

## Transient Voltage Suppressors (TVS) Data Sheet

### Description

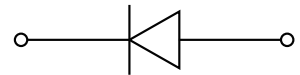
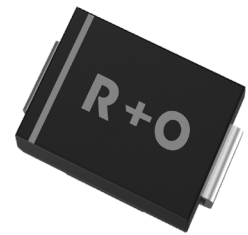
The SMCJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events

### Features

- For surface mounted applications in order to optimize board space
- Low leakage
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 1500W peak pulse power capability at 10/1000 $\mu$ s waveform
- Fast response time
- Typical IR less than 5 $\mu$ A above 12V
- High Temperature soldering: 260 $^{\circ}$ C /40 seconds at terminals
- Typical maximum temperature coefficient  $\Delta V_{BR} = 0.1\% \times V_{BR}@25^{\circ}C \times \Delta T$
- Plastic package has Underwriters Laboratory Flammability 94V-0
- Matte tin lead-free Plated
- Halogen free and RoHS compliant
- Typical failure mode is short from over-specified voltage or current
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- IEC 61000-4-2 ESD 30KV(Air),30KV(contact)

**Breakdown Voltage**  
5.0 to 440 V  
**Peak Pulse Power**  
1500 W

DO-214AB(SMC)



### 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 $^{\circ}$ C Unless otherwise specified)

PARAMETER	SYMBOL	VALUE	SYMBOL
Peak Pulse Power Dissipation with a 10/1000 $\mu$ s waveform (Fig.1)(Note 1), (Note 2)	$P_{PPM}$	1500	W
Peak Pulse Current with a 10/1000 $\mu$ s waveform.(Note1,Fig.3)	$I_{PP}$	See Next Table	A
Power Dissipation on Infinite Heat Sink at TL=75 $^{\circ}$ C	$P_{M(AV)}$	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)	$I_{FSM}$	200	A
Maximum Instantaneous Forward Voltage at 25A for Unidirectional Only(Note 4)	$V_F$	3.5/5.0	V
Operating junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^{\circ}$ C
Typical thermal resistance junction to lead	$R_{\theta J-L}$	15	$^{\circ}$ C /W
Typical thermal resistance junction to ambient	$R_{\theta J-A}$	75	$^{\circ}$ C /W

Note :

- (1) Non-repetitive current pulse, per Fig. 3 and derated above Ta = 25 $^{\circ}$ C per Fig. 2.
- (2) Mounted on 5.0mm x 5.0mm (0.03mm thick) Copper Pads to each terminal.
- (3) 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.
- (4)  $V_F < 3.5V$  for  $V_{BR} < 200V$  and  $V_F < 6.5V$  for  $V_{BR} > 201V$ .

## ● Package Outline Dimensions (SMC/DO-214AB)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.85	3.27	0.112	0.129
B	6.60	7.11	0.261	0.281
C	5.59	6.22	0.221	0.246
D	1.99	2.61	0.078	0.103
E	0.76	1.52	0.030	0.060
F	-	0.20	-	0.008
G	7.75	8.13	0.306	0.321
H	0.15	0.31	0.006	0.012

