Transient Voltage Suppression Diodes: SMCJ Series

SMD Type 1500 W

α Therm

■ 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 11V
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

S	M	C	J	5	.	0	C	A
1	2	3	4	5	6	7	8	9

Product Series	
SMCJ	Transient Voltage Suppression Diodes SMCJ Series

Reverse Stand off Voltage(V_{RWM})	
5.0	5V
70	70V
120	120V

Type Code	
Blank	Uni-directional, 10% V_{BR} Voltage Tolerance
C	Bi-directional, 10% V_{BR} Voltage Tolerance
A	Uni-directional, 5% V_{BR} Voltage Tolerance
CA	Bi-directional 5% V_{BR} Voltage Tolerance

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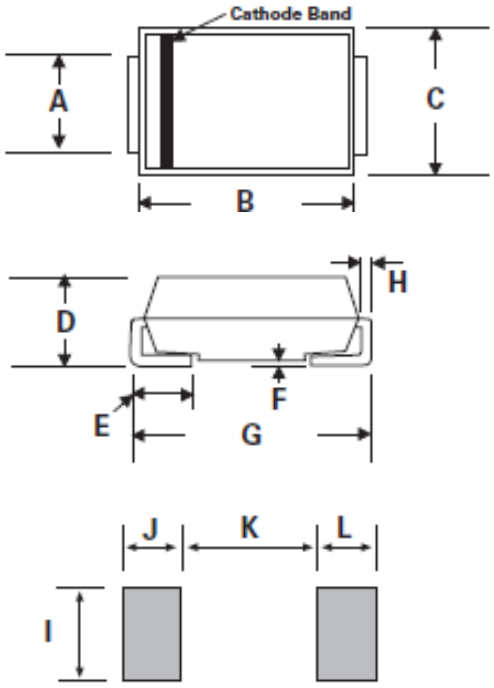
■ Structures and Dimensions

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℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation at T_A=25 ℃ by 10/1000μs 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 ℃ (Fig.5).	$P_{M(AV)}$	6.5	W
Operating junction and storage temperature range	T_J, T_{STG}	-55~+150	℃

