

Transient Voltage Suppression Diodes: 1.5SMC Series

SMD Type 1500 W

■ Features

1. For surface mounted applications
2. RoHS compliant and halogen-free
3. Reliable low cost construction utilizing molded plastic technique
4. Glass passivated chip junction
5. Both bi-directional and uni-directional devices are available
6. Fast response time
7. Typical IR less than 1µA above 13V
8. Excellent clamping capacity
9. 1500 W peak pulse power capability with a 10/1000 µs waveform, repetition rate (duty cycle): 0.01%



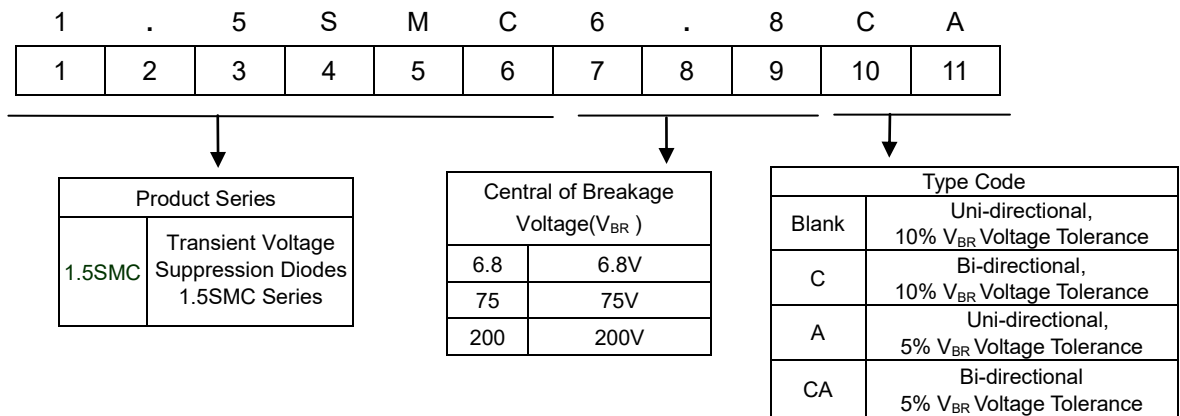
■ Recommended Applications

1. Telecommunication
2. Computer
3. Industrial device
4. Consumer electronic device

■ Mechanical Data

1. Case: DO-214AB (SMC), molded plastic meets UL flammability rating 94V-0
2. Terminal: Matte Tin-plated leads, solderable per MIL-STD-750, Method 2026
3. Polarity: The band denotes cathode (Note: no polarity indicator for bi-directional devices)

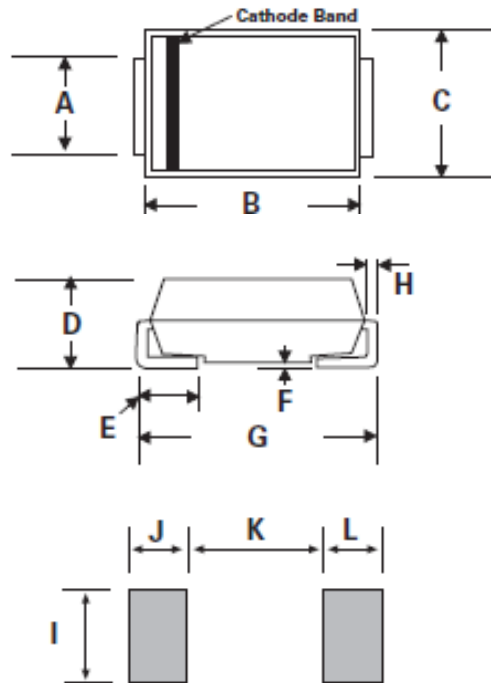
■ Part Number Code



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Structures and Dimensions

SMC/DO-214AB



Item	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.75	3.25	0.108	0.128
B	6.60	7.11	0.260	0.280
C	5.59	6.22	0.220	0.245
D	2.00	2.62	0.079	0.103
E	0.76	1.52	0.030	0.060
F	-	0.203	-	0.008
G	7.75	8.13	0.305	0.320
H	0.152	0.305	0.006	0.012
I	3.30	-	0.129	-
J/L	2.40	-	0.094	-
K	-	4.20	-	0.165

