

## DESCRIPTION

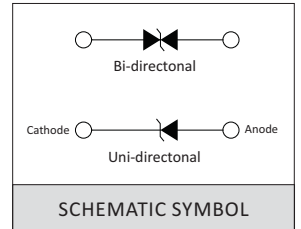
The SMCJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

## FEATURES

- > Low profile package
- > Ideal for automated placement
- > Available in uni-directional and Bi-directional
- > 1500 Watt peak pulse power capability with a 10/1000µs waveform
- > For surface mounted applications to optimize board space
- > Excellent clamping capability
- > Very fast response time
- > Low incremental surge resistance

## 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 AND CHARACTERISTICS Ratings at 25°C ambient temperature unless otherwise specified.

RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation on 10/1000us waveform (Note1,Note2).	P <sub>PPM</sub>	1500	Watts
Peak Pulse Current of on 10/1000us waveform(Note1).	I <sub>PPM</sub>	See Table	Amps
Steady State Power Dissipation at T=50°C(Note2).	P <sub>M(AV)</sub>	6.5	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method) (Note 3).	I <sub>FSM</sub>	200	Amps

### NOTES:

1. Non-repetitive current pulse, T<sub>A</sub>= 25°C.
2. Mounted on 8.0mm x 8.0mm (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.

## THERMAL CONSIDERATIONS

Symbol	Parameter	Value	Unit
T <sub>J</sub>	Operating Junction Temperature	-55 to +150	°C
T <sub>S</sub>	Storage Temperature Range	-55 to +150	°C
R <sub>θJA</sub>	Junction to Ambient on printed circuit	75	°C/W

### ELECTRICAL CHARACTERISTICS

Part Number		Device Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min.@I <sub>T</sub>	Breakdown Voltage Max.@I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
UNT-POLAR	BI-POLAR	UNI	BI	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>c</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> ( $\mu$ A)
SMCJ5.0A	SMCJ5.0CA	GDE	BDE	5.0	6.40	7.00	10	9.2	163.0	800
SMCJ6.0A	SMCJ6.0CA	GDG	BDG	6.0	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	7.0	7.78	8.60	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	8.0	8.89	9.83	1	13.6	110.3	50
SMCJ8.5A	SMCJ8.5CA	GDT	BDT	8.5	9.44	10.40	1	14.4	104.2	20
SMCJ9.0A	SMCJ9.0CA	GDV	BDV	9.0	10.00	11.10	1	15.4	97.4	10
SMCJ10A	SMCJ10CA	GDX	BDX	10.0	11.10	12.30	1	17.0	88.3	5
SMCJ11A	SMCJ11CA	GDZ	BDZ	11.0	12.20	13.50	1	18.2	82.5	1
SMCJ12A	SMCJ12CA	GEE	BEE	12.0	13.30	14.70	1	19.9	75.4	1
SMCJ13A	SMCJ13CA	GEG	BEG	13.0	14.40	15.90	1	21.5	69.8	1
SMCJ14A	SMCJ14CA	GEK	BEK	14.0	15.60	17.20	1	23.2	64.7	1
SMCJ15A	SMCJ15CA	GEM	BEM	15.0	16.70	18.50	1	24.4	61.5	1
SMCJ16A	SMCJ16CA	GEP	BEP	16.0	17.80	19.70	1	26.0	57.7	1
SMCJ17A	SMCJ17CA	GER	BER	17.0	18.90	20.90	1	27.6	54.4	1
SMCJ18A	SMCJ18CA	GET	BET	18.0	20.00	22.10	1	29.2	51.4	1
SMCJ20A	SMCJ20CA	GEV	BEV	20.0	22.20	24.50	1	32.4	46.3	1
SMCJ22A	SMCJ22CA	GEX	BEX	22.0	24.40	26.90	1	35.5	42.3	1
SMCJ24A	SMCJ24CA	GEZ	BEZ	24.0	26.70	29.50	1	38.9	38.6	1
SMCJ26A	SMCJ26CA	GFE	BFE	26.0	28.90	31.90	1	42.1	35.7	1
SMCJ28A	SMCJ28CA	GFG	BFG	28.0	31.10	34.40	1	45.4	33.1	1
SMCJ30A	SMCJ30CA	GFK	BFK	30.0	33.30	36.80	1	48.4	31.0	1
SMCJ33A	SMCJ33CA	GFM	BFM	33.0	36.70	40.60	1	53.3	28.2	1
SMCJ36A	SMCJ36CA	GFP	BFP	36.0	40.00	44.20	1	58.1	25.9	1
SMCJ40A	SMCJ40CA	GFR	BFR	40.0	44.40	49.10	1	64.5	23.3	1
SMCJ43A	SMCJ43CA	GFT	BFT	43.0	47.80	52.80	1	69.4	21.7	1
SMCJ45A	SMCJ45CA	GFV	BFV	45.0	50.00	55.30	1	72.7	20.6	1
SMCJ48A	SMCJ48CA	GFX	BFX	48.0	53.30	58.90	1	77.4	19.4	1
SMCJ51A	SMCJ51CA	GFZ	BFZ	51.0	56.70	62.70	1	82.4	18.2	1
SMCJ54A	SMCJ54CA	GGE	BGE	54.0	60.00	66.30	1	87.1	17.3	1