Notes:1. Non-repetitive current pulse, per Fig. 3 and derated above T_A = 25℃ 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℃ 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 @ Ipp	Maximum Peak Pulse Current	Maximum Reverse Leakage I_R @V_{RWM}	Marking Code	
		V_{RWM} (V)	Min(V)	Max(V)	I_T(mA)	V_C(V)	Ipp(A)	I_R(μA)	UNI	BI
SMCJ5.0A	SMCJ5.0CA	5.0	6.40	7.00	10	9.2	163.0	800	GDE	BDE
SMCJ6.0A	SMCJ6.0CA	6.0	6.67	7.37	10	10.3	145.7	800	GDG	BDG
SMCJ6.5A	SMCJ6.5CA	6.5	7.22	7.98	10	11.2	134.0	500	GDK	BDK
SMCJ7.0A	SMCJ7.0CA	7.0	7.78	8.60	10	12.0	125.0	200	GDM	BDM
SMCJ7.5A	SMCJ7.5CA	7.5	8.33	9.21	1	12.9	116.3	100	GDP	BDP
SMCJ8.0A	SMCJ8.0CA	8.0	8.89	9.83	1	13.6	110.3	50	GDR	BDR
SMCJ8.5A	SMCJ8.5CA	8.5	9.44	10.4	1	14.4	104.2	20	GDT	BDT
SMCJ9.0A	SMCJ9.0CA	9.0	10.0	11.1	1	15.4	97.4	10	GDV	BDV
SMCJ10A	SMCJ10CA	10	11.1	12.3	1	17.0	88.3	5	GDX	BDX
SMCJ11A	SMCJ11CA	11	12.2	13.5	1	18.2	82.5	1	GDZ	BDZ
SMCJ12A	SMCJ12CA	12	13.3	14.7	1	19.9	75.4	1	GEE	BEE
SMCJ13A	SMCJ13CA	13	14.4	15.9	1	21.5	69.8	1	GEG	BEG
SMCJ14A	SMCJ14CA	14	15.6	17.2	1	23.2	64.7	1	GEK	BEK
SMCJ15A	SMCJ15CA	15	16.7	18.5	1	24.4	61.5	1	GEM	BEM
SMCJ16A	SMCJ16CA	16	17.8	19.7	1	26.0	57.7	1	GEP	BEP
SMCJ17A	SMCJ17CA	17	18.9	20.9	1	27.6	54.4	1	GER	BER
SMCJ18A	SMCJ18CA	18	20.0	22.1	1	29.2	51.4	1	GET	BET
SMCJ20A	SMCJ20CA	20	22.2	24.5	1	32.4	46.3	1	GEV	BEV
SMCJ22A	SMCJ22CA	22	24.4	26.9	1	35.5	42.3	1	GEX	BEX
SMCJ24A	SMCJ24CA	24	26.7	29.5	1	38.9	38.6	1	GEZ	BEZ
SMCJ26A	SMCJ26CA	26	28.9	31.9	1	42.1	35.7	1	GFE	BFE
SMCJ28A	SMCJ28CA	28	31.1	34.4	1	45.4	33.1	1	GFG	BFG
SMCJ30A	SMCJ30CA	30	33.3	36.8	1	48.4	31.0	1	GFK	BFK
SMCJ33A	SMCJ33CA	33	36.7	40.6	1	53.3	28.2	1	GFM	BFM
SMCJ36A	SMCJ36CA	36	40.0	44.2	1	58.1	25.9	1	GFP	BFP
SMCJ40A	SMCJ40CA	40	44.4	49.1	1	64.5	23.3	1	GFR	BFR
SMCJ43A	SMCJ43CA	43	47.8	52.8	1	69.4	21.7	1	GFT	BFT
SMCJ45A	SMCJ45CA	45	50.0	55.3	1	72.7	20.6	1	GFV	BFV
SMCJ48A	SMCJ48CA	48	53.3	58.9	1	77.4	19.4	1	GFX	BFX

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℃ 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 @ Ipp	Maximum Peak Pulse Current	Maximum Reverse Leakage I_R @VRWM	Marking Code	
		V_{RWM} (V)	Min(V)	Max(V)	I_T(mA)	V_C(V)	Ipp(A)	I_R(μA)	UNI	BI
SMCJ51A	SMCJ51CA	51	56.7	62.7	1	82.4	18.2	1	GFZ	BFZ
SMCJ54A	SMCJ54CA	54	60.0	66.3	1	87.1	17.3	1	GGE	BGE
SMCJ58A	SMCJ58CA	58	64.4	71.2	1	93.6	16.1	1	GGG	BGG
SMCJ60A	SMCJ60CA	60	66.7	73.7	1	96.8	15.5	1	GGK	BGK
SMCJ64A	SMCJ64CA	64	71.1	78.6	1	103	14.6	1	GGM	BGM
SMCJ70A	SMCJ70CA	70	77.8	86.0	1	113	13.3	1	GGP	BGP
SMCJ75A	SMCJ75CA	75	83.3	92.1	1	121	12.4	1	GGR	BGR
SMCJ78A	SMCJ78CA	78	86.7	95.8	1	126	11.9	1	GGT	BGT
SMCJ85A	SMCJ85CA	85	94.4	104	1	137	11.0	1	GGV	BGV
SMCJ90A	SMCJ90CA	90	100	111	1	146	10.3	1	GGX	BGX
SMCJ100A	SMCJ100CA	100	111	123	1	162	9.3	1	GGZ	BGZ
SMCJ110A	SMCJ110CA	110	122	135	1	177	8.5	1	GHE	BHE
SMCJ120A	SMCJ120CA	120	133	147	1	193	7.8	1	GHG	BHG
SMCJ130A	SMCJ130CA	130	144	159	1	209	7.2	1	GHK	BHK
SMCJ150A	SMCJ150CA	150	167	185	1	243	6.2	1	GHM	BHM
SMCJ160A	SMCJ160CA	160	178	197	1	259	5.8	1	GHP	BHP
SMCJ170A	SMCJ170CA	170	189	209	1	275	5.5	1	GHR	BHR
SMCJ180A	SMCJ180CA	180	201	222	1	292	5.1	1	GHT	BHT
SMCJ190A	SMCJ190CA	190	209	243	1	308	4.8	1	GHV	BHV
SMCJ200A	SMCJ200CA	200	224	247	1	324	4.6	1	GHW	BHW
SMCJ220A	SMCJ220CA	220	246	272	1	356	4.2	1	GHX	BHX
SMCJ250A	SMCJ250CA	250	279	309	1	405	3.7	1	GHZ	BHZ
SMCJ300A	SMCJ300CA	300	335	371	1	486	3.1	1	GJE	BJE
SMCJ350A	SMCJ350CA	350	391	432	1	567	2.6	1	GJG	BJG
SMCJ400A	SMCJ400CA	400	447	494	1	648	2.3	1	GJK	BJK
SMCJ440A	SMCJ440CA	440	492	543	1	713	2.1	1	GJM	BJM