Maximum Rating ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation at $T_A=25^\circ\text{C}$ by 10/1000 μs waveform (Note1, Fig.1).	P_{PPM}	1500	W
Peak Pulse Current of on 10/1000us waveform.(Note1, Fig.3)	I_{PPM}	See Table	A
Peak forward surge current, 8.3ms single half sine wave on rated load (Note 2)	I_{FSM}	200	A
Steady State Power Dissipation $T_A=50^\circ\text{C}$ (Fig.5).	$PM_{(AV)}$	6.5	W
Operating junction and storage temperature range	T_J, T_{STG}	-55~+150	$^\circ\text{C}$

Notes:1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25^\circ\text{C}$ per Fig. 2.

2. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

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■ Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage V_{BR} @ IT		Test Current	Maximum Clamping Voltage V_C @ I_{pp}	Maximum Peak Pulse Current	Maximum Reverse Leakage I_R @ V_{RWM}	Marking Code	
			V_{RWM} (V)	Min (V)					Max (V)	I_T (mA)
1.5SMC6.8A	1.5SMC6.8CA	5.8	6.46	7.14	10	10.5	142.86	1000	6V8A	6V8C
1.5SMC7.5A	1.5SMC7.5CA	6.4	7.13	7.88	10	11.3	132.74	500	7V5A	7V5C
1.5SMC8.2A	1.5SMC8.2CA	7.0	7.79	8.61	10	12.1	123.97	200	8V2A	8V2C
1.5SMC9.1A	1.5SMC9.1CA	7.8	8.65	9.56	1	13.4	111.94	50	9V1A	9V1C
1.5SMC10A	1.5SMC10CA	8.6	9.50	10.50	1	14.5	103.45	10	10A	10C
1.5SMC11A	1.5SMC11CA	9.4	10.45	11.55	1	15.6	96.15	5	11A	11C
1.5SMC12A	1.5SMC12CA	10.2	11.40	12.60	1	16.7	89.82	5	12A	12C
1.5SMC13A	1.5SMC13CA	11.1	12.35	13.65	1	18.2	82.42	1	13A	13C
1.5SMC15A	1.5SMC15CA	12.8	14.25	15.75	1	21.2	70.75	1	15A	15C
1.5SMC16A	1.5SMC16CA	13.6	15.20	16.80	1	22.5	66.67	1	16A	16C
1.5SMC18A	1.5SMC18CA	15.3	17.10	18.90	1	25.2	59.52	1	18A	18C
1.5SMC20A	1.5SMC20CA	17.1	19.00	21.00	1	27.7	54.15	1	20A	20C
1.5SMC22A	1.5SMC22CA	18.8	20.90	23.10	1	30.6	49.02	1	22A	22C
1.5SMC24A	1.5SMC24CA	20.5	22.80	25.20	1	33.2	45.18	1	24A	24C
1.5SMC27A	1.5SMC27CA	23.1	25.65	28.35	1	37.5	40.00	1	27A	27C
1.5SMC30A	1.5SMC30CA	25.6	28.50	31.50	1	41.4	36.23	1	30A	30C
1.5SMC33A	1.5SMC33CA	28.2	31.35	34.65	1	45.7	32.82	1	33A	33C
1.5SMC36A	1.5SMC36CA	30.8	34.20	37.80	1	49.9	30.06	1	36A	36C
1.5SMC39A	1.5SMC39CA	33.3	37.05	40.95	1	53.9	27.83	1	39A	39C
1.5SMC43A	1.5SMC43CA	36.8	40.85	45.15	1	59.3	25.30	1	43A	43C
1.5SMC47A	1.5SMC47CA	40.2	44.65	49.35	1	64.8	23.15	1	47A	47C
1.5SMC51A	1.5SMC51CA	43.6	48.45	53.55	1	70.1	21.40	1	51A	51C
1.5SMC56A	1.5SMC56CA	47.8	53.20	58.80	1	77.0	19.48	1	56A	56C
1.5SMC62A	1.5SMC62CA	53.0	58.90	65.10	1	85.0	17.65	1	62A	62C
1.5SMC68A	1.5SMC68CA	58.1	64.60	71.40	1	92.0	16.30	1	68A	68C
1.5SMC75A	1.5SMC75CA	64.1	71.25	78.75	1	103.0	14.56	1	75A	75C
1.5SMC82A	1.5SMC82CA	70.1	77.90	86.10	1	113.0	13.27	1	82A	82C
1.5SMC91A	1.5SMC91CA	77.8	86.45	95.55	1	125.0	12.00	1	91A	91C
1.5SMC100A	1.5SMC100CA	85.5	95.00	105.00	1	137.0	10.95	1	100A	100C

