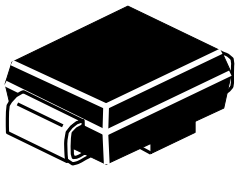
Transient Voltage Suppression Diodes
Surface Mount – 1500W

Descriptions

Transient Voltage Suppressors (TVS) are semiconductor devices designed to provide protection against over voltage transients. When over voltage events occur, the silicon TVS actives 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 @10/1000μs
- Typical I_R less than 1μA 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 10/1000μs Test Waveform	P_{PPM}	1500	W
Steady State Power Dissipation on Infinite Heat Sink at T_L=75°C	P_D	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only (1)	I_{FSM}	200	A
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only (2)	V_F	3.5/5.0	V
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C
Typical Thermal Resistance Junction to Lead	R_{uJL}	15	°C/W
Typical Thermal Resistance Junction to Ambient	R_{uJA}	75	°C/W

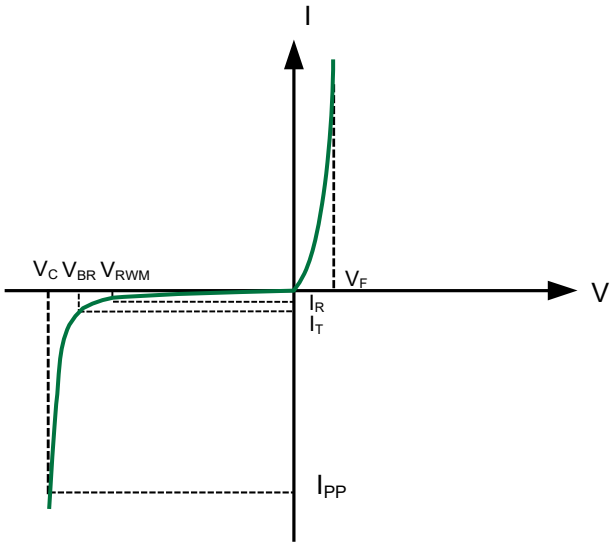
Notes:
1) Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.
2) V_F<3.5V for devices of $V_{BR} \leqslant$200V and V_F<5.0V for devices of $V_{BR} \geqslant$201V.