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℃ unless otherwise noted)**

FIG.1 - PULSE RATING CURVE

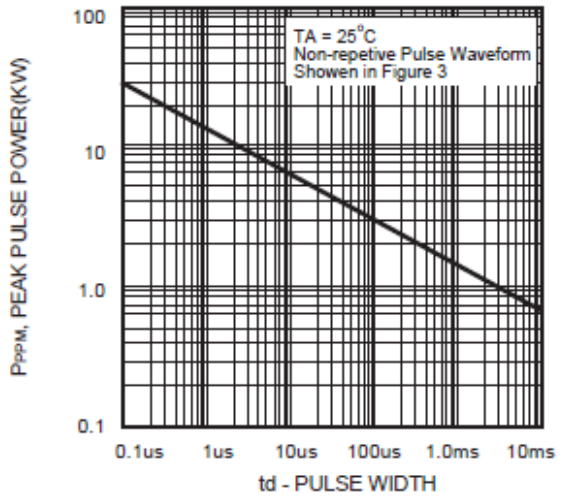


FIG.2 - PULSE DERATING CURVE

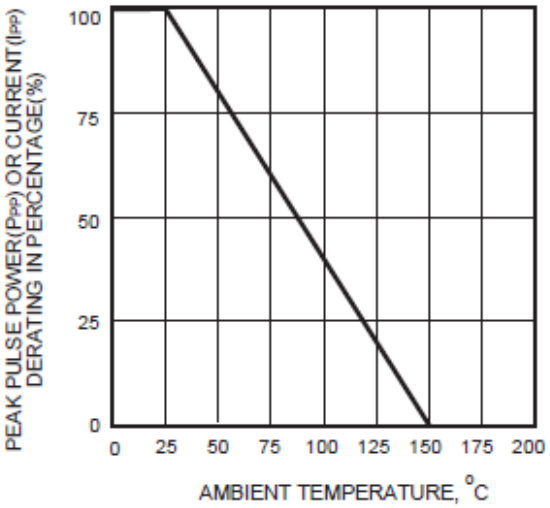