Notes: For bidirectional type having V_{RWM} of 10 volts and less, the I_R limit is double.

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■ Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage V_{BR} @ I_T		Test Current	Maximum Clamping Voltage V_C @ I_{pp}	Maximum Peak Pulse Current	Maximum Reverse Leakage I_R @ V_{RWM}	Marking Code	
			V_{RWM} (V)	Min(V)					Max(V)	I_T (mA)
1.5SMC110A	1.5SMC110CA	94.0	104.50	115.50	1	152.0	9.87	1	110A	110C
1.5SMC120A	1.5SMC120CA	102.0	114.00	126.00	1	165.0	9.09	1	120A	120C
1.5SMC130A	1.5SMC130CA	111.0	123.50	136.50	1	179.0	8.38	1	130A	130C
1.5SMC150A	1.5SMC150CA	128.0	142.50	157.50	1	207.0	7.25	1	150A	150C
1.5SMC160A	1.5SMC160CA	136.0	152.00	168.00	1	219.0	6.85	1	160A	160C
1.5SMC170A	1.5SMC170CA	145.0	161.50	178.50	1	234.0	6.41	1	170A	170C
1.5SMC180A	1.5SMC180CA	154.0	171.00	189.00	1	246.0	6.10	1	180A	180C
1.5SMC200A	1.5SMC200CA	171.0	190.00	210.00	1	274.0	5.47	1	200A	200C
1.5SMC220A	1.5SMC220CA	185.0	209.00	231.00	1	328.0	4.57	1	220A	220C
1.5SMC250A	1.5SMC250CA	214.0	237.50	262.50	1	344.0	4.36	1	250A	250C
1.5SMC300A	1.5SMC300CA	256.0	285.00	315.00	1	414.0	3.62	1	300A	300C
1.5SMC350A	1.5SMC350CA	299.3	332.50	367.50	1	482.0	3.11	1	350A	350C
1.5SMC380A	1.5SMC380CA	324.9	361.00	399.00	1	524.4	2.86	1	380A	380C
1.5SMC400A	1.5SMC400CA	342.0	380.00	420.00	1	548.0	2.72	1	400A	400C
1.5SMC440A	1.5SMC440CA	376.2	418.00	462.00	1	602.0	2.47	1	440A	440C
1.5SMC500A	1.5SMC500CA	427.5	475.00	525.00	1	690.0	2.17	1	500A	500C
1.5SMC520A	1.5SMC520CA	444.6	494.00	546.00	1	717.6	2.09	1	520A	520C
1.5SMC550A	1.5SMC550CA	470.3	522.50	577.50	1	759.0	1.98	1	550A	550C
1.5SMC600A	1.5SMC600CA	513.0	570.00	630.00	1	828.0	1.81	1	600A	600C

Notes: For bidirectional type having V_{RWM} of 10 volts and less, the I_R limit is double.