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

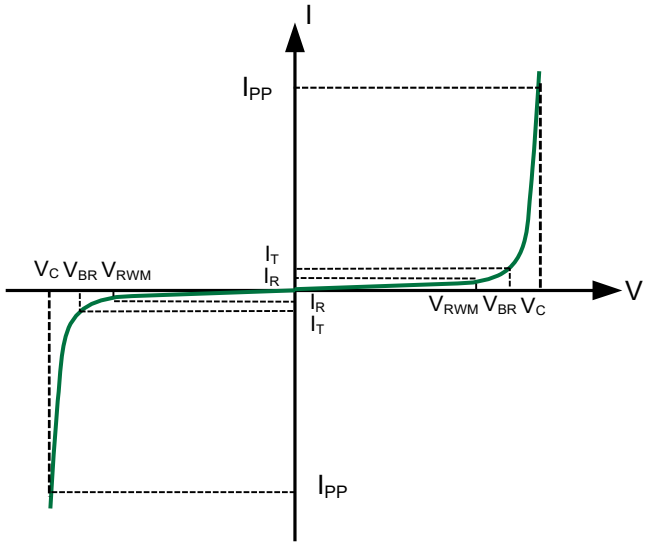
Type Number		V_{RMW}	I_R @V_{RMW}	V_{BR} @I_T (V)			I_T	V_C @I_{PP}	I_{PP} MAX
Uni	Bi	(V)	(μA)	Min	Nom	Max	(mA)	(V)	(A)
1.5SMCJ5.0A	1.5SMCJ5.0CA	5.0	800	6.40	6.70	7.00	10	9.2	163.0
1.5SMCJ6.0A	1.5SMCJ6.0CA	6.0	800	6.67	7.02	7.37	10	10.3	145.7
1.5SMCJ6.5A	1.5SMCJ6.5CA	6.5	500	7.22	7.60	7.98	10	11.2	134.0
1.5SMCJ7.0A	1.5SMCJ7.0CA	7.0	200	7.78	8.19	8.60	10	12.0	125.0
1.5SMCJ7.5A	1.5SMCJ7.5CA	7.5	100	8.33	8.77	9.21	1	12.9	116.3
1.5SMCJ8.0A	1.5SMCJ8.0CA	8.0	50	8.89	9.36	9.83	1	13.6	110.3
1.5SMCJ8.5A	1.5SMCJ8.5CA	8.5	20	9.44	9.92	10.40	1	14.4	104.2
1.5SMCJ9.0A	1.5SMCJ9.0CA	9.0	10	10.00	10.60	11.10	1	15.4	97.4
1.5SMCJ10A	1.5SMCJ10CA	10	5	11.10	11.70	12.30	1	17.0	88.3
1.5SMCJ11A	1.5SMCJ11CA	11	1	12.20	12.90	13.50	1	18.2	82.5
1.5SMCJ12A	1.5SMCJ12CA	12	1	13.30	14.00	14.70	1	19.9	75.4
1.5SMCJ13A	1.5SMCJ13CA	13	1	14.40	15.20	15.90	1	21.5	69.8
1.5SMCJ14A	1.5SMCJ14CA	14	1	15.60	16.40	17.20	1	23.2	64.7
1.5SMCJ15A	1.5SMCJ15CA	15	1	16.70	17.60	18.50	1	24.4	61.5
1.5SMCJ16A	1.5SMCJ16CA	16	1	17.80	18.80	19.70	1	26.0	57.7
1.5SMCJ17A	1.5SMCJ17CA	17	1	18.90	19.90	20.90	1	27.6	54.4
1.5SMCJ18A	1.5SMCJ18CA	18	1	20.00	21.10	22.10	1	29.2	51.4
1.5SMCJ20A	1.5SMCJ20CA	20	1	22.20	23.40	24.50	1	32.4	46.3
1.5SMCJ22A	1.5SMCJ22CA	22	1	24.40	25.70	26.90	1	35.5	42.3
1.5SMCJ24A	1.5SMCJ24CA	24	1	26.70	28.10	29.50	1	38.9	38.6
1.5SMCJ26A	1.5SMCJ26CA	26	1	28.90	30.40	31.90	1	42.1	35.7
1.5SMCJ28A	1.5SMCJ28CA	28	1	31.10	32.80	34.40	1	45.4	33.1
1.5SMCJ30A	1.5SMCJ30CA	30	1	33.30	35.10	36.80	1	48.4	31.0.
1.5SMCJ33A	1.5SMCJ33CA	33	1	36.70	38.70	40.60	1	53.3	28.2
1.5SMCJ36A	1.5SMCJ36CA	36	1	40.00	42.10	44.20	1	58.1	25.9
1.5SMCJ40A	1.5SMCJ40CA	40	1	44.40	46.80	49.10	1	64.5	23.3
1.5SMCJ43A	1.5SMCJ43CA	43	1	47.80	50.30	52.80	1	69.4	21.7
1.5SMCJ45A	1.5SMCJ45CA	45	1	50.00	52.70	55.30	1	72.7	20.6
1.5SMCJ48A	1.5SMCJ48CA	48	1	53.30	56.10	58.90	1	77.4	19.4
1.5SMCJ51A	1.5SMCJ51CA	51	1	56.70	59.70	62.70	1	82.4	18.2
1.5SMCJ54A	1.5SMCJ54CA	54	1	60.00	63.20	66.30	1	87.1	17.3
1.5SMCJ58A	1.5SMCJ58CA	58	1	64.40	67.80	71.20	1	93.6	16.1
1.5SMCJ60A	1.5SMCJ60CA	60	1	66.70	70.20	73.70	1	96.8	15.5
1.5SMCJ64A	1.5SMCJ64CA	64	1	71.10	74.90	78.60	1	103	14.6
1.5SMCJ70A	1.5SMCJ70CA	70	1	77.80	81.90	86.00	1	113	13.3
1.5SMCJ75A	1.5SMCJ75CA	75	1	83.30	87.70	92.10	1	121	12.4
1.5SMCJ78A	1.5SMCJ78CA	78	1	86.70	91.30	95.80	1	126	11.9
1.5SMCJ85A	1.5SMCJ85CA	85	1	94.40	99.20	104.00	1	137	11.0
1.5SMCJ90A	1.5SMCJ90CA	90	1	100.00	105.50	111.00	1	146	10.3
1.5SMCJ100A	1.5SMCJ100CA	100	1	111.00	117.00	123.00	1	162	9.3
1.5SMCJ110A	1.5SMCJ110CA	110	1	122.00	128.50	135.00	1	177	8.5
1.5SMCJ120A	1.5SMCJ120CA	120	1	133.00	140.00	147.00	1	193	7.8
1.5SMCJ130A	1.5SMCJ130CA	130	1	144.00	151.50	159.00	1	209	7.2
1.5SMCJ150A	1.5SMCJ150CA	150	1	167.00	176.00	185.00	1	243	6.2
1.5SMCJ160A	1.5SMCJ160CA	160	1	178.00	187.50	197.00	1	259	5.8
1.5SMCJ170A	1.5SMCJ170CA	170	1	189.00	199.00	209.00	1	275	5.5
1.5SMCJ180A	1.5SMCJ180CA	180	1	201.00	211.50	222.00	1	292	5.1
1.5SMCJ200A	1.5SMCJ200CA	200	1	224.00	235.50	247.00	1	324	4.6
1.5SMCJ220A	1.5SMCJ220CA	220	1	246.00	259.00	272.00	1	356	4.2
1.5SMCJ250A	1.5SMCJ250CA	250	1	279.00	294.00	309.00	1	405	3.7
1.5SMCJ300A	1.5SMCJ300CA	300	1	335.00	353.00	371.00	1	486	3.1
1.5SMCJ350A	1.5SMCJ350CA	350	1	391.00	411.50	432.00	1	567	2.6
1.5SMCJ400A	1.5SMCJ400CA	400	1	447.00	470.50	494.00	1	648	2.3
1.5SMCJ440A	1.5SMCJ440CA	440	1	492.00	517.50	543.00	1	713	2.1

