



## Features

- RoHS compliant\*
- Surface Mount SMC package
- Standoff Voltage: 5.0 to 170 volts
- Power Dissipation: 1500 watts

## Applications

- IEC 61000-4-2 ESD (Min. Level 4)
- IEC 61000-4-4 EFT
- IEC 61000-4-5 Surge

# SMCJ Transient Voltage Suppressor Diode Series

## General Information

The markets of portable communications, computing and video equipment are challenging the semiconductor industry to develop increasingly smaller electronic components.

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications, in compact chip package DO-214AB (SMC) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 5 V up to 170 V and Breakdown Voltage up to 200 V. Typical fast response times are less than 1.0 ns for unidirectional devices and less than 5.0 ns for bidirectional devices from 0 V to Minimum Breakdown Voltage.

Bourns® Chip Diodes conform to JEDEC standards, are easy to handle with standard pick and place equipment and the flat configuration minimizes roll away.

## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Value	Unit
Minimum Peak Pulse Power Dissipation (T <sub>p</sub> = 1 ms) (Note 1,2)	P <sub>PK</sub>	1500	Watts
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3)	I <sub>FSM</sub>	200	Amps
Steady State Power Dissipation @ T <sub>L</sub> = 75 °C	P <sub>M(AV)</sub>	5.0	Watts
Maximum Instantaneous Forward Voltage @ I <sub>PP</sub> = 100 A (For Unidirectional Units Only)	V <sub>F</sub>	(Note 5)	Volts
Operating Temperature Range	T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +175	°C

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T<sub>A</sub> = 25 °C per Pulse Derating Curve.
2. Thermal Resistance Junction to Lead.
3. 8.3 ms Single Half-Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).
4. Single Phase, Half Wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20 %.
5. V<sub>F</sub> = 3.5 V on SMCJ5.0A through SMCJ90A and V<sub>F</sub> = 5.0 V on SMCJ100A through SMCJ170A.



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## How to Order

**SMCJ 5.0 CA**

Package \_\_\_\_\_  
SMCJ = SMC/DO-214AB

Working Peak Reverse Voltage \_\_\_\_\_  
5.0 = 5.0 V<sub>RWM</sub> (Volts)

Suffix \_\_\_\_\_  
A = 5 % Tolerance Unidirectional Device  
CA = 5 % Tolerance Bidirectional Device

\*RoHS Directive 2002/95/EC Jan 27 2003 including Annex.  
Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