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Rate and Characteristic Curve ($T_A=25^\circ\text{C}$ unless otherwise noted)

FIG.1 - PULSE RATING CURVE

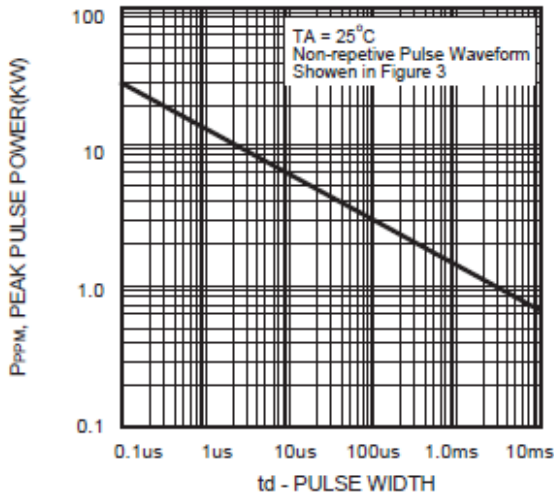


FIG.2 - PULSE DERATING CURVE

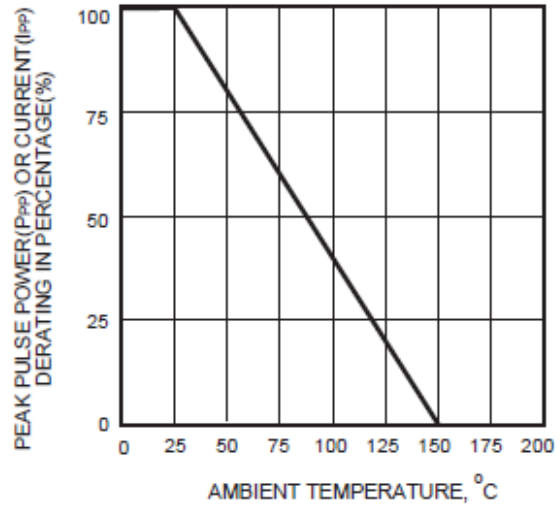


FIG.3 - PULSE WAVEFORM

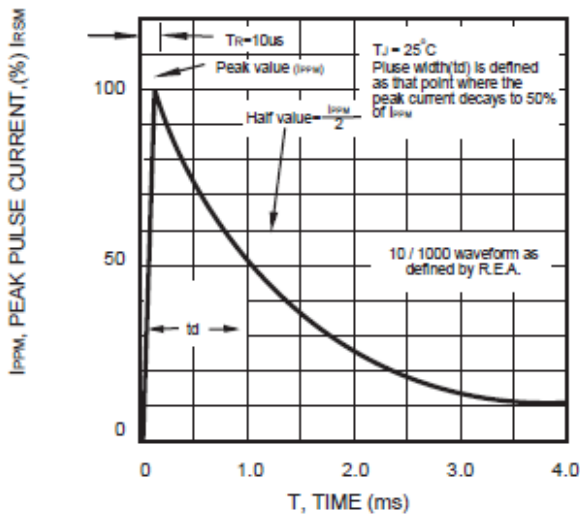


FIG.4 - TYPICAL JUNCTION CAPACITANCE

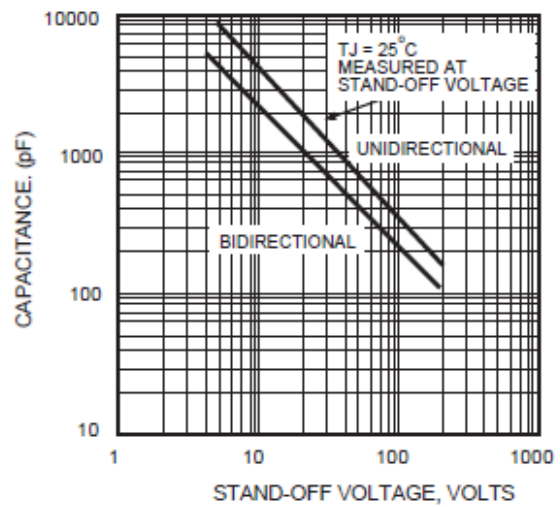
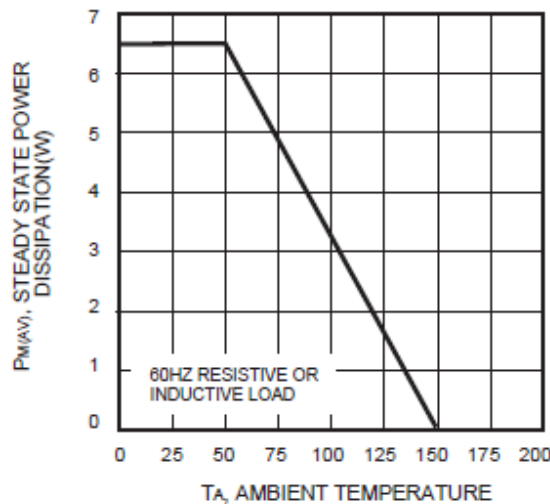
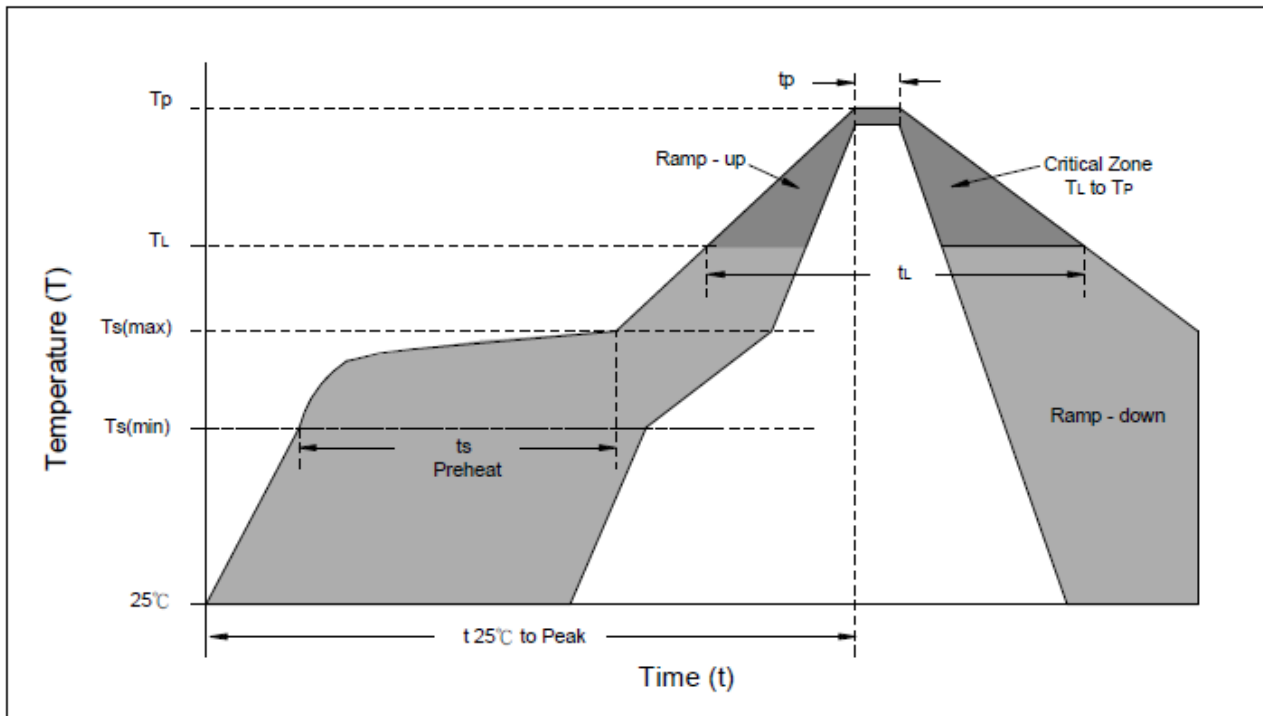


