

Together We Make It Safe!



Transient Voltage Suppressor (TVS)





Transient Voltage Suppressor (TVS) 5.0SMDJ

- Surface Mount
- 5000W

Features

- Glass Passivated Chip
- Uni and Bidirectional Unit
- Low Leakage
- Excellent clamping capability
- Fast response time
- Plastic material U/L 94V-0 recognized
- Reverse Voltage – 12 to 170 V
- Power Dissipation - 5000 W

Applications

- Automotive Electronics
- Telecom
- Lightning Protection Module
- Security Switching Power Supply
- Industrial Controller
- Inverter
- Renewable Energy Solar/Wind

Maximum Ratings and Thermal Characteristics

Parameter	Symbol	Value	Unit
Peak Power Dissipation At $T_A = 25^\circ\text{C}$ $T_p=10/1000\mu\text{s}$ Waveform ³	P_{PK}	5000	W
Power Dissipation on Infinite Heat Sink at $T_A=50^\circ\text{C}$ ⁴	$P_{M(AV)}$	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave ⁵	I_F	300	A
Maximum Instantaneous forward voltage at 25A for unidirectional devices only ⁶	V_F	3.5/5.0	V
Storage Temperature Range	T_{STG}	-50~150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-50~150	$^\circ\text{C}$

Note:

1. Ratings at 25°C ambient temperature unless otherwise specified.
2. Single phase, half wave, 60Hz, resistive or inductive load.
3. Non-repetitive current pulse@10/1000 μs and derated above $T_A=25^\circ\text{C}$
4. Mounted on 5.0x5.0mm copper pad to each terminal.
5. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.
6. $V_F < 3.5\text{V}$ for $V_{BR} \leq 200\text{V}$ and $V_F < 6.5\text{V}$ for $V_{BR} \geq 201\text{V}$.

Product Identification

5.0SMDJ XXX A or CA
 (1) (2) (3) (4)

(1) Product Code (2) Reverse Standoff Voltage V_{RM} (3) Unidirectional (4) Bidirectional

