

## Transient Voltage Suppression Diodes Surface Mount – 1500W

### Descriptions

Transient Voltage Suppressors (TVS) are semiconductor devices designed to provide protection against over voltage transients. When over voltage events occur, the silicon TVS activates from an very high impedance status to a very low impedance status by operating in the avalanche mode and uses a large junction area to absorb large transient currents in a fast response time, protecting voltage sensitive electronics equipment from damaging.

Boarden supplies unipolar and bipolar TVS devices with axial and SMD packages, with maximum working voltage 5V to 550V, maximum power dissipation from 200W-5000W.



**SMC  
(JEDEC DO-214AB)**

### Features

- Glass passivated chip junction in SMC Package
- 1500W peak pulse power @10/1000 $\mu$ s
- Typical  $I_R$  less than 1 $\mu$ A above 13V
- Low incremental surge resistance
- Excellent clamping capability
- Typical failure mode is short from over-specified voltage/ current
- Fast response time: typically less than 1.0ps from 0V to BV min
- EFT protection of data lines in accordance with IEC 61000-4-4
- UL94V-0 Flammability Rating
- Halogen free and RoHS compliant

### Applications

- Telecom and Network
- Industrial Products
- Business Machines
- Vehicles Electronics
- Power Adapter
- Consumer Products
- Security Protection

### Maximum Ratings and Thermal Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000 $\mu$ s Test Waveform	$P_{PPM}$	1500	W
Steady State Power Dissipation on Infinite Heat Sink at $T_L=75^\circ\text{C}$	$P_D$	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only <sup>(1)</sup>	$I_{FSM}$	200	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only <sup>(2)</sup>	$V_F$	3.5/5.0	V
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 175	$^\circ\text{C}$
Typical Thermal Resistance Junction to Lead	$R_{uJL}$	15	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Ambient	$R_{uJA}$	75	$^\circ\text{C/W}$

**Notes:**

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

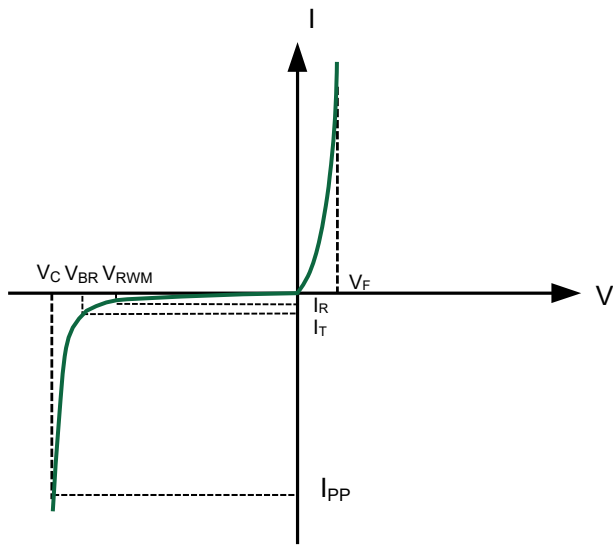
2)  $V_F < 3.5V$  for devices of  $V_{BR} \leq 200V$  and  $V_F < 5.0V$  for devices of  $V_{BR} \geq 201V$ .

