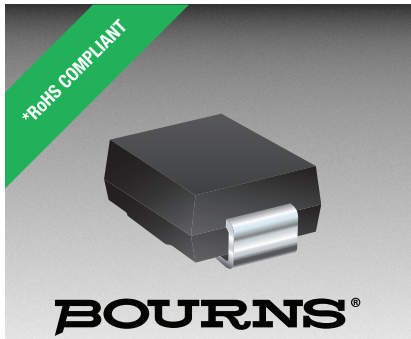




Features

- RoHS compliant* and halogen free**
- Surface mount SMC package
- Standoff voltage: 5 to 170 volts
- Peak Pulse Power: 5000 watts
- Typical temperature coefficient:
 $\Delta V_{BR} = 0.1 \% \times V_{BR} @ 25^{\circ}C \times \Delta T$

5.0SMDJ Transient Voltage Suppressor Diode Series

General Information

Portable communications, computing and video equipment manufacturers are challenging the semiconductor industry to develop increasingly higher power density circuit protection 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 209 V. Typical fast response times are less than 1.0 ps from 0 V to 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.

Additional Information

Click these links for more information:



Agency Recognition

Description	
UL	File Number: E153537

Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Value	Unit
Minimum Peak Pulse Power Dissipation (T _p = 1 ms) (Note 1,2)	P _{PK}	5000	Watts
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3,4)	I _{FSM}	300	Amps
Steady State Power Dissipation @ T _L = 50 °C	P _{M(AV)}	6.5	Watts
Maximum Instantaneous Forward Voltage @ I _{PP} = 100 A (For Unidirectional Units Only)	V _F	5	Volts
Operating Temperature Range	T _J	-55 to +150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T_A = 25 °C per Pulse Derating Curve.
2. Thermal Resistance Junction to Lead.
3. 8.3 ms Single Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).
4. Mounted on 8.0 mm x 8.0 mm copper pad area to each terminal.

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The Americas: Tel: +1-951 781-5500 • Email: americus@bourns.com

www.bourns.com

How to Order

5.0SMDJ 12 CA - H

Package _____
 5.0SMDJ = SMC/DO-214AB

Working Peak Reverse Voltage _____
 12 = 12 V_{RWM} (Volts)

Suffix _____
 A = 5 % Tolerance Unidirectional Device
 CA = 5 % Tolerance Bidirectional Device

Reel _____
 (Blank) = 13-inch Reel
 -H = 7-inch Reel



CALIFORNIA WARNING: Can expose you to lead, a carcinogen and reproductive toxicant.
 See www.P65Warnings.ca.gov

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

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5.0SMDJ Transient Voltage Suppressor Diode Series

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Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