Transient Voltage Suppressor (TVS) 5.0SMDJ

● Surface Mount ● 5000W

Electrical Characteristics

Part Number		Part Marking		$V_{BR}^{(1)}@I_T$		$I_T^{(2)}$	$V_{RM}^{(3)}$	Max $I_R^{(4)}$ @ V_{RM}	Max $V_C^{(5)}$	Max $I_{PP}^{(6)}$
Uni	Bi	Uni	Bi	MIN(V)	MAX(V)	mA	V	μA	V	A
5.0SMDJ12A	5.0SMDJ12CA	5PEP	5BEP	13.3	14.7	10	12	800	19.9	252
5.0SMDJ13A	5.0SMDJ13CA	5PEQ	5BEQ	14.4	15.9	10	13	500	21.5	233
5.0SMDJ14A	5.0SMDJ14CA	5PER	5BER	15.6	17.2	10	14	200	23.2	216
5.0SMDJ15A	5.0SMDJ15CA	5PES	5BES	16.7	18.5	1	15	100	24.4	205
5.0SMDJ16A	5.0SMDJ16CA	5PET	5BET	17.8	19.7	1	16	50	26	193
5.0SMDJ17A	5.0SMDJ17CA	5PEU	5BEU	18.9	20.9	1	17	20	27.6	181
5.0SMDJ18A	5.0SMDJ18CA	5PEV	5BEV	20	22.1	1	18	10	29.2	172
5.0SMDJ20A	5.0SMDJ20CA	5PEW	5BEW	22.2	24.5	1	20	5	32.4	155
5.0SMDJ22A	5.0SMDJ22CA	5PEX	5BEX	24.4	26.9	1	22	5	35.5	141
5.0SMDJ24A	5.0SMDJ24CA	5PEZ	5BEZ	26.7	29.5	1	24	5	38.9	129
5.0SMDJ26A	5.0SMDJ26CA	5PFE	5BFE	28.9	31.9	1	26	5	42.1	119
5.0SMDJ28A	5.0SMDJ28CA	5PFG	5BFG	31.1	34.4	1	28	5	45.4	110
5.0SMDJ30A	5.0SMDJ30CA	5PFK	5BFK	33.3	36.8	1	30	5	48.4	103
5.0SMDJ33A	5.0SMDJ33CA	5PFM	5BFM	36.7	40.6	1	33	5	53.3	93.9
5.0SMDJ36A	5.0SMDJ36CA	5PFP	5BFP	40	44.2	1	36	5	58.1	86.1
5.0SMDJ40A	5.0SMDJ40CA	5PFR	5BFR	44.4	49.1	1	40	5	64.5	77.6
5.0SMDJ43A	5.0SMDJ43CA	5PFT	5BFT	47.8	52.8	1	43	5	69.4	72.1
5.0SMDJ45A	5.0SMDJ45CA	5PFV	5BFV	50	55.3	1	45	5	72.7	68.8
5.0SMDJ48A	5.0SMDJ48CA	5PFX	5BFX	53.3	58.9	1	48	5	77.4	64.7
5.0SMDJ51A	5.0SMDJ51CA	5PFZ	5BFZ	56.7	62.7	1	51	5	82.4	60.7
5.0SMDJ54A	5.0SMDJ54CA	5PGE	5BGE	60	66.3	1	54	5	87.1	57.5
5.0SMDJ58A	5.0SMDJ58CA	5PGG	5BGG	64.4	71.2	1	58	5	93.6	53.5
5.0SMDJ60A	5.0SMDJ60CA	5PGK	5BGK	66.7	73.7	1	60	5	96.8	51.7
5.0SMDJ64A	5.0SMDJ64CA	5PGM	5BGM	71.1	78.6	1	64	5	103	48.6
5.0SMDJ70A	5.0SMDJ70CA	5PGP	5BGP	77.8	86	1	70	5	113	44.3
5.0SMDJ75A	5.0SMDJ75CA	5PGR	5BGR	83.3	92.1	1	75	5	121	41.4
5.0SMDJ78A	5.0SMDJ78CA	5PGT	5BGT	86.7	95.8	1	78	5	126	39.7
5.0SMDJ85A	5.0SMDJ85CA	5PGV	5BGV	94.4	104	1	85	5	137	36.5
5.0SMDJ90A	5.0SMDJ90CA	5PGX	5BGX	100	111	1	90	5	146	34.3
5.0SMDJ100A	5.0SMDJ100C	5PGZ	5BGZ	111	123	1	100	5	162	30.9
5.0SMDJ110A	5.0SMDJ110C	5PHE	5BHE	122	135	1	110	5	177	28.3
5.0SMDJ120A	5.0SMDJ120C	5PHG	5BHG	133	147	1	120	5	193	26
5.0SMDJ130A	5.0SMDJ130C	5PHK	5BHK	144	159	1	130	5	209	24
5.0SMDJ150A	5.0SMDJ150C	5PHM	5BHM	167	185	1	150	5	243	20.6

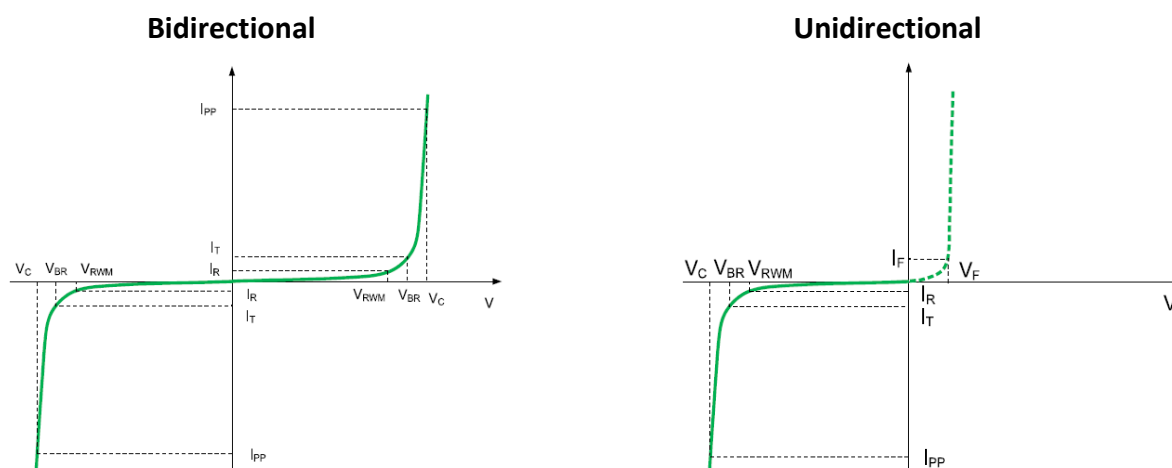
Transient Voltage Suppressor (TVS) 5.0SMDJ

