

1.5SMC Series

Description

The 1.5SMC series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Features

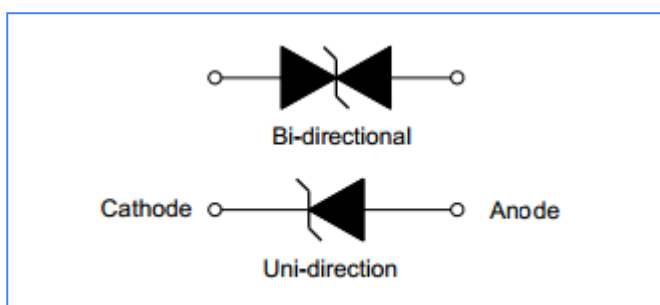
- Glass passivated chip
- 1500 W peak pulse power capability with a 10/1000 μ s waveform, repetitive rate (duty cycle):0.01 %
- Low leakage
- Uni and Bidirectional unit
- Excellent clamping capability
- Very fast response time

Mechanical Data

- Case: JEDEC DO-214AB. Molded plastic over glass passivated junction
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
- 1500 W peak pulse power capability with a 10/1000 μ s waveform
- Polarity: Color band denotes cathode except bi-directional models
- IEC61000-4-2 (ESD) $\pm$ 30kV (air), $\pm$ 30kV (contact).



Functional Diagram



Applications

TVS devices are ideal for the protection of I/O Interfaces, VCC bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak power dissipation with a 10/1000 μ s waveform ⁽¹⁾	P _{pp}	1500	Watts
Peak pulse current with a 10/1000 μ s waveform ⁽¹⁾	I _{pp}	See Next Table	Amps
Steady State Power Dissipation @ TL = 75 °C	P _D	6.5	Watts
Maximum Instantaneous Forward Voltage @ I _{pp} = 100 A (For Unidirectional Units Only)	V _F	3.5/5.0	Volts
Operating Temperature Range	T _J	-55 to +150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

Note:

1. Non-repetitive current pulse per Fig.5 and derated above TA= 25 °C per Fig.1
2. Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
3. VF<3.5V for devices of VBR<200V and VF<5.0V for devices of VBR>201V