FIG.3 - PULSE WAVEFORM

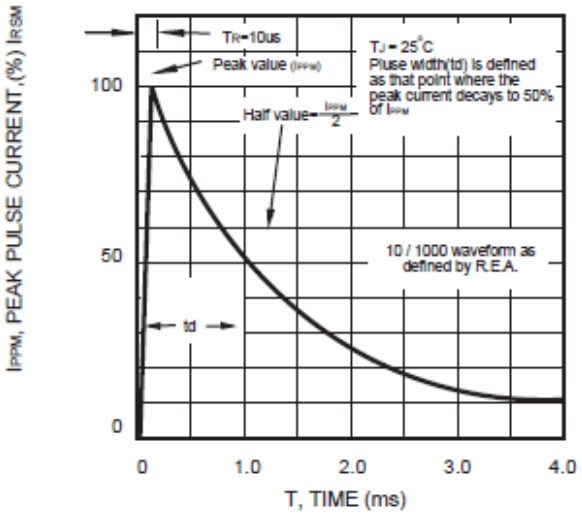


FIG.4 - TYPICAL JUNCTION CAPACITANCE

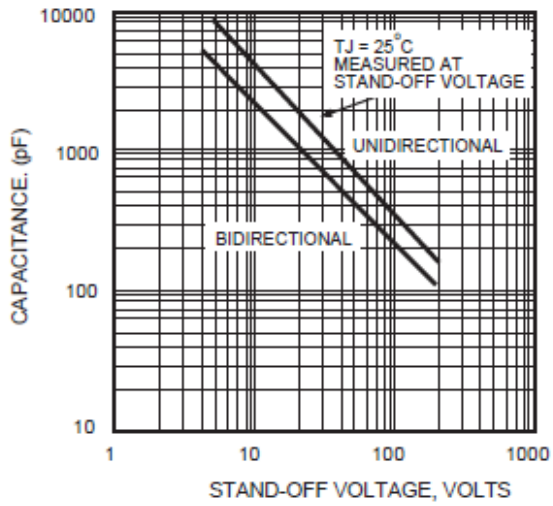
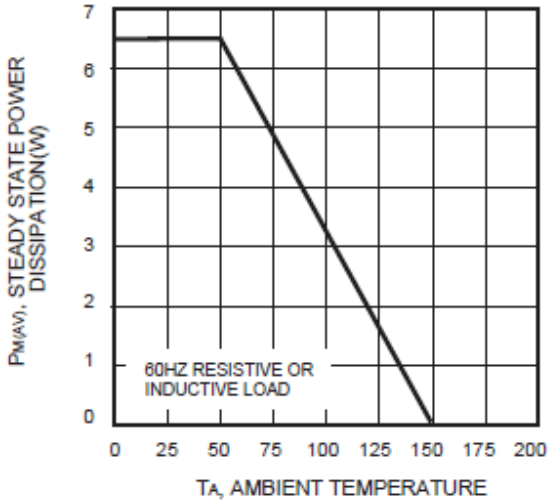
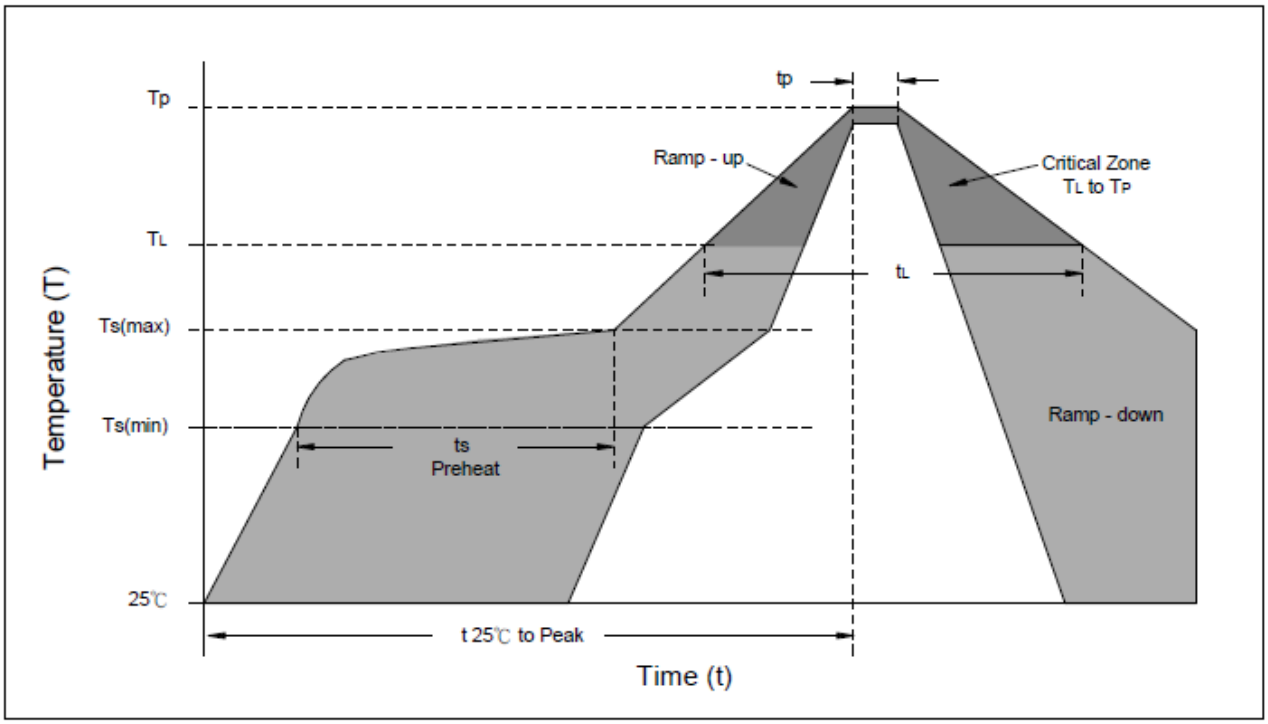