## ● Electrical Characteristics (Ta=25°C Unless otherwise specified)

Part Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage $V_{BR}$ (V) @ $I_T$		Test Current	Maximum Clamping Voltage@ $I_{PP}$	Peak Pulse Current	Reverse Leakage @ $V_{RWM}$
Uni	Bi	Uni	Bi	$V_{RWM}$ (V)	Min.	Max.	$I_T$ (mA)	$V_C$ (V)	$I_{PP}$ (A)	$I_R$ ( $\mu$ A)
SMCJ5.0A	SMCJ5.0CA	GDE	BDE	5	6.4	7	10	9.2	163.0	800
SMCJ6.0A	SMCJ6.0CA	GDG	BDG	6	6.67	7.37	10	10.3	145.7	800
SMCJ6.5A	SMCJ6.5CA	GDK	BDK	6.5	7.22	7.98	10	11.2	134.0	500
SMCJ7.0A	SMCJ7.0CA	GDM	BDM	7	7.78	8.6	10	12.0	125.0	200
SMCJ7.5A	SMCJ7.5CA	GDP	BDP	7.5	8.33	9.21	1	12.9	116.3	100
SMCJ8.0A	SMCJ8.0CA	GDR	BDR	8	8.89	9.83	1	13.6	110.3	50
SMCJ8.5A	SMCJ8.5CA	GDT	BDT	8.5	9.44	10.4	1	14.4	104.2	20
SMCJ9.0A	SMCJ9.0CA	GDV	BDV	9	10	11.1	1	15.4	97.4	10
SMCJ10A	SMCJ10CA	GDX	BDX	10	11.1	12.3	1	17.0	88.3	5
SMCJ11A	SMCJ11CA	GDZ	BDZ	11	12.2	13.5	1	18.2	82.5	1
SMCJ12A	SMCJ12CA	GEE	BEE	12	13.3	14.7	1	19.9	75.4	1
SMCJ13A	SMCJ13CA	GEG	BEG	13	14.4	15.9	1	21.5	69.8	1
SMCJ14A	SMCJ14CA	GEK	BEK	14	15.6	17.2	1	23.2	64.7	1
SMCJ15A	SMCJ15CA	GEM	BEM	15	16.7	18.5	1	24.4	61.5	1
SMCJ16A	SMCJ16CA	GEP	BEP	16	17.8	19.7	1	26.0	57.7	1
SMCJ17A	SMCJ17CA	GER	BER	17	18.9	20.9	1	27.6	54.4	1
SMCJ18A	SMCJ18CA	GET	BET	18	20	22.1	1	29.2	51.4	1
SMCJ20A	SMCJ20CA	GEV	BEV	20	22.2	24.5	1	32.4	46.3	1
SMCJ22A	SMCJ22CA	GEX	BEX	22	24.4	26.9	1	35.5	42.3	1
SMCJ24A	SMCJ24CA	GEZ	BEZ	24	26.7	29.5	1	38.9	38.6	1
SMCJ26A	SMCJ26CA	GFE	BFE	26	28.9	31.9	1	42.1	35.7	1
SMCJ28A	SMCJ28CA	GFG	BFG	28	31.1	34.4	1	45.4	33.1	1
SMCJ30A	SMCJ30CA	GFK	BFK	30	33.3	36.8	1	48.4	31.0	1

● **Electrical Characteristics** (Ta=25°C Unless otherwise specified)