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

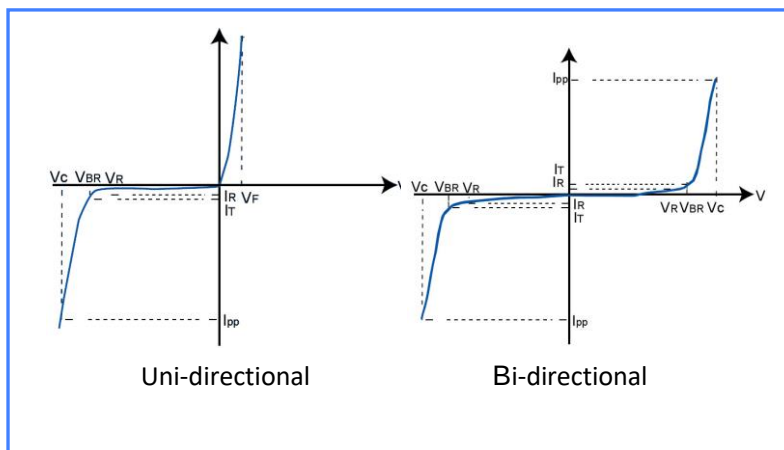
Part Number (Bi)	Part Number (Uni)	MARKING		Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts)@ I_T		Test Current I_T (mA)	Maximum Reverse Leakage I_R @ V_R (μ A)	Maximum Peak Pulse Current I_{pp} (A)	Maximum Clamping Voltage V_C @ I_{pp} (V)
		BI	UNI		Min .V	Max .V				
1.5SMC6.8CA	1.5SMC6.8A	6V8C	6V8A	5.8	6.46	7.14	10	1000	142.86	10.5
1.5SMC7.5CA	1.5SMC7.5A	7V5C	7V5A	6.4	7.13	7.88	10	500	132.74	11.3
1.5SMC8.2CA	1.5SMC8.2A	8V2C	8V2A	7.0	7.79	8.61	10	200	123.97	12.1
1.5SMC9.1CA	1.5SMC9.1A	9V1C	9V1A	7.8	8.65	9.56	1	50	111.94	13.4
1.5SMC10CA	1.5SMC10A	10C	10A	8.6	9.50	10.50	1	10	103.45	14.5
1.5SMC11CA	1.5SMC11A	11C	11A	9.4	10.45	11.55	1	5	96.15	15.6
1.5SMC12CA	1.5SMC12A	12C	12A	10.2	11.40	12.60	1	5	89.82	16.7
1.5SMC13CA	1.5SMC13A	13C	13A	11.1	12.35	13.65	1	1	82.42	18.2
1.5SMC15CA	1.5SMC15A	15C	15A	12.8	14.25	15.75	1	1	70.75	21.2
1.5SMC16CA	1.5SMC16A	16C	16A	13.6	15.20	16.80	1	1	66.67	22.5
1.5SMC18CA	1.5SMC18A	18C	18A	15.3	17.10	18.90	1	1	59.52	25.2
1.5SMC20CA	1.5SMC20A	20C	20A	17.1	19.00	21.00	1	1	54.15	27.7
1.5SMC22CA	1.5SMC22A	22C	22A	18.8	20.90	23.10	1	1	49.02	30.6
1.5SMC24CA	1.5SMC24A	24C	24A	20.5	22.80	25.20	1	1	45.18	33.2
1.5SMC27CA	1.5SMC27A	27C	27A	23.1	25.65	28.35	1	1	40.00	37.5
1.5SMC30CA	1.5SMC30A	30C	30A	25.6	28.50	31.50	1	1	36.23	41.4
1.5SMC33CA	1.5SMC33A	33C	33A	28.2	31.35	34.65	1	1	32.82	45.7
1.5SMC36CA	1.5SMC36A	36C	36A	30.8	34.20	37.80	1	1	30.06	49.9
1.5SMC39CA	1.5SMC39A	39C	39A	33.3	37.05	40.95	1	1	27.83	53.9
1.5SMC43CA	1.5SMC43A	43C	43A	36.8	40.85	45.15	1	1	25.30	59.3
1.5SMC47CA	1.5SMC47A	47C	47A	40.2	44.65	49.35	1	1	23.15	64.8
1.5SMC51CA	1.5SMC51A	51C	51A	43.6	48.45	53.55	1	1	21.40	70.1
1.5SMC56CA	1.5SMC56A	56C	56A	47.8	53.20	58.80	1	1	19.48	77.0
1.5SMC62CA	1.5SMC62A	62C	62A	53.0	58.90	65.10	1	1	17.65	85.0
1.5SMC68CA	1.5SMC68A	68C	68A	58.1	64.60	71.40	1	1	16.30	92.0
1.5SMC75CA	1.5SMC75A	75C	75A	64.1	71.25	78.75	1	1	14.56	103.0
1.5SMC82CA	1.5SMC82A	82C	82A	70.1	77.90	86.10	1	1	13.27	113.0
1.5SMC91CA	1.5SMC91A	91C	91A	77.8	86.45	95.55	1	1	12.00	125.0
1.5SMC100CA	1.5SMC100A	100C	100A	85.5	95.00	105.00	1	1	10.95	137.0
1.5SMC110CA	1.5SMC110A	110C	110A	94.0	104.50	115.50	1	1	9.87	152.0
1.5SMC120CA	1.5SMC120A	120C	120A	102.0	114.00	126.00	1	1	9.09	165.0
1.5SMC130CA	1.5SMC130A	130C	130A	111.0	123.50	136.50	1	1	8.38	179.0
1.5SMC150CA	1.5SMC150A	150C	150A	128.0	142.50	157.50	1	1	7.25	207.0
1.5SMC160CA	1.5SMC160A	160C	160A	136.0	152.00	168.00	1	1	6.85	219.0