FIG.5 - STEADY STATE POWER DERATING CURVE



■ Soldering Recommendation



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

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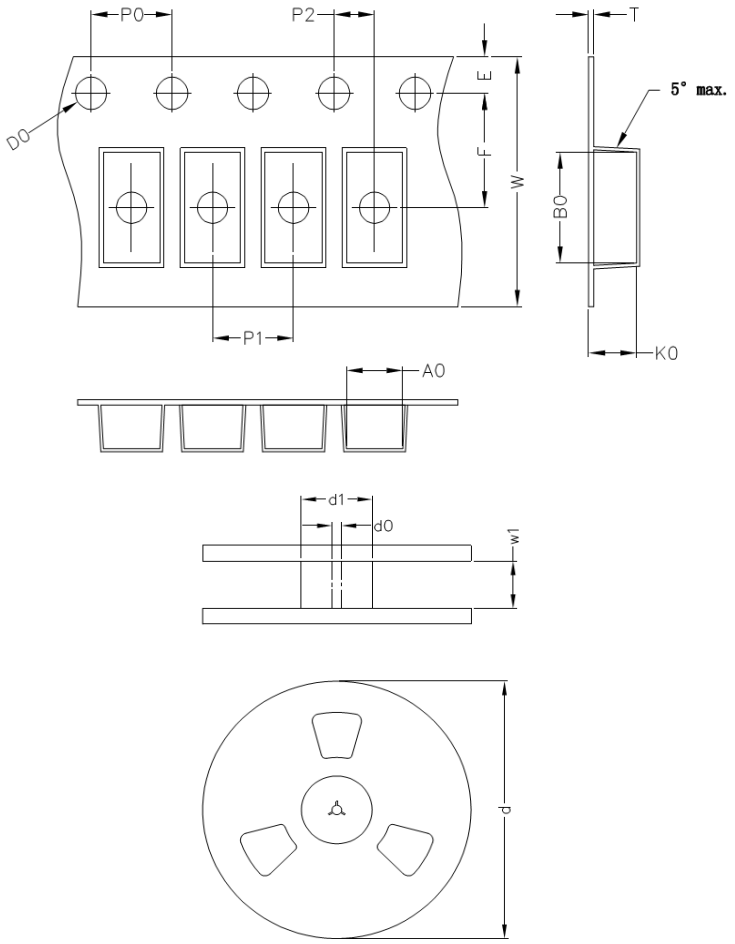
■ Packaging



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 ±0.1mm,the tolerance of reel is ±2mm

■ Quantity

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

■ Warehouse Storage Conditions of product

- Storage condition:

1.Storage Temperature: -10℃~+40℃

2.Relatiive Humidity: ≦75%RH

3.Keep away from corrosive atmosphere and sunlight.

- Period of Storage: 1 year.