Part Number		Marking		Reverse Stand-Off Voltage	Breakdown Voltage $V_{BR}$ (V) @ $I_T$		Test Current	Maximum Clamping Voltage@ $I_{PP}$	Peak Pulse Current	Reverse Leakage @ $V_{RWM}$
Uni	Bi	Uni	Bi	$V_{RWM}$ (V)	Min.	Max.	$I_T$ (mA)	$V_C$ (V)	$I_{PP}$ (A)	$I_R$ ( $\mu$ A)
SMCJ33A	SMCJ33CA	GFM	BFM	33	36.7	40.6	1	53.3	28.2	1
SMCJ36A	SMCJ36CA	GFP	BFP	36	40	44.2	1	58.1	25.9	1
SMCJ40A	SMCJ40CA	GFR	BFR	40	44.4	49.1	1	64.5	23.3	1
SMCJ43A	SMCJ43CA	GFT	BFT	43	47.8	52.8	1	69.4	21.7	1
SMCJ45A	SMCJ45CA	GFV	BFV	45	50	55.3	1	72.7	20.6	1
SMCJ48A	SMCJ48CA	GFX	BFX	48	53.3	58.9	1	77.4	19.4	1
SMCJ51A	SMCJ51CA	GFZ	BFZ	51	56.7	62.7	1	82.4	18.2	1
SMCJ54A	SMCJ54CA	GGE	BGE	54	60	66.3	1	87.1	17.3	1
SMCJ58A	SMCJ58CA	GGG	BGG	58	64.4	71.2	1	93.6	16.1	1
SMCJ60A	SMCJ60CA	GGK	BGK	60	66.7	73.7	1	96.8	15.5	1
SMCJ64A	SMCJ64CA	GGM	BGM	64	71.1	78.6	1	103	14.6	1
SMCJ70A	SMCJ70CA	GGP	BGP	70	77.8	86	1	113	13.3	1
SMCJ75A	SMCJ75CA	GGR	BGR	75	83.3	92.1	1	121	12.4	1
SMCJ78A	SMCJ78CA	GGT	BGT	78	86.7	95.8	1	126	11.9	1
SMCJ85A	SMCJ85CA	GGV	BGV	85	94.4	104	1	137	11.0	1
SMCJ90A	SMCJ90CA	GGX	BGX	90	100	111	1	146	10.3	1
SMCJ100A	SMCJ100CA	GGZ	BGZ	100	111	123	1	162	9.3	1
SMCJ110A	SMCJ110CA	GHE	BHE	110	122	135	1	177	8.5	1
SMCJ120A	SMCJ120CA	GHG	BHG	120	133	147	1	193	7.8	1
SMCJ130A	SMCJ130CA	GHK	BHK	130	144	159	1	209	7.2	1
SMCJ150A	SMCJ150CA	GHM	BHM	150	167	185	1	243	6.2	1
SMCJ160A	SMCJ160CA	GHP	BHP	160	178	197	1	259	5.8	1
SMCJ170A	SMCJ170CA	GHR	BHR	170	189	209	1	275	5.5	1
SMCJ180A	SMCJ180CA	GHT	BHT	180	201	222	1	292	5.1	1
SMCJ200A	SMCJ200CA	GHV	BHV	200	224	247	1	324	4.6	1
SMCJ220A	SMCJ220CA	GHX	BHX	220	246	272	1	356	4.2	1
SMCJ250A	SMCJ250CA	GHZ	BHZ	250	279	309	1	405	3.7	1
SMCJ300A	SMCJ300CA	GJE	BJE	300	335	371	1	486	3.1	1
SMCJ350A	SMCJ350CA	GJG	BJG	350	391	432	1	567	2.6	1
SMCJ400A	SMCJ400CA	GJK	BJK	400	447	494	1	648	2.3	1
SMCJ440A	SMCJ440CA	GJM	BJM	440	492	543	1	713	2.1	1

Note :

- (1) Suffix 'A' denotes 5% tolerance device.
- (2) Add suffix '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.

● Ratings And Characteristics Curves ( $T_a=25^\circ\text{C}$  Unless otherwise specified)