For bidirectional type having V_{RWM} of 10 volts and less, the I_R 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 though 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 Ippm (peak impulse current)

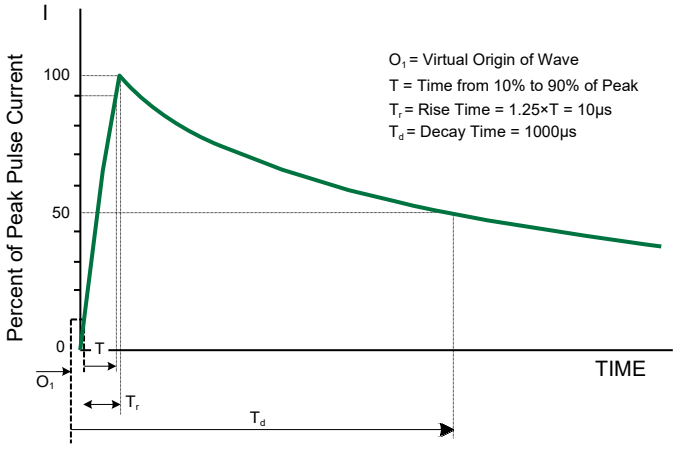
I_{PP} - Peak Pulse Current - Maximum Reverse Peak Pulse Current

P_{PP} - Peak Pulse Power Dissipation - Max power dissipation

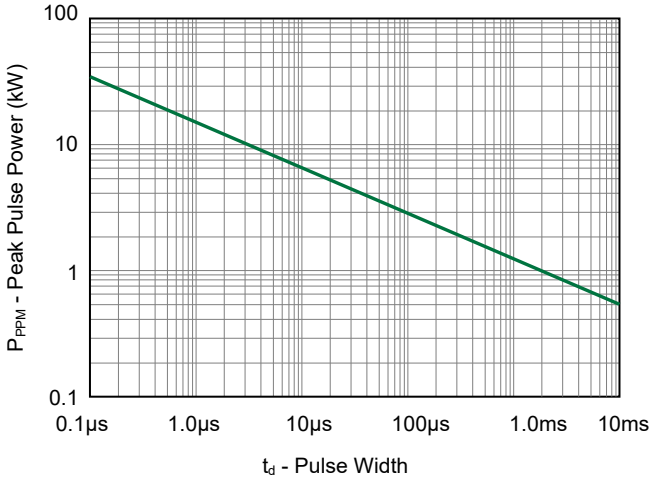
I_R - Reverse Leakage Current - Current measured at V_{RWM}