**ELECTRICAL CHARACTERISTICS**

Part Number		Device Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min.@I <sub>T</sub>	Breakdown Voltage Max.@I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
UNT-POLAR	BI-POLAR	UNI	BI	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>c</sub> (V)	I <sub>PP</sub> (A)	I <sub>r</sub> (uA)
SMCJ58A	SMCJ58CA	GGG	BGG	58	64.40	71.20	1	93.6	16.1	1
SMCJ60A	SMCJ60CA	GGK	BGK	60	66.70	73.70	1	96.8	15.5	1
SMCJ64A	SMCJ64CA	GGM	BGM	64	71.10	78.60	1	103.0	14.6	1
SMCJ70A	SMCJ70CA	GGP	BGP	70	77.80	86.00	1	113.0	13.3	1
SMCJ75A	SMCJ75CA	GGR	BGR	75	83.30	92.10	1	121.0	12.4	1
SMCJ78A	SMCJ78CA	GGT	BGT	78	86.70	95.80	1	126.0	11.9	1
SMCJ85A	SMCJ85CA	GGV	BGV	85	94.40	104.00	1	137.0	11.0	1
SMCJ90A	SMCJ90CA	GGX	BGX	90	100.00	111.00	1	146.0	10.3	1
SMCJ100A	SMCJ100CA	GGZ	BGZ	100	111.00	123.00	1	162.0	9.3	1
SMCJ110A	SMCJ110CA	GHE	BHE	110	122.00	135.00	1	177.0	8.5	1
SMCJ120A	SMCJ120CA	GHG	BHG	120	133.00	147.00	1	193.0	7.8	1
SMCJ130A	SMCJ130CA	GHK	BHK	130	144.00	159.00	1	209.0	7.2	1
SMCJ150A	SMCJ150CA	GHM	BHM	150	167.00	185.00	1	243.0	6.2	1
SMCJ160A	SMCJ160CA	GHP	BHP	160	178.00	197.00	1	259.0	5.8	1
SMCJ170A	SMCJ170CA	GHR	BHR	170	189.00	209.00	1	275.0	5.5	1
SMCJ180A	SMCJ180CA	GHT	BHT	180	201.00	222.00	1	292.0	5.1	1
SMCJ200A	SMCJ200CA	GHV	BHV	200	224.00	247.00	1	324.0	4.6	1
SMCJ220A	SMCJ220CA	GHX	BHX	220	246.00	272.00	1	356.0	4.2	1
SMCJ250A	SMCJ250CA	GHZ	BHZ	250	279.00	309.00	1	405.0	3.7	1
SMCJ300A	SMCJ300CA	GJE	BJE	300	335.00	371.00	1	486.0	3.1	1
SMCJ350A	SMCJ350CA	GJG	BJG	350	391.00	432.00	1	567.0	2.6	1
SMCJ400A	SMCJ400CA	GJK	BJK	400	447.00	494.00	1	648.0	2.3	1
SMCJ440A	SMCJ440CA	GJM	BJM	440	492.00	543.00	1	713.0	2.1	1