**Electrical Characteristics (TA=25°C unless otherwise noted)**

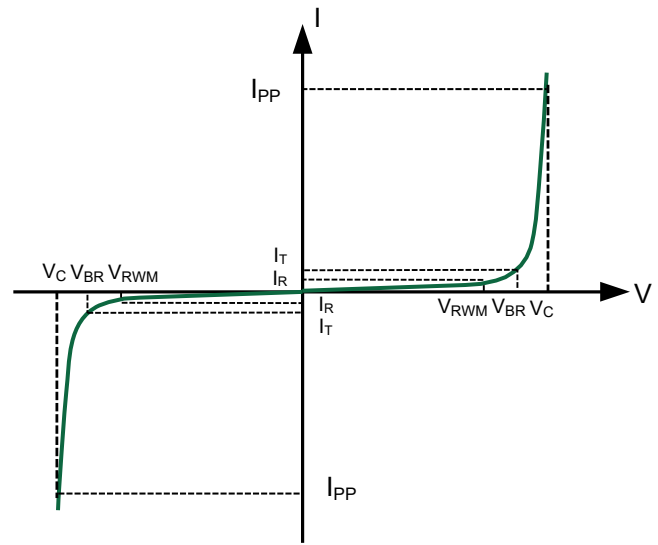
Type Number		V <sub>RMW</sub>	I <sub>R</sub> @V <sub>RMW</sub>	V <sub>BR</sub> @I <sub>T</sub> (V)			I <sub>T</sub>	V <sub>C</sub> @I <sub>PP</sub>	I <sub>PP</sub> MAX
Uni	Bi	(V)	(μA)	Min	Nom	Max	(mA)	(V)	(A)
SMCJ5.0A	SMCJ5.0CA	5.0	800	6.40	6.70	7.00	10	9.2	163.0
SMCJ6.0A	SMCJ6.0CA	6.0	800	6.67	7.02	7.37	10	10.3	145.7
SMCJ6.5A	SMCJ6.5CA	6.5	500	7.22	7.60	7.98	10	11.2	134.0
SMCJ7.0A	SMCJ7.0CA	7.0	200	7.78	8.19	8.60	10	12.0	125.0
SMCJ7.5A	SMCJ7.5CA	7.5	100	8.33	8.77	9.21	1	12.9	116.3
SMCJ8.0A	SMCJ8.0CA	8.0	50	8.89	9.36	9.83	1	13.6	110.3
SMCJ8.5A	SMCJ8.5CA	8.5	20	9.44	9.92	10.4	1	14.4	104.2
SMCJ9.0A	SMCJ9.0CA	9.0	10	10.0	10.6	11.1	1	15.4	97.4
SMCJ10A	SMCJ10CA	10	5	11.1	11.7	12.3	1	17.0	88.3
SMCJ11A	SMCJ11CA	11	1	12.2	12.9	13.5	1	18.2	82.5
SMCJ12A	SMCJ12CA	12	1	13.3	14.0	14.7	1	19.9	75.4
SMCJ13A	SMCJ13CA	13	1	14.4	15.2	15.9	1	21.5	69.8
SMCJ14A	SMCJ14CA	14	1	15.6	16.4	17.2	1	23.2	64.7
SMCJ15A	SMCJ15CA	15	1	16.7	17.6	18.5	1	24.4	61.5
SMCJ16A	SMCJ16CA	16	1	17.8	18.8	19.7	1	26.0	57.7
SMCJ17A	SMCJ17CA	17	1	18.9	19.9	20.9	1	27.6	54.4
SMCJ18A	SMCJ18CA	18	1	20.0	21.1	22.1	1	29.2	51.4
SMCJ20A	SMCJ20CA	20	1	22.2	23.4	24.5	1	32.4	46.3
SMCJ22A	SMCJ22CA	22	1	24.4	25.7	26.9	1	35.5	42.3
SMCJ24A	SMCJ24CA	24	1	26.7	28.1	29.5	1	38.9	38.6
SMCJ26A	SMCJ26CA	26	1	28.9	30.4	31.9	1	42.1	35.7
SMCJ28A	SMCJ28CA	28	1	31.1	32.8	34.4	1	45.4	33.1
SMCJ30A	SMCJ30CA	30	1	33.3	35.1	36.8	1	48.4	31.0
SMCJ33A	SMCJ33CA	33	1	36.7	38.7	40.6	1	53.3	28.2
SMCJ36A	SMCJ36CA	36	1	40.0	42.1	44.2	1	58.1	25.9
SMCJ40A	SMCJ40CA	40	1	44.4	46.8	49.1	1	64.5	23.3
SMCJ43A	SMCJ43CA	43	1	47.8	50.3	52.8	1	69.4	21.7
SMCJ45A	SMCJ45CA	45	1	50.0	52.7	55.3	1	72.7	20.6
SMCJ48A	SMCJ48CA	48	1	53.3	56.1	58.9	1	77.4	19.4
SMCJ51A	SMCJ51CA	51	1	56.7	59.7	62.7	1	82.4	18.2
SMCJ54A	SMCJ54CA	54	1	60.0	63.2	66.3	1	87.1	17.3
SMCJ58A	SMCJ58CA	58	1	64.4	67.8	71.2	1	93.6	16.1
SMCJ60A	SMCJ60CA	60	1	66.7	70.2	73.7	1	96.8	15.5
SMCJ64A	SMCJ64CA	64	1	71.1	74.9	78.6	1	103	14.6
SMCJ70A	SMCJ70CA	70	1	77.8	81.9	86.0	1	113	13.3
SMCJ75A	SMCJ75CA	75	1	83.3	87.7	92.1	1	121	12.4
SMCJ78A	SMCJ78CA	78	1	86.7	91.3	95.8	1	126	11.9
SMCJ85A	SMCJ85CA	85	1	94.4	99.2	104	1	137	11.0
SMCJ90A	SMCJ90CA	90	1	100	105.5	111	1	146	10.3
SMCJ100A	SMCJ100CA	100	1	111	117.0	123	1	162	9.3
SMCJ110A	SMCJ110CA	110	1	122	128.5	135	1	177	8.5
SMCJ120A	SMCJ120CA	120	1	133	140.0	147	1	193	7.8
SMCJ130A	SMCJ130CA	130	1	144	151.5	159	1	209	7.2
SMCJ150A	SMCJ150CA	150	1	167	176.0	185	1	243	6.2
SMCJ160A	SMCJ160CA	160	1	178	187.5	197	1	259	5.8
SMCJ170A	SMCJ170CA	170	1	189	199.0	209	1	275	5.5
SMCJ180A	SMCJ180CA	180	1	201	211.5	222	1	292	5.1
SMCJ200A	SMCJ200CA	200	1	224	235.5	247	1	324	4.6
SMCJ220A	SMCJ220CA	220	1	246	259.0	272	1	356	4.2
SMCJ250A	SMCJ250CA	250	1	279	294.0	309	1	405	3.7
SMCJ300A	SMCJ300CA	300	1	335	353.0	371	1	486	3.1
SMCJ350A	SMCJ350CA	350	1	391	411.5	432	1	567	2.6
SMCJ400A	SMCJ400CA	400	1	447	470.5	494	1	648	2.3
SMCJ440A	SMCJ440CA	440	1	492	517.5	543	1	713	2.1