V_F - Forward Voltage - Drop for Uni-directional

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

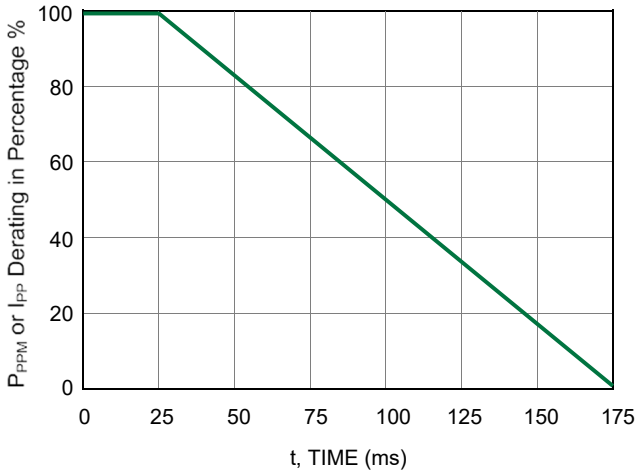


Pulse Waveform- 10/1000μs

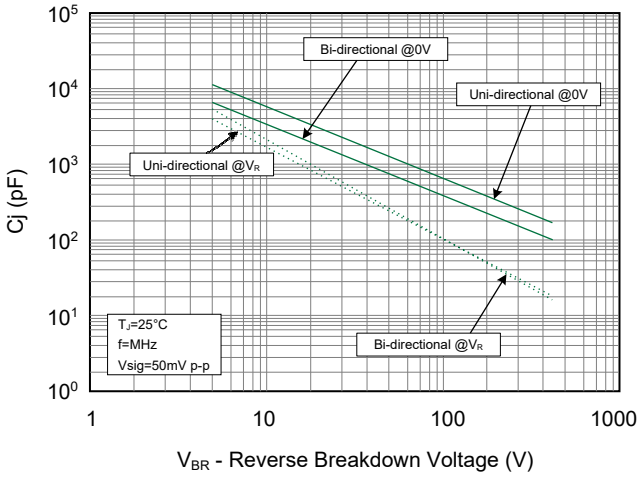


Peak Pulse Power Rating Curve

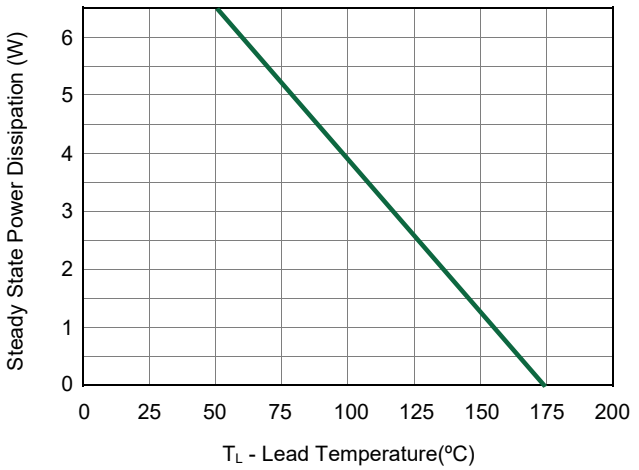
Ratings and Characteristic Curves (TA=25°C unless otherwise noted)