● Surface Mount ● 5000W

Part Number		Part Marking		$V_{BR}^{(1)}$ @ I_T		$I_T^{(2)}$	$V_{RM}^{(3)}$	Max $I_R^{(4)}$ @ V_{RM}	Max $V_C^{(5)}$	Max $I_{PP}^{(6)}$
Uni	Bi	Uni	Bi	MIN(V)	MAX(V)	mA	V	μA	V	A
5.0SMDJ160A	5.0SMDJ160C	5PHP	5BHB	178	197	1	160	5	259	19.3
5.0SMDJ170A	5.0SMDJ170C	5PHR	5BHR	189	209	1	170	5	275	18.2

For bidirectional type having V_R of 10 volts and less, the I_R limit is double.

I-V Curve Characteristics



Symbol	Parameter	Explanation
(1) V_{BR}	Breakdown voltage	The Voltage that flows though the TVS at a specified test current (I_T)
(2) I_T	Test current	A specified test current that flows though the TVS
(3) V_{RM}	Stand-off voltage	Maximum voltage that can be applied to the TVS without operation
(4) I_R	Leakage current @ V_R	Current measured at V_R
(5) V_C	Clamping voltage	Peak voltage measured across the suppressor at a specified I_{pp} (peak impulse current)
(6) I_{PP}	Peak pulse current	The maximum surge current that flows though the TVS