FIG.5 - STEADY STATE POWER DERATING CURVE



SMD Type 1500 W

■ Soldering Recommendation

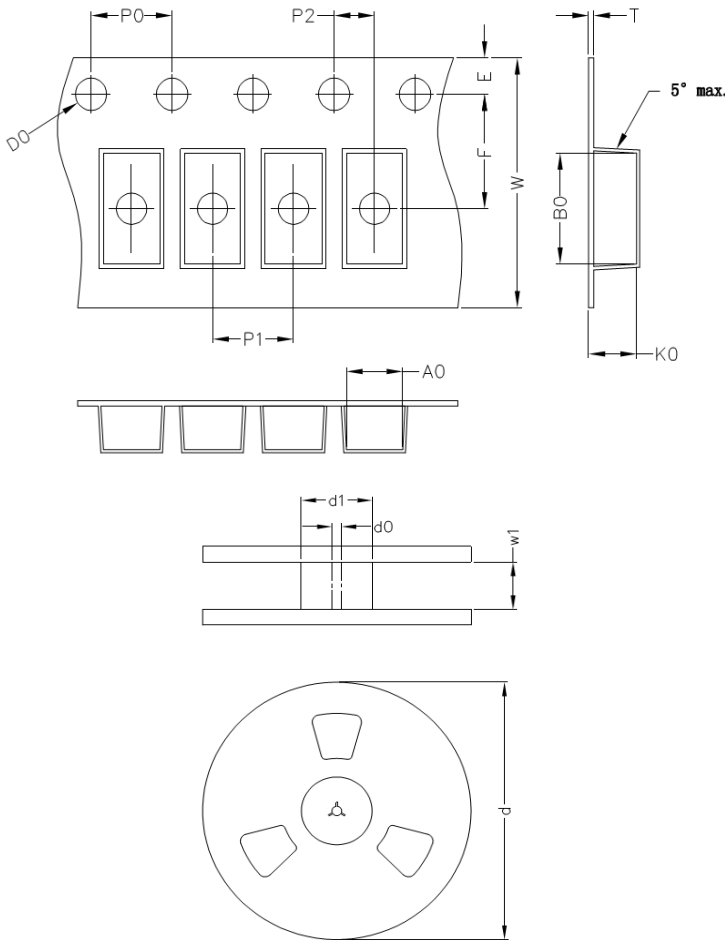


Reflow Condition	Lead-free assembly
Preheat -Temperature Min(Ts min) -Temperature Min(Ts max) -Time (min to max) (ts)	150°C 200°C 60 – 180 seconds
Average ramp up rate -Temperature Liquidus (TL) to peak	3°C/second max
Ts(max) to TL -Ramp-up Rate	3°C/second max.
Reflow -Temperature Liquidus (TL) -Time (tL)	217°C 60 – 150 seconds
Peak Temperature (TP)	260°C
Time within 5°C of actual peak Temperature(tp)	20 – 40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to peak Temperature(TP)	8 minutes max.
Do not exceed	260°C

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■ Packaging



Item	Symbol	DO-214AB (SMC) 單位:mm
Carrier width	A0	6.05
Carrier length	B0	8.31
Carrier depth	K0	2.54
Sprocket hole	D0	1.55
Sprocket hole position	E	1.75
Punch hole position	F	7.50
Sprocket hole pinth	P0	4.00
Carrier pinth	P1	8.00
Embossment center	P2	2.00
Tape thickness	T	0.25
Tape width	W	16.00
Reel outside diameter	d (13")	330.00
Reel inner diameter	d1	75
Feed hole diameter	d0	13.50
Reel inner width	w1	17.00

Notes: The tolerance of carrier tape and top cover is $\pm 0.1\text{mm}$, the tolerance of reel is $\pm 2\text{mm}$

■ Quantity

Package Type	Reel Size	Reel	Inner Box
	inch	Kpcs	Kpcs
DO-214AB	13	3	6

■ Warehouse Storage Conditions of product

- Storage condition:
 - Storage Temperature: $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
 - Relative Humidity: $\leq 75\% \text{RH}$
 - Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.