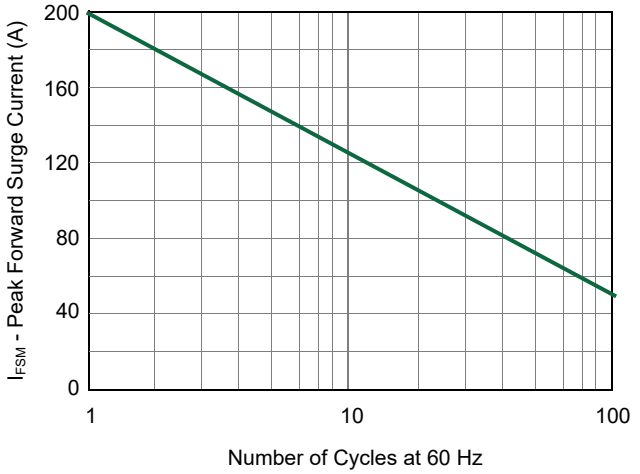
Pulse Derating Curve



Typical Junction Capacitance



Steady State Power Derating Curve

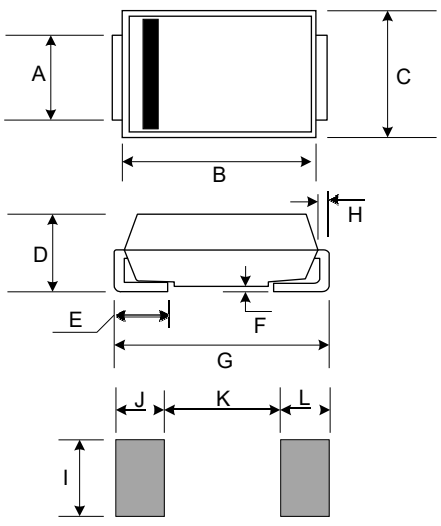


Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only

Product Dimensions

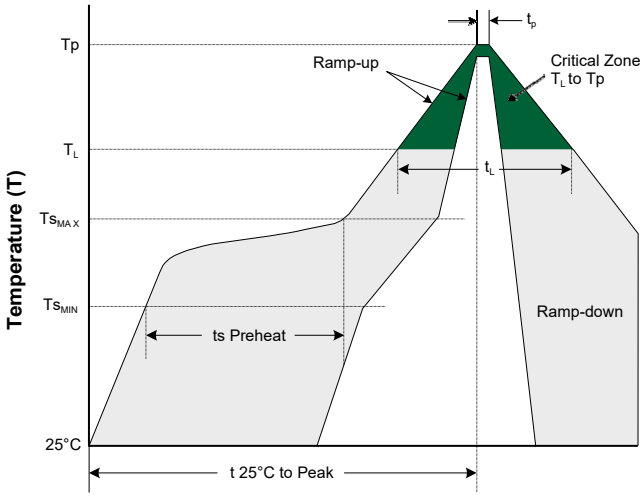
Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.108	0.128	2.750	3.250
B	0.260	0.291	6.600	7.400
C	0.220	0.246	5.590	6.250
D	0.078	0.116	1.980	2.950
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.303	0.323	7.700	8.200
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	2.400	-
K	-	0.165	-	4.200
L	0.094	-	2.400	-

SMC (DO-214AB)

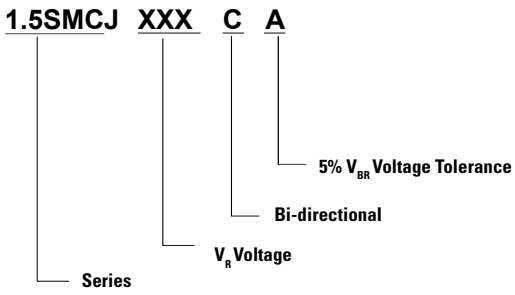


Soldering Parameters

Profile Feature	Lead-Free Assembly
Average Ramp-up Rate (Ts_{MAX} to Tp) Average Ramp-down Rate (Tp to T_L)	3°C/second max. 6°C/second max.
Preheat • Temperature Min (Ts_{MIN}) • Temperature Max (Ts_{MAX}) • Time (ts Preheat)	 150°C 200°C 60-180 seconds
Time maintained above: • Temperature (T_L) • Time (t_L)	 217°C 60-150 seconds
Peak/Classification Temperature • Temperature (Tp)	 $260^{+0/-5}$°C
Time within 5°C of actual Peak Time (t_p)	 20-40 seconds
Time 25°C to peak Temperature	8 minutes max
Do not exceed	260 °C



Part Numbering System



Order Information

Device	Package	Quantity	Tape
1.5SMCJ series	SMC/DO-214AB	500	7" Reel
1.5SMCJ series	SMC/DO-214AB	3000	13" Reel