub>	60-150 seconds	60-150 seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )* within 5 °C of the specified classification temperature (T <sub>C</sub> )	20 seconds*	40 seconds*
Ramp-down rate (T <sub>p</sub> to T <sub>L</sub> )	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<sub>p</sub>) is defined as a supplier minimum and a user maximum.

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

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