RATINGS AND CHARACTERISTIC CURVES ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

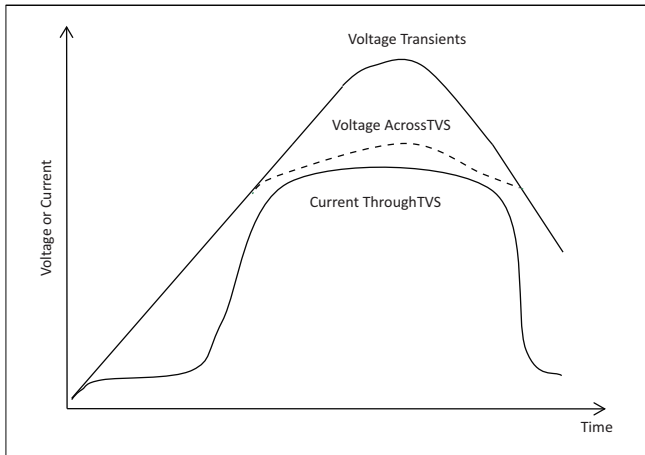


Figure 1 - TVS Transients Clamping Waveform

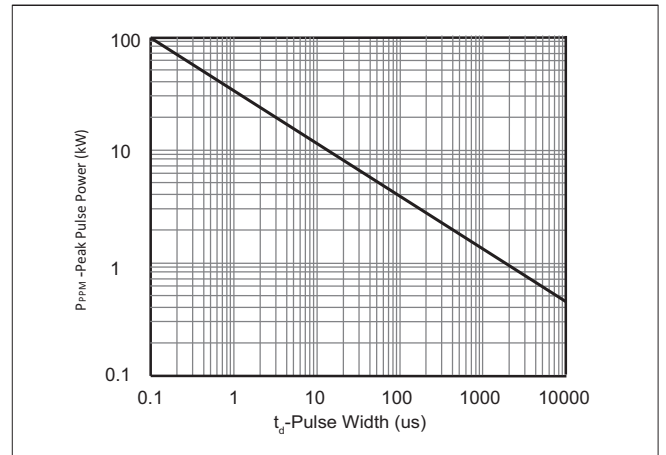


Figure 2 - Peak Pulse Power Rating Curve

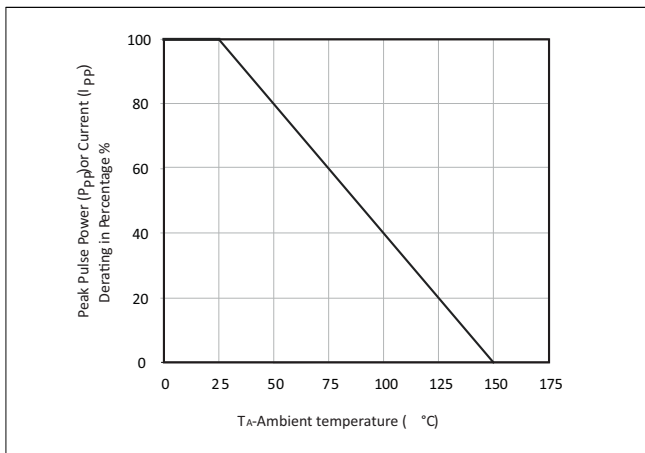


Figure 3 - Pulse Derating Curve

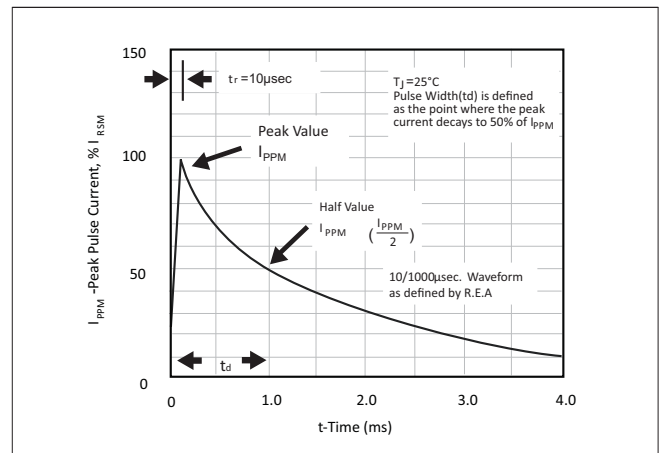


Figure 4 - Pulse Waveform

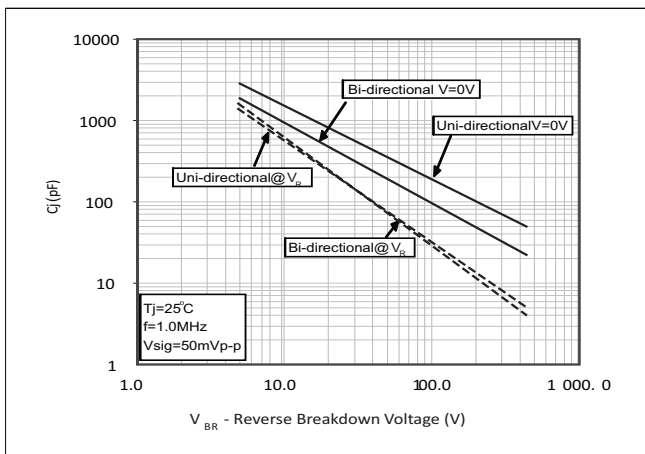


Figure 5 - Typical Junction Capacitance

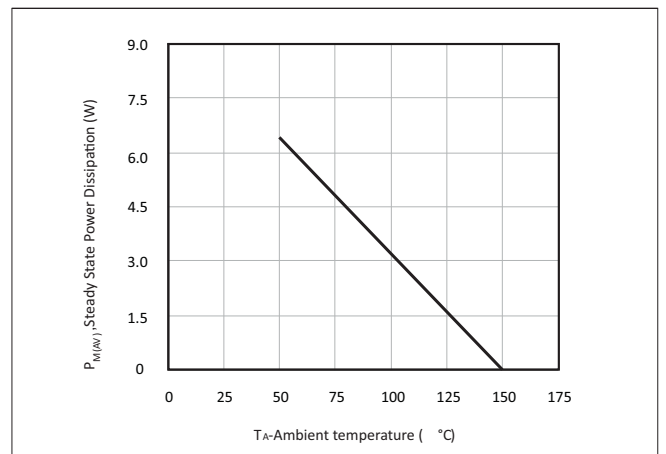