# SMCJ Transient Voltage Suppressor Diode Series

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## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Unidirectional Device		Bidirectional Device		Breakdown Voltage V <sub>BR</sub> (Volts)			Working Peak Reverse Voltage	Maximum Reverse Leakage @ V <sub>RWM</sub>	Maximum Reverse Voltage @ I <sub>RSM</sub>	Maximum Reverse Surge Current
Part Number	Part Marking	Part Number	Part Marking	Min.	Max.	@ I <sub>T</sub> (mA)	V <sub>RWM</sub> (Volts)	I <sub>R</sub> (μA)	V <sub>RSM</sub> (Volts)	I <sub>RSM</sub> (Amps)
SMCJ5.0A	GDE	SMCJ5.0CA	BDE	6.4	7.23	10	5	1000	9.2	163
SMCJ6.0A	GDG	SMCJ6.0CA	BDG	6.67	7.67	10	6	1000	10.3	145.6
SMCJ6.5A	GDK	SMCJ6.5CA	BDK	7.22	8.3	10	6.5	500	11.2	133.9
SMCJ7.0A	GDM	SMCJ7.0CA	BDM	7.78	8.95	10	7	200	12	125
SMCJ7.5A	GDP	SMCJ7.5CA	BDP	8.33	9.58	1	7.5	100	12.9	116.3
SMCJ8.0A	GDR	SMCJ8.0CA	BDR	8.89	10.2	1	8	50	13.6	110.3
SMCJ8.5A	GDT	SMCJ8.5CA	BDT	9.44	10.8	1	8.5	20	14.4	104.2
SMCJ9.0A	GDV	SMCJ9.0CA	BDV	10	11.5	1	9	10	15.4	97.4
SMCJ10A	GDX	SMCJ10CA	BDX	11.1	12.8	1	10	5	17	88.2
SMCJ11A	GDZ	SMCJ11CA	BDZ	12.2	14.4	1	11	5	18.2	82.4
SMCJ12A	GEE	SMCJ12CA	BEE	13.3	15.3	1	12	5	19.9	75.3
SMCJ13A	GEG	SMCJ13CA	BEG	14.4	16.5	1	13	5	21.5	69.7
SMCJ14A	GEK	SMCJ14CA	BEK	15.6	17.9	1	14	5	23.2	64.7
SMCJ15A	GEM	SMCJ15CA	BEM	16.7	19.2	1	15	5	24.4	61.5
SMCJ16A	GEP	SMCJ16CA	BEP	17.8	20.5	1	16	5	26	57.7
SMCJ17A	GER	SMCJ17CA	BER	18.9	21.7	1	17	5	27.6	53.3
SMCJ18A	GET	SMCJ18CA	BET	20	23.3	1	18	5	29.2	51.4
SMCJ20A	GEV	SMCJ20CA	BEV	22.2	25.5	1	20	5	32.4	46.3
SMCJ22A	GEX	SMCJ22CA	BEX	24.4	28	1	22	5	35.5	42.2
SMCJ24A	GEZ	SMCJ24CA	BEZ	26.7	30.7	1	24	5	38.9	38.6
SMCJ26A	GFE	SMCJ26CA	BFE	28.9	32.2	1	26	5	42.1	35.6
SMCJ28A	GFG	SMCJ28CA	BFG	31.1	35.8	1	28	5	45.4	33
SMCJ30A	GFK	SMCJ30CA	BFK	33.3	38.3	1	30	5	48.4	31
SMCJ33A	GFM	SMCJ33CA	BFM	36.7	42.2	1	33	5	53.3	28.1
SMCJ36A	GFP	SMCJ36CA	BFP	40	46	1	36	5	58.1	25.8
SMCJ40A	GFR	SMCJ40CA	BFR	44.4	51.1	1	40	5	64.5	23.3
SMCJ43A	GFT	SMCJ43CA	BFT	47.8	54.9	1	43	5	69.4	21.6
SMCJ45A	GFV	SMCJ45CA	BFV	50	57.5	1	45	5	72.7	20.6
SMCJ48A	GFX	SMCJ48CA	BFX	53.3	61.3	1	48	5	77.4	19.4
SMCJ51A	GFZ	SMCJ51CA	BFZ	56.7	65.2	1	51	5	82.4	18.2
SMCJ54A	GGE	SMCJ54CA	BGE	60	69	1	54	5	87.1	17.2
SMCJ58A	GGG	SMCJ58CA	BGG	64.4	74.6	1	58	5	93.6	16
SMCJ60A	GGK	SMCJ60CA	BGK	66.7	76.7	1	60	5	96.8	15.5
SMCJ64A	GGM	SMCJ64CA	BGM	71.1	81.8	1	64	5	103	14.6
SMCJ70A	GGP	SMCJ70CA	BGP	77.8	89.5	1	70	5	113	13.3
SMCJ75A	GGR	SMCJ75CA	BGR	83.3	95.8	1	75	5	121	12.4
SMCJ78A	GGT	SMCJ78CA	BGT	86.7	99.7	1	78	5	126	11.4
SMCJ85A	GGV	SMCJ85CA	BGV	94.4	108.2	1	85	5	137	10.4
SMCJ90A	GGX	SMCJ90CA	BGX	100	115.5	1	90	5	146	10.3
SMCJ100A	GGZ	SMCJ100CA	BGZ	111	128	1	100	5	162	9.3
SMCJ110A	GHE	SMCJ110CA	BHE	122	140	1	110	5	177	8.4
SMCJ120A	GHG	SMCJ120CA	BHG	133	153	1	120	5	193	7.9
SMCJ130A	GHK	SMCJ130CA	BHK	144	165	1	130	5	209	7.2
SMCJ150A	GHM	SMCJ150CA	BHM	167	192	1	150	5	243	6.2
SMCJ160A	GHP	SMCJ160CA	BHP	178	205	1	160	5	259	5.8
SMCJ170A	GHR	SMCJ170CA	BHR	189	217.5	1	170	5	275	5.5