Transient Voltage Suppressor (TVS) 5.0SMDJ

● Surface Mount ● 5000W

Fig1. Pulse Waveform

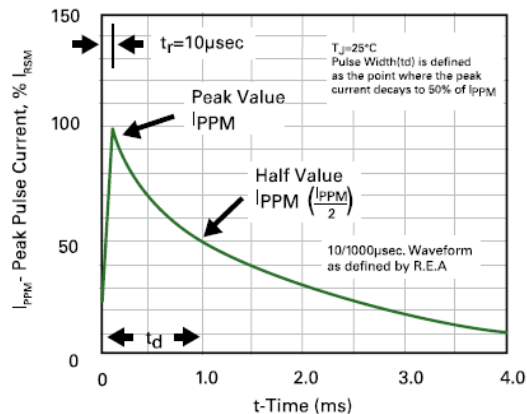


Fig2. Pulse Derating Curve

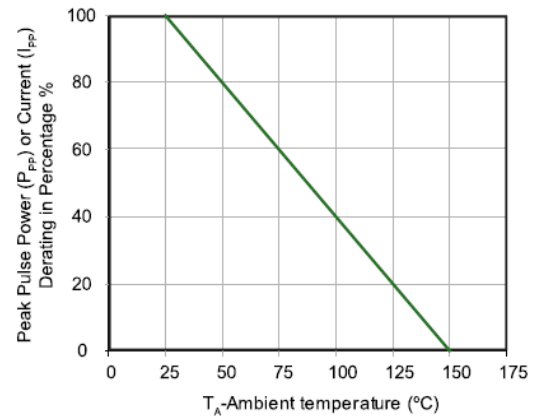


Figure 3. Steady Power Dissipation Derating Curve

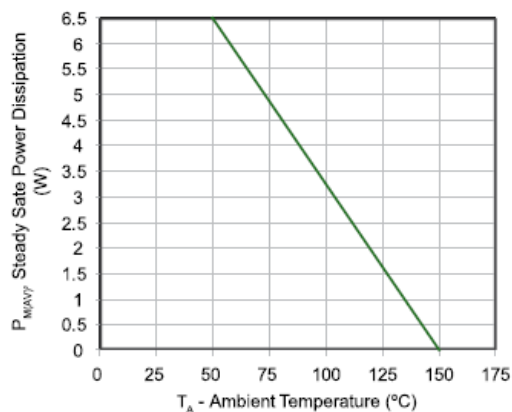


Figure 4. Peak Pulse Power Rating Curve

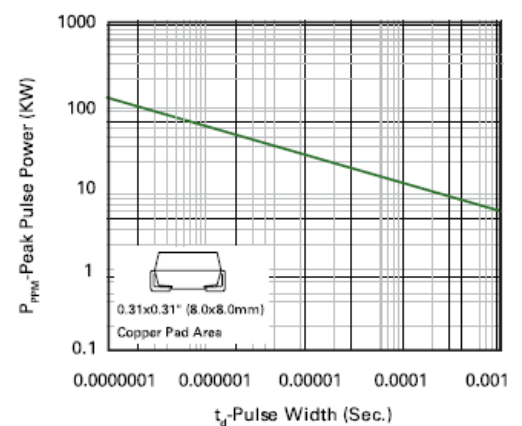
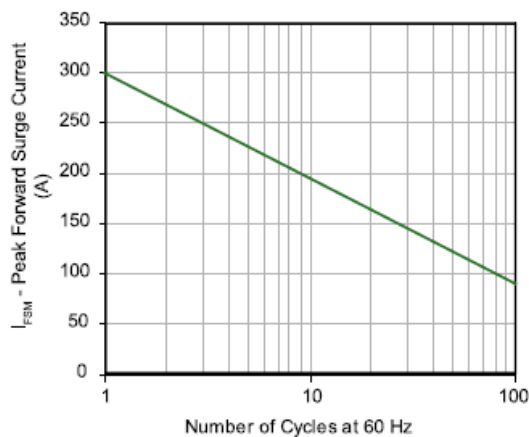


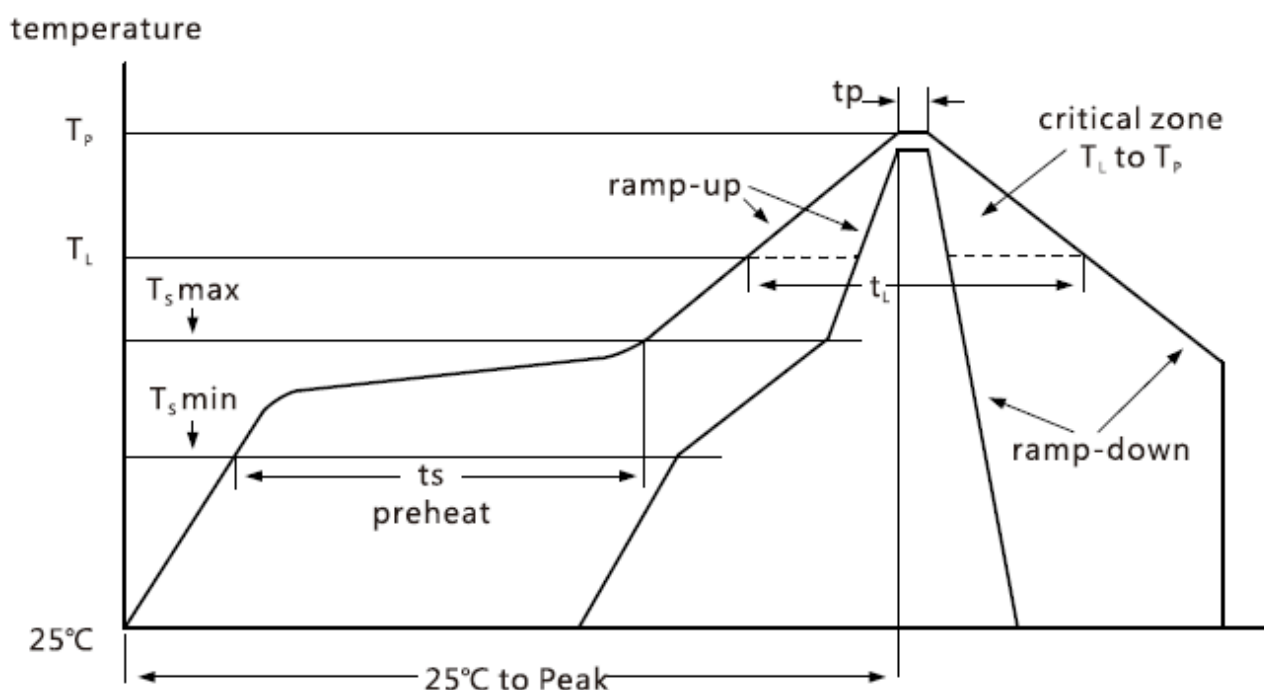
Figure 5. Maximum Non-Repetitive Surge Current