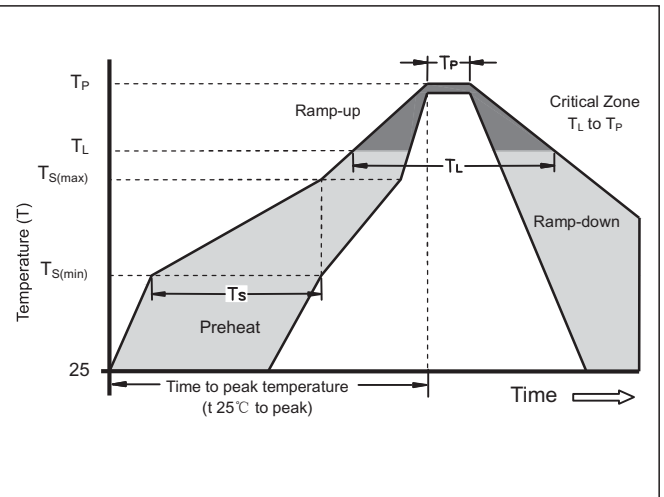


Figure 6 - Steady State Power Dissipation Derating Curve



### SOLDERING PARAMETERS

Reflow Condon		Lead-free assembly
Pre Heat	Temperature Min (Ts(min))	150°C
	Temperature Max (Ts(max))	200°C
	Time (min to max) (ts)	60–180 secs
Average ramp up rate (Liquidus Temp (TL) to peak)		3°C/second max
Ts(max)toTL- Ramp-up Rate		3°C/second max
Reflow	Temperature (TL) (Liquidus)	217°C
	Time (min to max) (tL)	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		280°C