1.5SMC170CA	1.5SMC170A	170C	170A	145.0	161.50	178.50	1	1	6.41	234.0
1.5SMC180CA	1.5SMC180A	180C	180A	154.0	171.00	189.00	1	1	6.10	246.0
1.5SMC200CA	1.5SMC200A	200C	200A	171.0	190.00	210.00	1	1	5.47	274.0
1.5SMC220CA	1.5SMC220A	220C	220A	185.0	209.00	231.00	1	1	4.57	328.0
1.5SMC250CA	1.5SMC250A	250C	250A	214.0	237.50	262.50	1	1	4.36	344.0
1.5SMC300CA	1.5SMC300A	300C	300A	256.0	285.00	315.00	1	1	3.62	414.0
1.5SMC350CA	1.5SMC350A	350C	350A	299.3	332.50	367.50	1	1	3.11	482.0
1.5SMC350CA	1.5SMC350A	380C	380A	324.9	361.00	399.00	1	1	2.86	524.4
1.5SMC400CA	1.5SMC400A	400C	400A	342.0	380.00	420.00	1	1	2.72	548.0
1.5SMC440CA	1.5SMC440A	440C	440A	376.2	418.00	462.00	1	1	2.47	602.0
1.5SMC500CA	1.5SMC500A	500C	500A	427.5	475.00	525.00	1	1	2.17	690.0
1.5SMC520CA	1.5SMC520A	520C	520A	444.6	494.00	546.00	1	1	2.09	717.6
1.5SMC550CA	1.5SMC550A	550C	550A	470.3	522.50	577.50	1	1	1.98	759.0
1.5SMC600CA	1.5SMC600A	600C	600A	513.0	570.00	630.00	1	1	1.81	828.0

Note:

1. The available parts are "A" type only, the parts without A (VBR is $\pm 10\%$) is not available
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
3. For Bi-Directional devices having VR of 10 volts and under, the IR limit is double

I-V Curve Characteristics



Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T (Test Current)