### Notes:

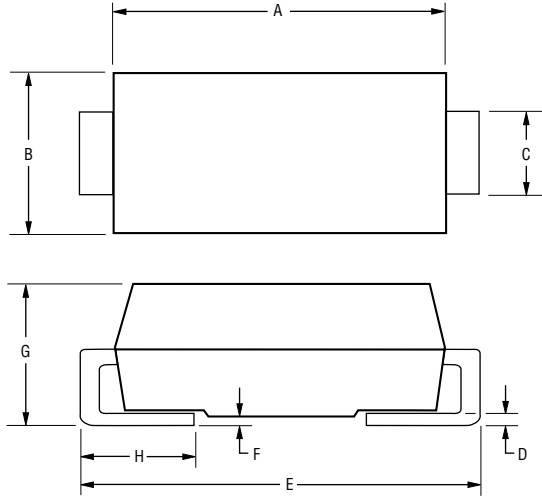
- Suffix 'A' denotes a 5 % tolerance unidirectional device.
- Suffix 'CA' denotes a 5 % tolerance bidirectional device.
- For bidirectional devices with a V<sub>R</sub> of 10 volts or less, the I<sub>R</sub> limit is double.
- For unidirectional devices with a V<sub>F</sub> max. of 3.5 V at an I<sub>F</sub> of 35 A, 0.5 Sine Wave of 8.3 ms Pulse Width.

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# SMCJ Transient Voltage Suppressor Diode Series

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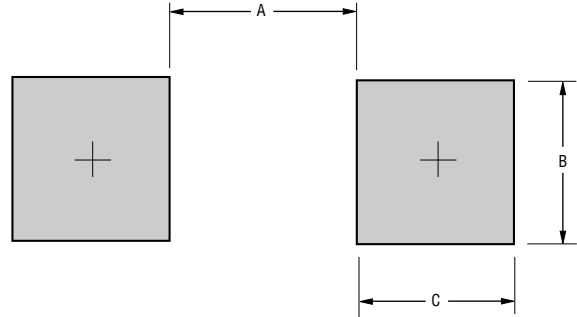
## Product Dimensions



Dimension	SMC (DO-214AB)
A	$\frac{6.60 - 7.11}{(0.260 - 0.280)}$
B	$\frac{5.59 - 6.22}{(0.220 - 0.245)}$
C	$\frac{2.92 - 3.18}{(0.115 - 0.125)}$
D	$\frac{0.15 - 0.31}{(0.006 - 0.112)}$
E	$\frac{7.75 - 8.13}{(0.305 - 0.320)}$
F	$\frac{0.05 - 0.20}{(0.002 - 0.008)}$
G	$\frac{2.01 - 2.62}{(0.080 - 0.103)}$
H	$\frac{0.76 - 1.52}{(0.030 - 0.060)}$

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## Recommended Footprint



Dimension	SMC (DO-214AB)
A (Max.)	$\frac{4.69}{(0.185)}$
B (Min.)	$\frac{3.07}{(0.121)}$
C (Min.)	$\frac{1.52}{(0.060)}$

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## Physical Specifications

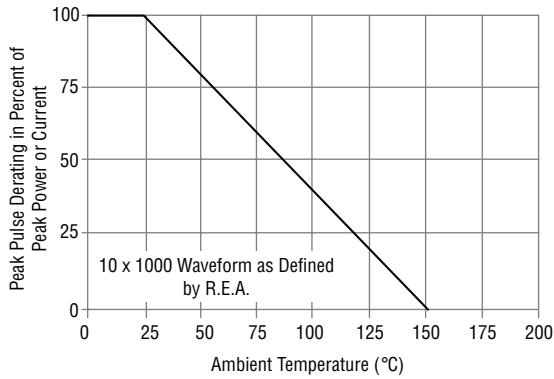
Case .....Molded plastic per UL Class 94V-0  
 Polarity ..... Cathode band indicates unidirectional device  
                     No cathode band indicates bidirectional device  
 Weight .....0.007 ounces / 0.21 grams