### DO-214AB(SMC) PACKAGE DIMENSIONS

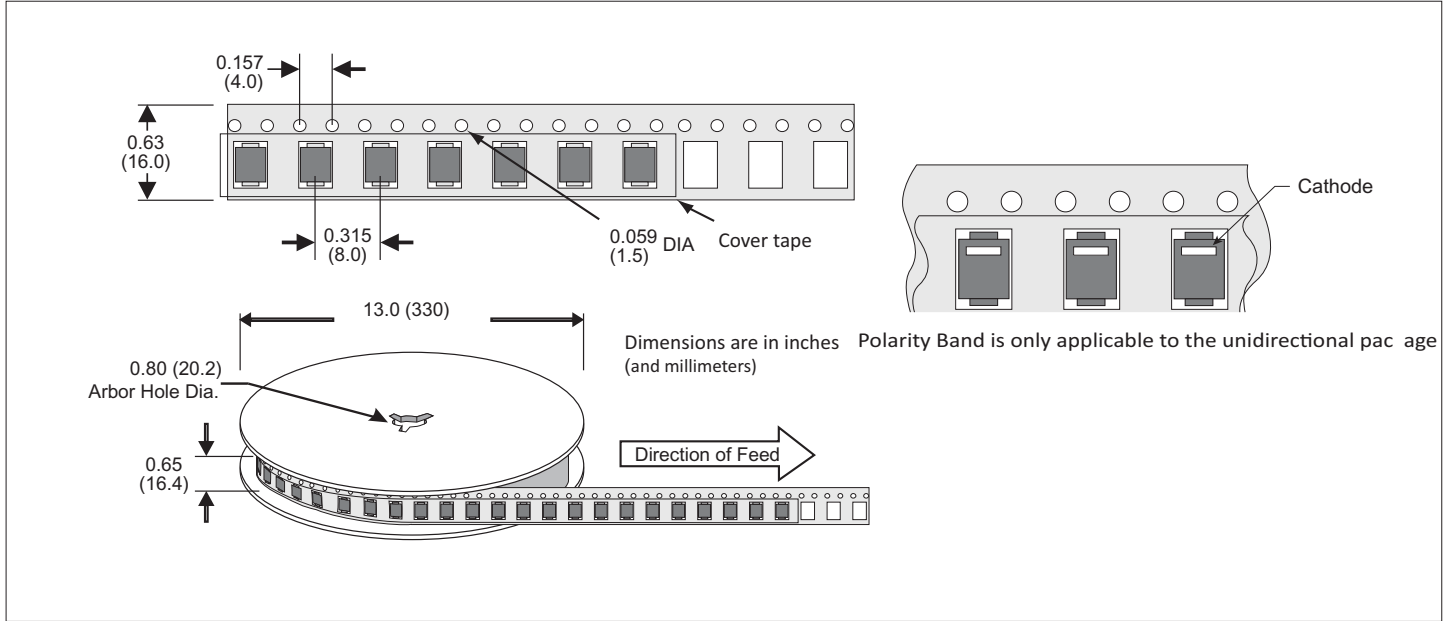
Item	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	6.50	7.40	0.256	0.291
D	5.50	6.25	0.217	0.246
D1	2.75	3.25	0.108	0.123
T	7.40	8.40	0.291	0.331
T1	0.90	1.52	0.035	0.060
d	-	0.20	-	0.008
s	2.10	2.70	0.083	0.106
t	0.152	0.31	0.006	0.012

**NOTES:**  
1. Dimensions are exclusive of mold flash and metal burrs  
2. Cathode Band is only applicable to the unidirectional pac age

### RECOMMENDED PAD LAYOUT DIMENSIONS

Item	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	3.300	-	0.129	-
B	2.400	-	0.094	-
C	-	4.200	-	0.165
D	2.400	-	0.094	-
E	8.13 REF		0.320 REF	

**TAPE AND REEL SPECIFICATION**



**ORDERING INFORMATION**

Part Number	Component Package	QTY/Reel	Reel Size
SMCJxx(C)A	DO-214AB(SMC)	3000PCS	13"

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