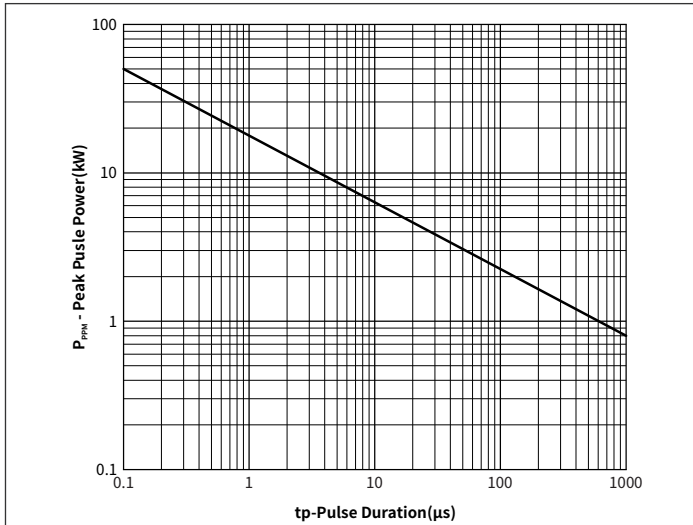


Fig. 1 Peak Pulse Power Rating Curve

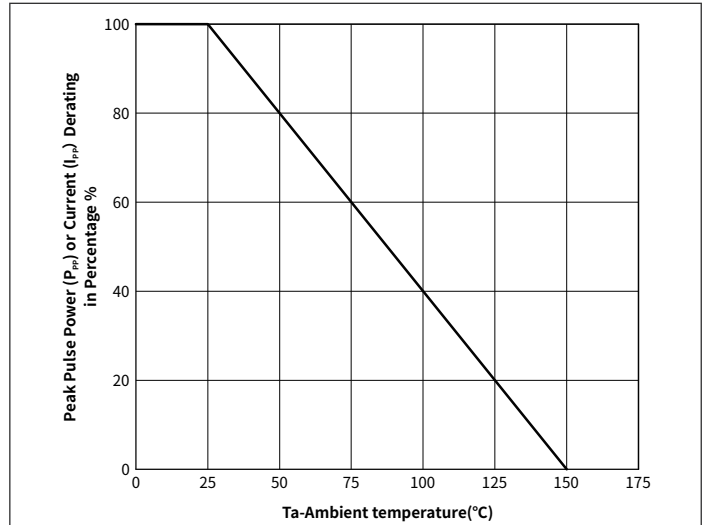


Fig. 2 Pulse Derating Curve

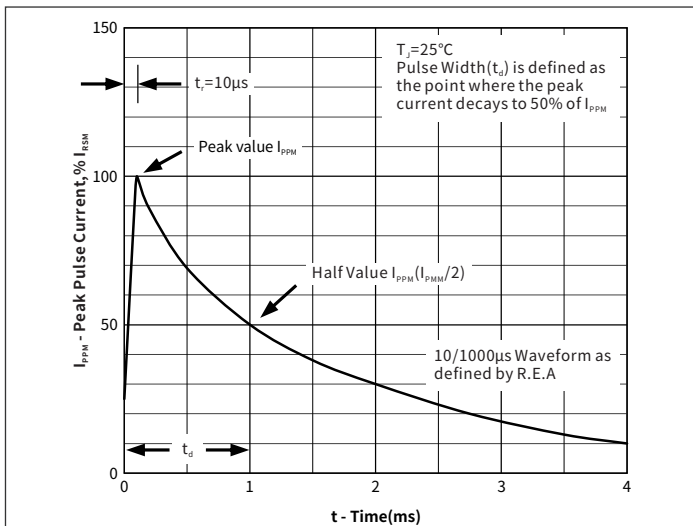


Fig. 3 Pulse Waveform

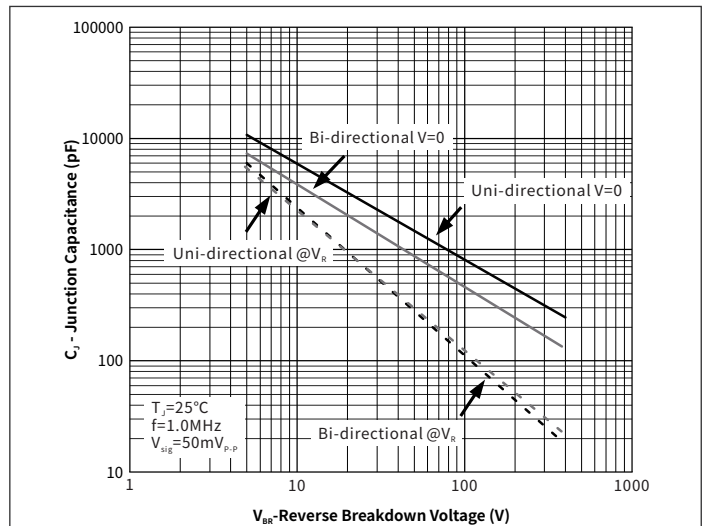


Fig. 4 Typical Junction Capacitance

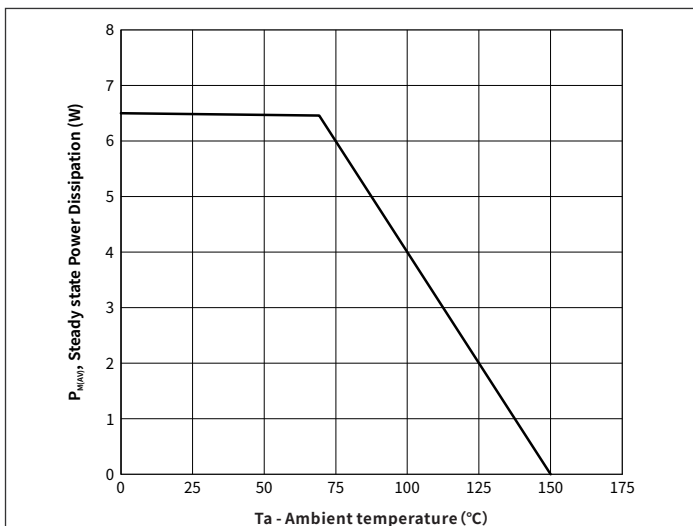


Fig. 5 Steady State Power Dissipation Derating Curve