Unidirectional Device		Bidirectional Device		Breakdown Voltage V _{BR} (Volts)			Reverse Standoff Voltage	Maximum Reverse Leakage @ V _{RWM}	Maximum Clamping Voltage @ I _{pp} (10/1000 μs)	Maximum Peak Pulse Current (10/1000 μs)	Maximum Clamping Voltage @ I _{pp} (8/20 μs)	Maximum Peak Pulse Current (8/20 μs)
Part Number	Part Marking	Part Number	Part Marking	Min.	Max.	@ I _T (mA)	V _{RWM} (V)	I _R (μA)	V _c (V)	I _{pp} (A)	V _c (V)	I _{pp} (A)
5.0SMDJ5.0A	5RDE	5.0SMDJ5.0CA	5DDE	6.40	7.00	10	5.0	1050	9.2	543.6	12.0	2718.0
5.0SMDJ6.0A	5RDG	5.0SMDJ6.0CA	5DDG	6.67	7.37	10	6.0	1050	10.3	485.5	13.4	2427.5
5.0SMDJ6.5A	5RDK	5.0SMDJ6.5CA	5DDK	7.22	7.98	10	6.5	750	11.2	446.5	14.6	2232.5
5.0SMDJ7.0A	5PDM	5.0SMDJ7.0CA	5DDM	7.78	8.60	10	7.0	300	12.0	416.8	15.6	2084.0
5.0SMDJ7.5A	5PDP	5.0SMDJ7.5CA	5DDP	8.33	9.21	1	7.5	150	12.9	387.7	16.8	1938.5
5.0SMDJ8.0A	5PDR	5.0SMDJ8.0CA	5DDR	8.89	9.83	1	8.0	70	13.6	367.7	17.7	1838.5
5.0SMDJ8.5A	5PDT	5.0SMDJ8.5CA	5DDT	9.44	10.40	1	8.5	30	14.4	347.3	18.7	1736.5
5.0SMDJ9.0A	5PDV	5.0SMDJ9.0CA	5DDV	10.00	11.10	1	9.0	12	15.4	324.8	20.0	1624.0
5.0SMDJ10A	5PDX	5.0SMDJ10CA	5DDX	11.10	12.30	1	10.0	6	17.0	294.2	22.1	1471.0
5.0SMDJ11A	5PDZ	5.0SMDJ11CA	5DDZ	12.20	13.50	1	11.0	2	18.2	274.8	23.7	1374.0
5.0SMDJ12A	5PEP	5.0SMDJ12CA	5BEP	13.30	14.70	1	12.0	2	19.9	252.0	25.9	1260.0
5.0SMDJ13A	5PEQ	5.0SMDJ13CA	5BEQ	14.40	15.90	1	13.0	2	21.5	233.0	28.0	1165.0
5.0SMDJ14A	5PER	5.0SMDJ14CA	5BER	15.60	17.20	1	14.0	2	23.2	216.0	30.2	1080.0
5.0SMDJ15A	5PES	5.0SMDJ15CA	5BES	16.70	18.50	1	15.0	2	24.4	205.0	31.7	1025.0
5.0SMDJ16A	5PET	5.0SMDJ16CA	5BET	17.80	19.70	1	16.0	2	26.0	193.0	33.8	965.0
5.0SMDJ17A	5PEU	5.0SMDJ17CA	5BEU	18.90	20.90	1	17.0	2	27.6	181.0	35.9	905.0
5.0SMDJ18A	5PEV	5.0SMDJ18CA	5BEV	20.00	22.10	1	18.0	2	29.2	172.0	38.0	860.0
5.0SMDJ20A	5PEW	5.0SMDJ20CA	5BEW	22.20	24.50	1	20.0	2	32.4	155.0	42.1	775.0
5.0SMDJ22A	5PEX	5.0SMDJ22CA	5BEX	24.40	26.90	1	22.0	2	35.5	141.0	46.2	705.0
5.0SMDJ24A	5PEZ	5.0SMDJ24CA	5BEZ	26.70	29.50	1	24.0	2	38.9	129.0	50.6	645.0
5.0SMDJ26A	5PFE	5.0SMDJ26CA	5BFE	28.90	31.90	1	26.0	2	42.1	119.0	54.7	595.0
5.0SMDJ28A	5PFG	5.0SMDJ28CA	5BFG	31.10	34.40	1	28.0	2	45.4	110.0	59.0	550.0
5.0SMDJ30A	5PFK	5.0SMDJ30CA	5BFK	33.30	36.80	1	30.0	2	48.4	103.0	62.9	515.0
5.0SMDJ33A	5PFM	5.0SMDJ33CA	5BFM	36.70	40.60	1	33.0	2	53.3	93.9	69.3	469.5
5.0SMDJ36A	5PFP	5.0SMDJ36CA	5BFP	40.00	44.20	1	36.0	2	58.1	86.1	75.5	430.5
5.0SMDJ40A	5PFR	5.0SMDJ40CA	5BFR	44.40	49.10	1	40.0	2	64.5	77.6	83.9	388.0
5.0SMDJ43A	5PFT	5.0SMDJ43CA	5BFT	47.80	52.80	1	43.0	2	69.4	72.1	90.2	360.5
5.0SMDJ45A	5PFV	5.0SMDJ45CA	5BFV	50.00	55.30	1	45.0	2	72.7	68.8	94.5	344.0
5.0SMDJ48A	5PFX	5.0SMDJ48CA	5BFX	53.30	58.90	1	48.0	2	77.4	64.7	100.6	323.5
5.0SMDJ51A	5PFZ	5.0SMDJ51CA	5BFZ	56.70	62.70	1	51.0	2	82.4	60.7	107.1	303.5
5.0SMDJ54A	5RGE	5.0SMDJ54CA	5BGE	60.00	66.30	1	54.0	2	87.1	57.5	113.2	287.5
5.0SMDJ58A	5PGG	5.0SMDJ58CA	5BGG	64.40	71.20	1	58.0	2	93.6	53.5	121.7	267.5
5.0SMDJ60A	5PGK	5.0SMDJ60CA	5BGK	66.70	73.70	1	60.0	2	96.8	51.7	125.8	258.5
5.0SMDJ64A	5PGM	5.0SMDJ64CA	5BGM	71.10	78.60	1	64.0	2	103.0	48.6	133.9	243.0
5.0SMDJ70A	5PGP	5.0SMDJ70CA	5BGP	77.80	86.00	1	70.0	2	113.0	44.3	146.9	221.5
5.0SMDJ75A	5PGR	5.0SMDJ75CA	5BGR	83.30	92.10	1	75.0	2	121.0	41.4	157.3	207.0
5.0SMDJ78A	5PGT	5.0SMDJ78CA	5BGT	86.70	95.80	1	78.0	2	126.0	39.7	163.8	198.5
5.0SMDJ85A	5PGV	5.0SMDJ85CA	5BGV	94.40	104.00	1	85.0	2	137.0	36.5	178.1	182.5
5.0SMDJ90A	5PGX			100.00	111.00	1	90.0	2	146.0	34.3	189.8	171.5
5.0SMDJ100A	5PGZ			111.00	123.00	1	100.0	2	162.0	30.9	210.6	154.5
5.0SMDJ110A	5PHE			122.00	135.00	1	110.0	2	177.0	28.3	230.1	141.5
5.0SMDJ120A	5PHG			133.00	147.00	1	120.0	2	193.0	26.0	250.9	130.0
5.0SMDJ130A	5PHK			144.00	159.00	1	130.0	2	209.0	24.0	271.7	120.0
5.0SMDJ150A	5PHM			167.00	185.00	1	150.0	2	243.0	20.6	315.9	103.0
5.0SMDJ160A	5PHP			178.00	197.00	1	160.0	2	259.0	19.3	336.7	96.5
5.0SMDJ170A	5PHR			189.00	209.00	1	170.0	2	275.0	18.2	357.5	91.0