Rating & Characteristic Curves

Figure 1- Peak pulse power derating curve

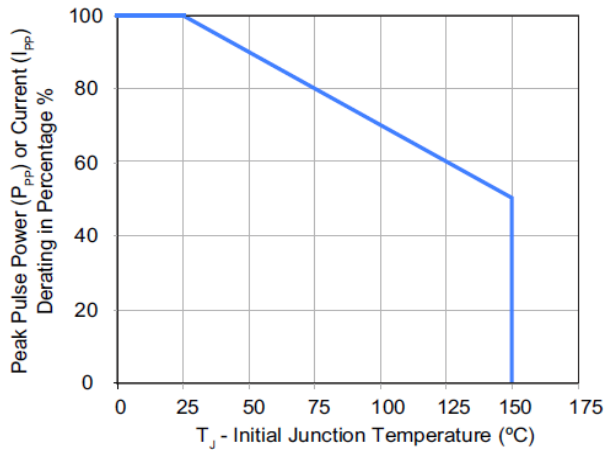


Figure 2- Pulse waveform

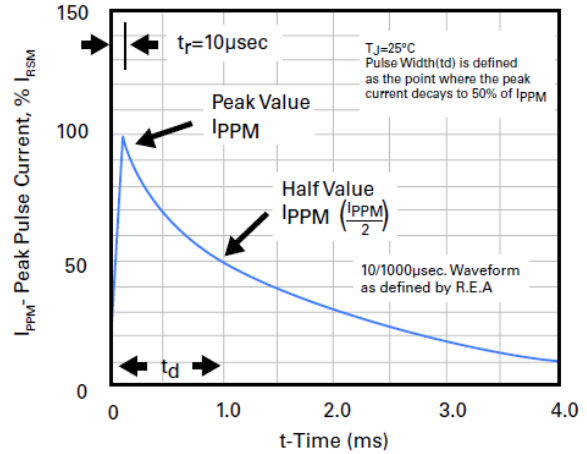


Figure 3- Peak pulse power rating curve

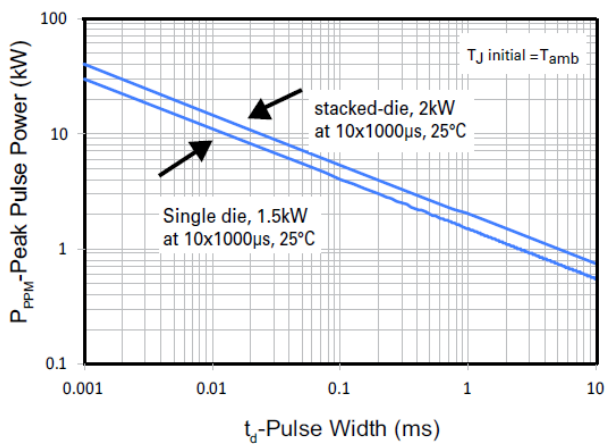


Figure 4- Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

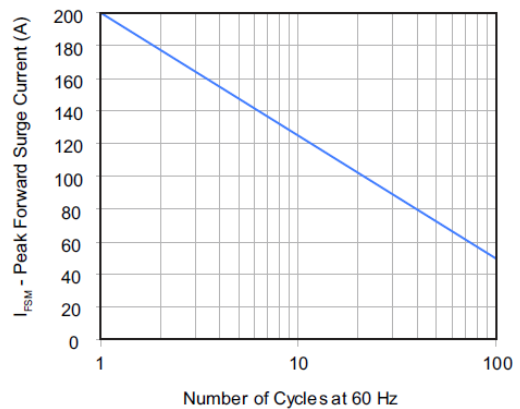
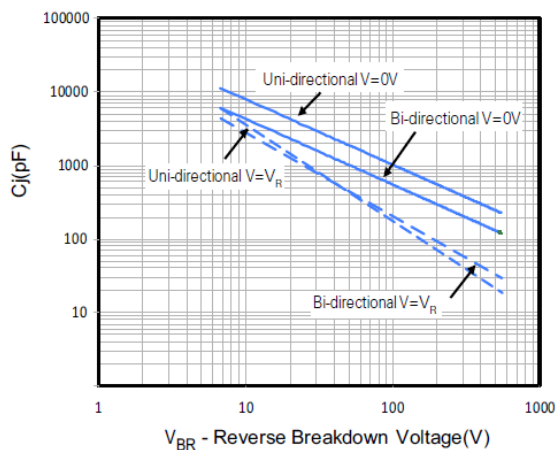
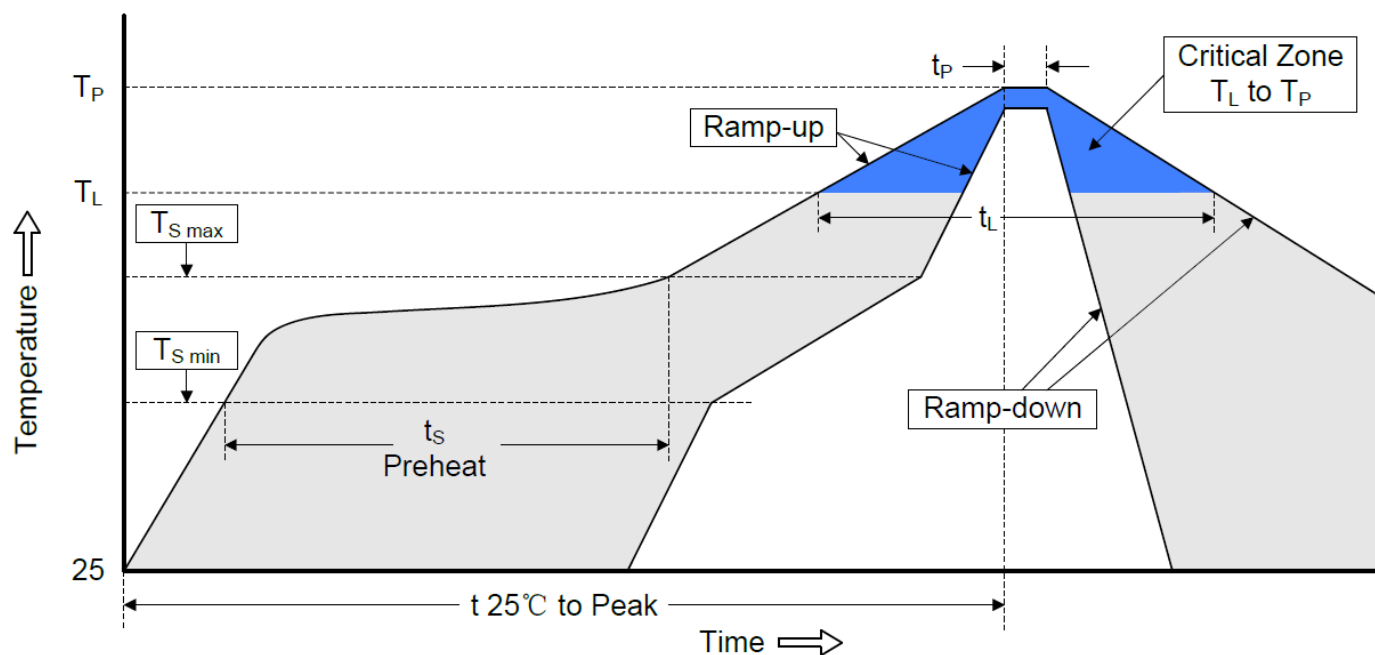