# SMCJ Transient Voltage Suppressor Diode Series

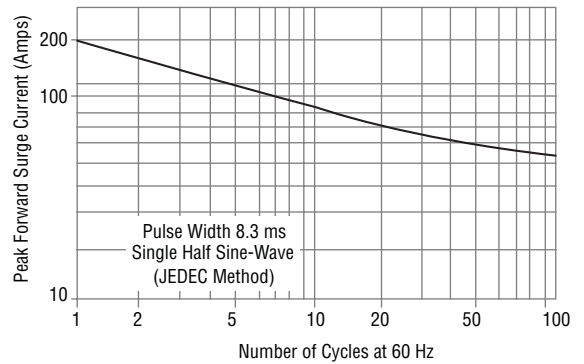
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## Rating & Characteristic Curves

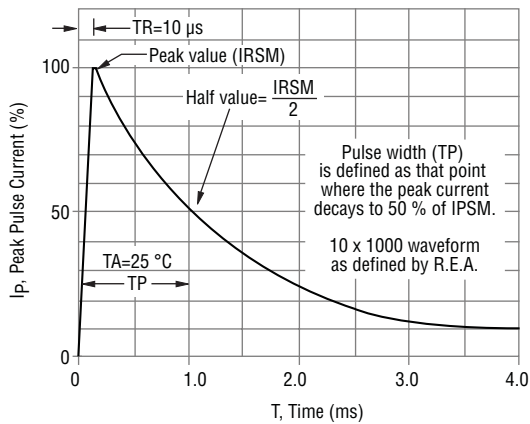
### Pulse Derating Curve



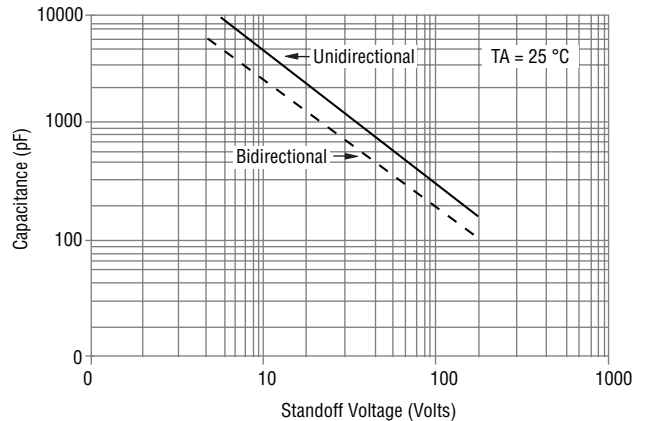
### Maximum Non-Repetitive Surge Current