Specifications are subject to change without notice.

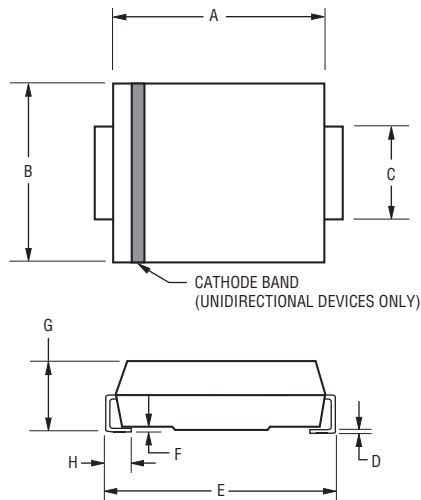
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5.0SMDJ Transient Voltage Suppressor Diode Series

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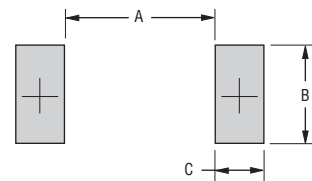
Product Dimensions



Dimension	SMC (DO-214AB)
A	6.60 - 7.11 (0.260 - 0.280)
B	5.59 - 6.22 (0.220 - 0.245)
C	2.90 - 3.20 (0.114 - 0.126)
D	0.15 - 0.31 (0.006 - 0.012)
E	7.75 - 8.13 (0.305 - 0.320)
F	0.05 - 0.20 (0.002 - 0.008)
G	2.01 - 2.62 (0.080 - 0.103)
H	0.76 - 1.52 (0.030 - 0.060)

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

Recommended Footprint



Dimension	SMC (DO-214AB)
A (Max.)	4.69 (0.185)
B (Min.)	3.07 (0.121)
C (Min.)	1.53 (0.060)

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

Physical Specifications

Encapsulation Molded plastic per UL Class 94V-0
 Polarity Cathode band indicates unidirectional device
 No cathode band indicates bidirectional device