Figure 5- Typical Junction Capacitance

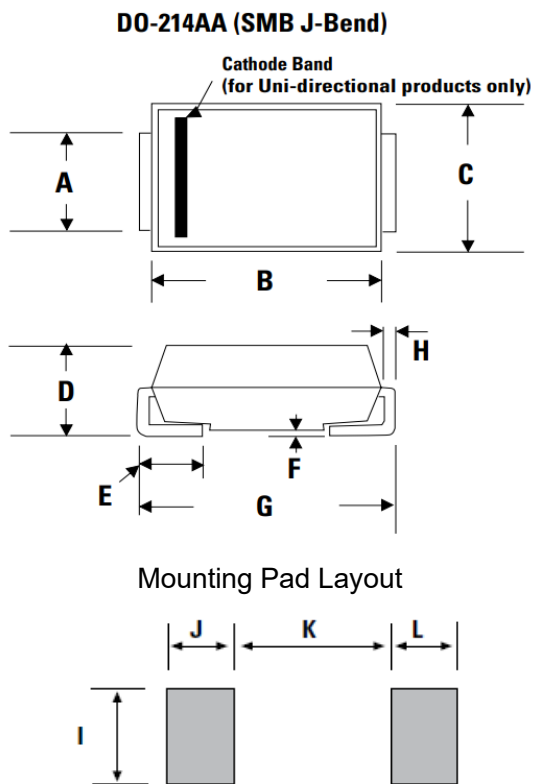


Soldering Parameters



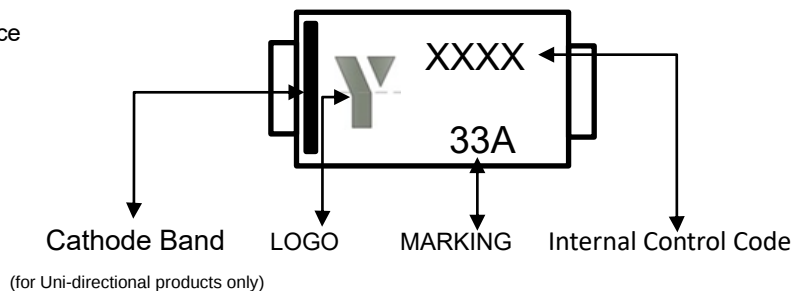
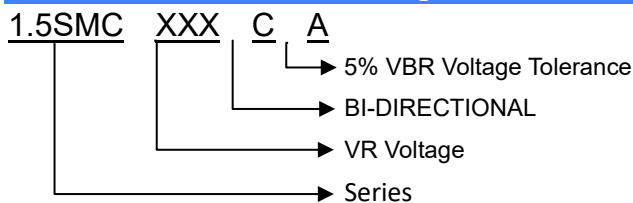
Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat	
-Temperature Min ($T_{S \min}$)	150°C
-Temperature Max ($T_{S \max}$)	200°C
-Time (min to max)(t_s)	60-180 seconds
$T_{S \max}$ to T_L	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
- Temperature (T_L)	217°C
- Time (t_L)	60-150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (t_p)	20-40 seconds
Ramp-down Rate	6°C /second max.
Time 25°C to Peak Temperature	8 minutes max.

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Dimensions	Millimeter	
	Min	Max
A	2.750	3.250
B	6.500	7.100
C	5.500	6.220
D	2.060	2.700
E	0.760	1.520
F	-	0.250
G	7.400	8.400
H	0.152	0.305
I	3.300	-
J	2.400	-
K	-	4.200
L	2.400	-

Part Number Code & Marking Code



Disclaimer

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.