For bidirectional type having V<sub>RMW</sub> of 10 volts and less, the I<sub>R</sub> limit is double.

I-V Curve Characteristics



Uni-Directional TVS



Bi-Directional TVS

$V_{RWM}$  - Reverse Stand-Off Voltage - Working Peak Reverse Voltage

$V_{BR}$  - Breakdown Voltage - Maximum current that flows through the TVS at a specified test current ( $I_T$ )

$I_T$  - Test Current - Test Current

$V_C$  - Clamping Voltage - Peak voltage measured across the suppressor at a specified  $I_{ppm}$  (peak impulse current)

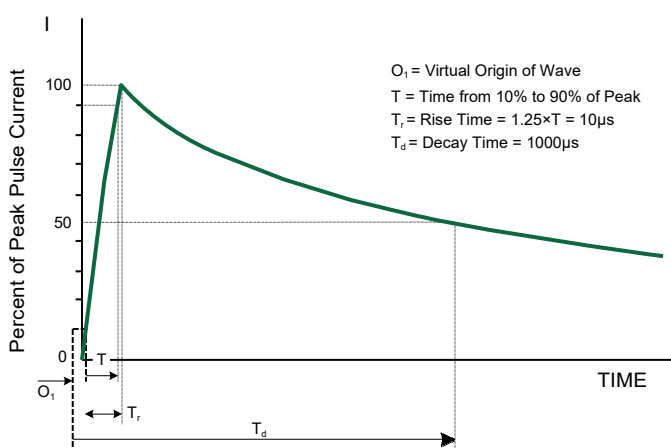
$I_{PP}$  - Peak Pulse Current - Maximum Reverse Peak Pulse Current

$P_{PPM}$  - Peak Pulse Power Dissipation - Max power dissipation

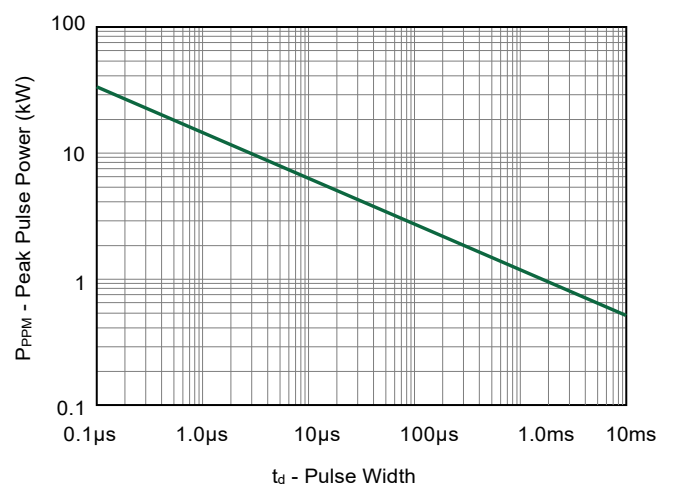
$I_R$  - Reverse Leakage Current - Current measured at  $V_{RWM}$

$V_F$  - Forward Voltage - Drop for Uni-directional

Ratings and Characteristic Curves (TA=25°C unless otherwise noted)