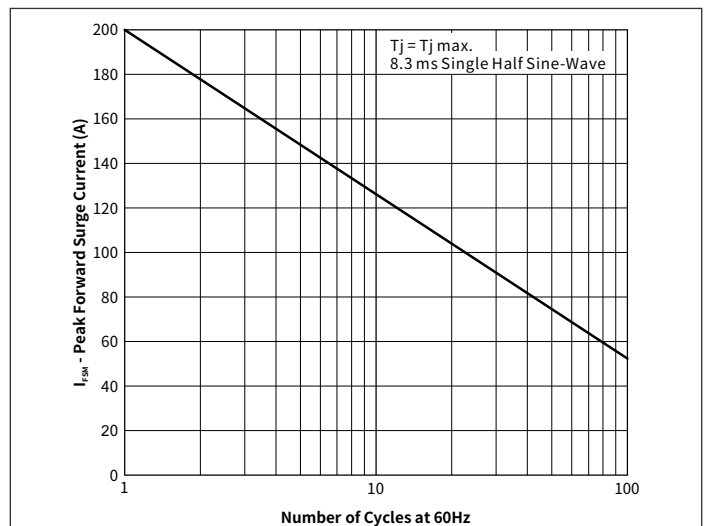
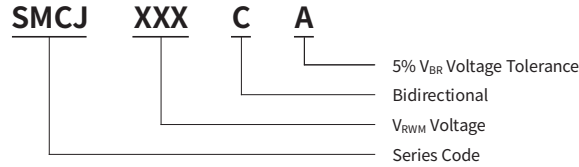


Fig. 6 Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

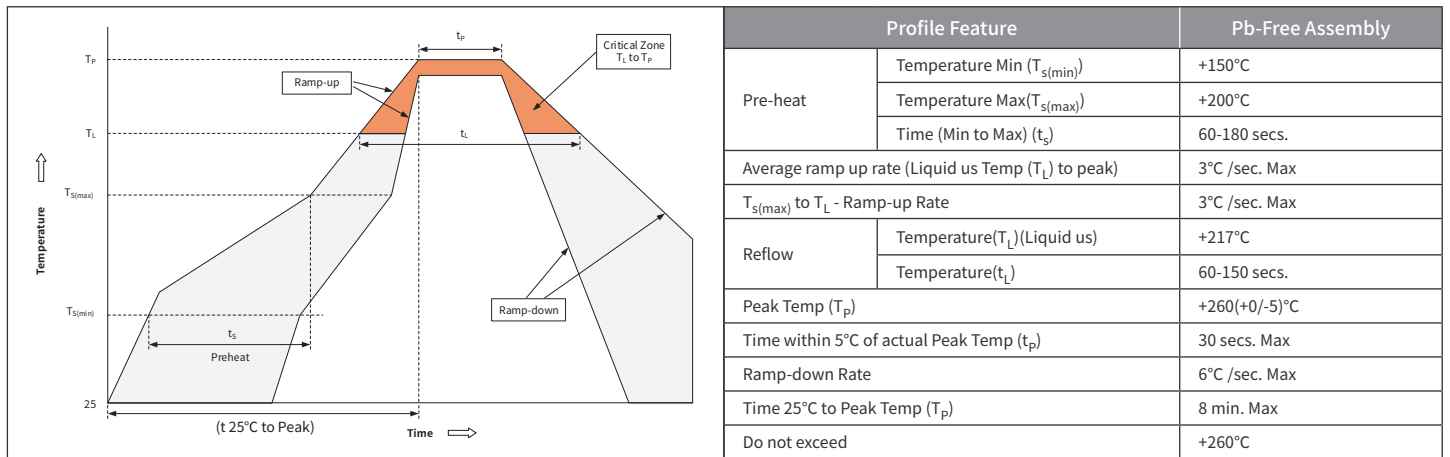
## Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SMC	R3	0.257	3000	6000	48000	13"

## Part Numbering



## Soldering Parameters



## Packaging (SMC/DO-214AB)