Transient Voltage Suppressor (TVS) 5.0SMDJ

● Surface Mount ● 5000W

Reflow Soldering Profile

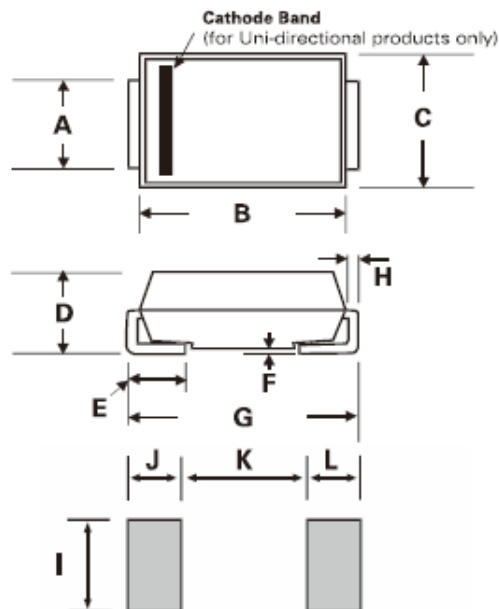


Reflow Profile Feature	SnPb eutectic assembly	Pb-free assembly
Average ramp-up rate (T_s max to T_p)	3°C/s maximum	3°C/s maximum
Preheat		
Temperature minimum (T_s min)	100°C	150°C
Temperature maximum (T_s max)	150°C	200°C
Time (T_s min to T_s max)	60 s to 120 s	60 s to 180 s
Time maintained above		
Temperature (T_L)	183°C	217°C
Time (t_L)	60 s to 150 s	60 s to 150 s
Peak/classification temperature (T_p)	235°C	260°C
Number of allowed reflow cycles	3	3
Time within 5 °C of actual peak temperature (t_p)	10 s to 30 s	10 s to 30 s
Ramp-down rate	6°C/s maximum	6°C/s maximum
Time 25 °C to peak temperature	6 minutes maximum	8 minutes maximum

Transient Voltage Suppressor (TVS) 5.0SMDJ

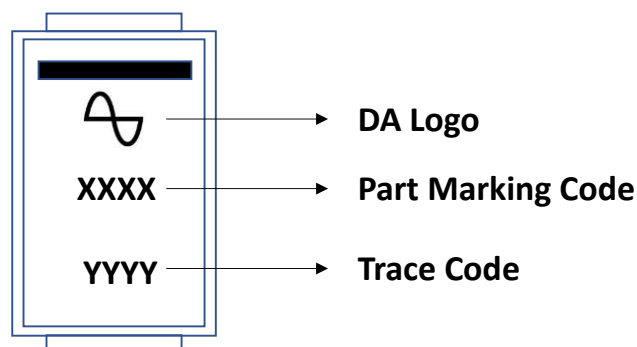
● Surface Mount ● 5000W

Package and Layout Dimensions (DO-214AB / SMC)



Dimension	Inches		Millimeters	
	Min	Max	Min	Max
A	0.11	0.126	2.8	3.2
B	0.26	0.28	6.6	7.11
C	0.22	0.245	5.59	6.22
D	0.079	0.114	2.06	2.95
E	0.03	0.063	0.76	1.6
F	-	0.008	-	0.203
G	0.305	0.32	7.75	8.13
H	0.006	0.012	0.15	0.305
I	0.129	-	3.3	-
J	0.094	-	2.4	-
K	-	0.165	4.2	-
L	0.094	-	2.4	-

Product Marking



Packaging

Part	Component Package	Quantity	Packaging Option
5.0SMDJ-XXX-A/CA	SMC	500pcs	7" REEL
5.0SMDJ-XXX-A/CA	SMC	3,000pcs	13" REEL