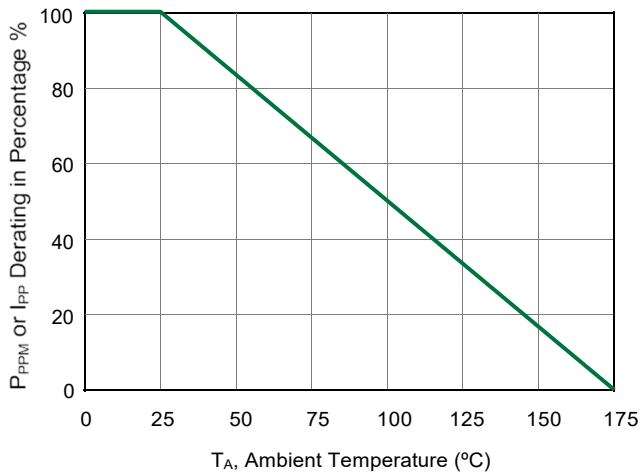


Pulse Waveform- 10/1000µs

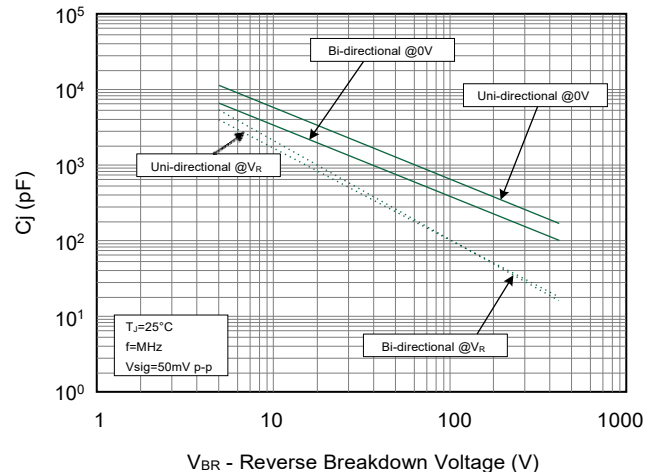


Peak Pulse Power Rating Curve

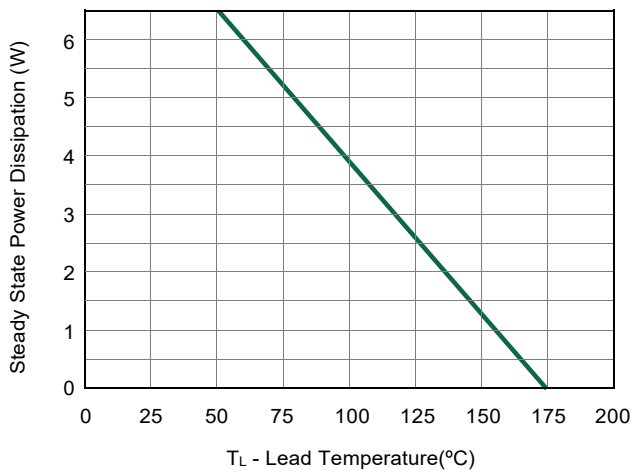
## Ratings and Characteristic Curves (TA=25°C unless otherwise noted)



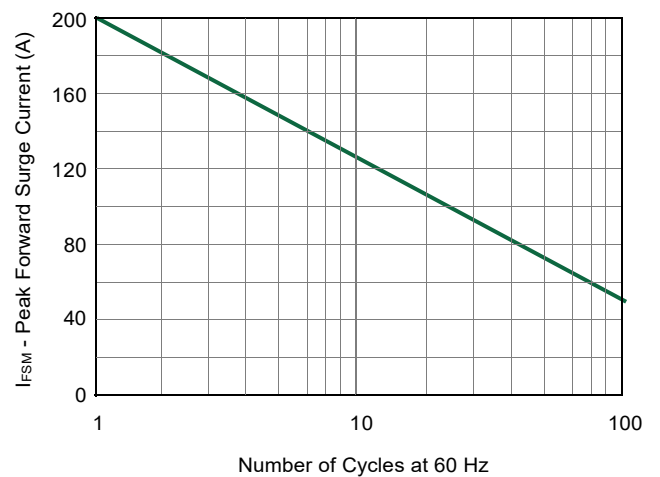
**Pulse Derating Curve**



**Typical Junction Capacitance**



**Steady State Power Derating Curve**



**Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only**

## Product Dimensions

Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.108	0.128	2.750	3.250
B	0.260	0.291	6.600	7.400
C	0.220	0.246	5.590	6.250
D	0.078	0.116	1.98	2.95
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.303	0.323	7.700	8.200
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	2.400	-
K	-	0.165	-	4.200
L	0.094	-	2.400	-