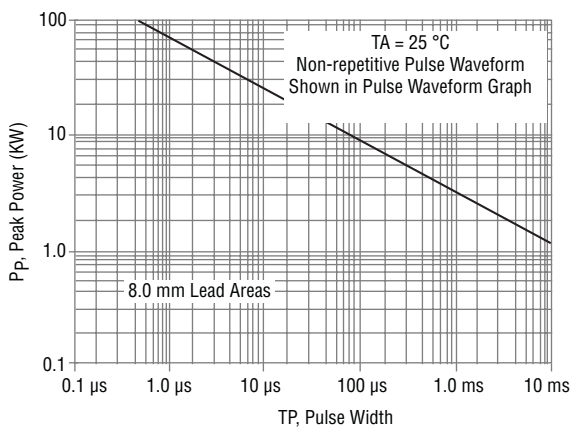
### Pulse Waveform



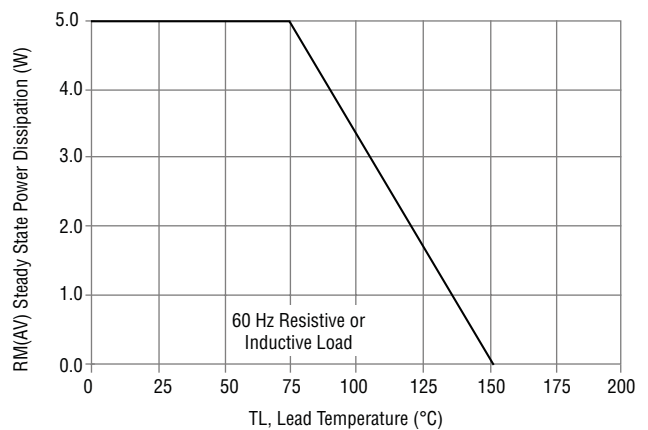
### Typical Junction Capacitance



### Pulse Rating Curve



### Steady State Power Derating Curve



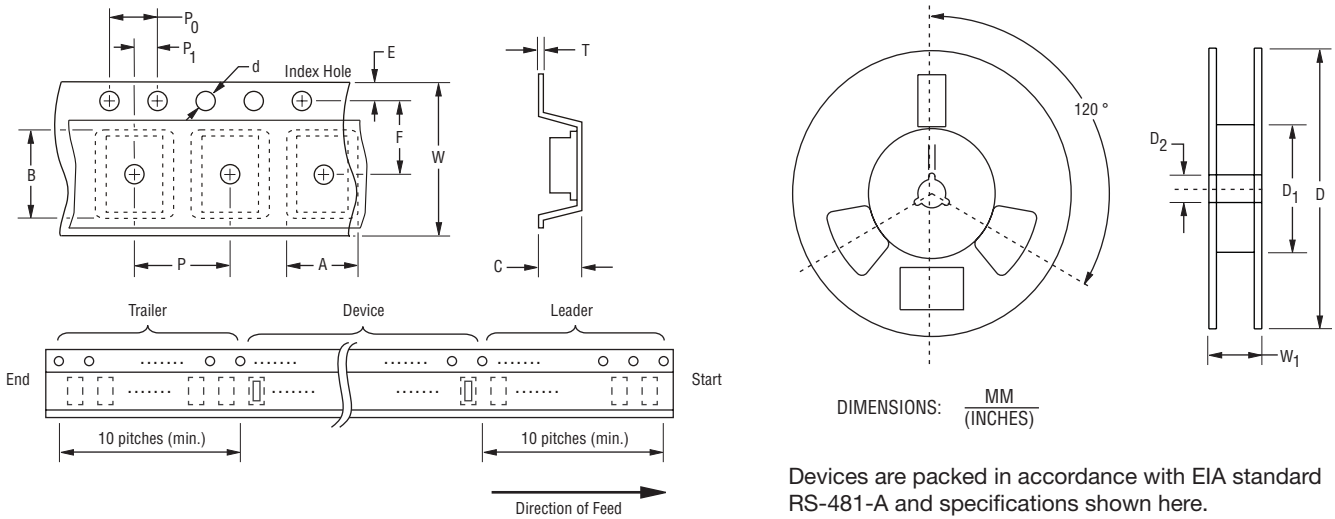
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# SMCJ Transient Voltage Suppressor Diode Series

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## Packaging Information

The product will be dispensed in tape and reel format (see diagram below).



Item	Symbol	SMC (DO-214AB)
Carrier Width	A	$\frac{7.22 \pm 0.10}{(0.284 - 0.004)}$
Carrier Length	B	$\frac{8.11 \pm 0.10}{(0.319 \pm 0.004)}$
Carrier Depth	C	$\frac{2.36 \pm 0.10}{(0.093 \pm 0.004)}$
Sprocket Hole	d	$\frac{1.55 \pm 0.05}{(0.061 \pm 0.002)}$
Reel Outside Diameter	D	$\frac{330}{(12.992)}$
Reel Inner Diameter	D <sub>1</sub>	$\frac{50.0}{(1.969)}$ MIN.
Feed Hole Diameter	D <sub>2</sub>	$\frac{13.0 \pm 0.20}{(0.512 \pm 0.008)}$
Sprocket Hole Position	E	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$
Punch Hole Position	F	$\frac{7.50 \pm 0.05}{(0.295 \pm 0.002)}$
Punch Hole Pitch	P	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$
Sprocket Hole Pitch	P <sub>0</sub>	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$
Embossment Center	P <sub>1</sub>	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$
Overall Tape Thickness	T	$\frac{0.30 \pm 0.10}{(0.012 \pm 0.004)}$
Tape Width	W	$\frac{16.00 \pm 0.20}{(0.630 \pm 0.008)}$
Reel Width	W <sub>1</sub>	$\frac{22.4}{(0.882)}$ MAX.
Quantity per Reel	--	3,000