Environmental Specifications

Moisture Sensitivity Level 1
 ESD Classification (HBM) 3B

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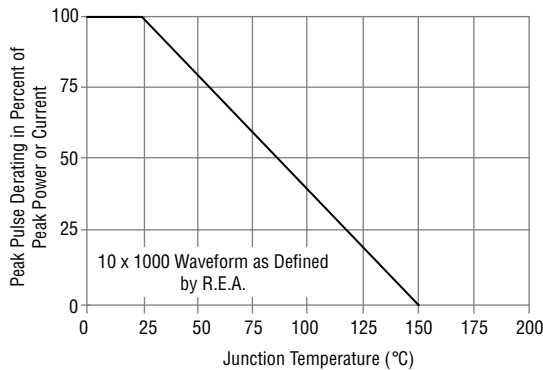
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5.0SMDJ Transient Voltage Suppressor Diode Series

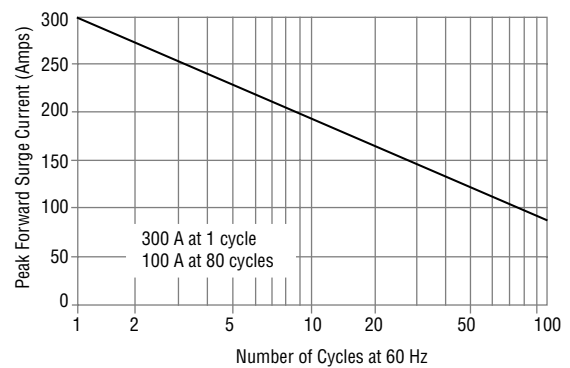
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Rating & Characteristic Curves

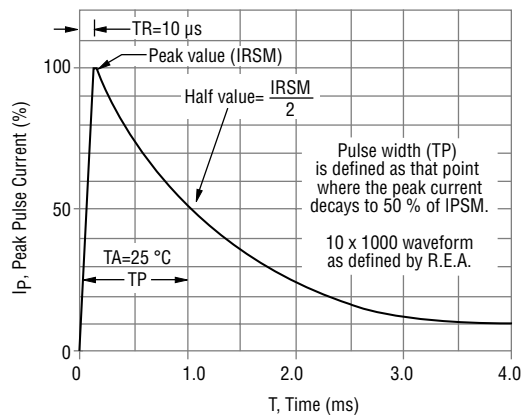
Pulse Derating Curve



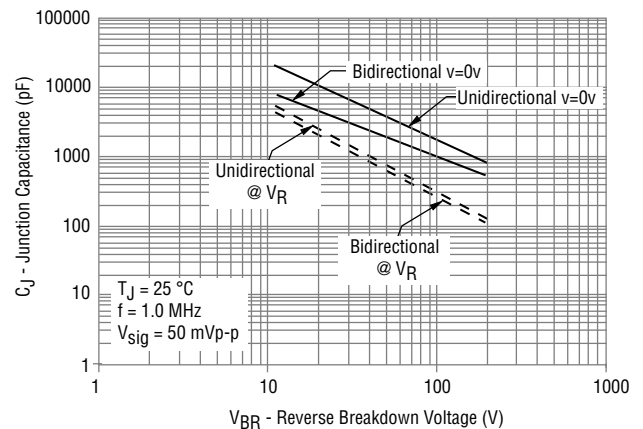
Maximum Non-Repetitive Surge Current



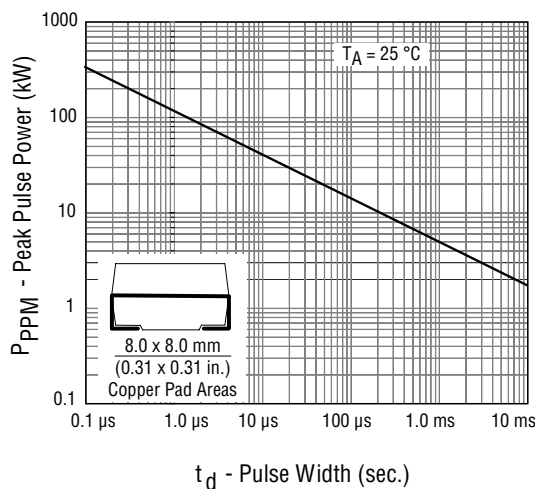
Pulse Waveform



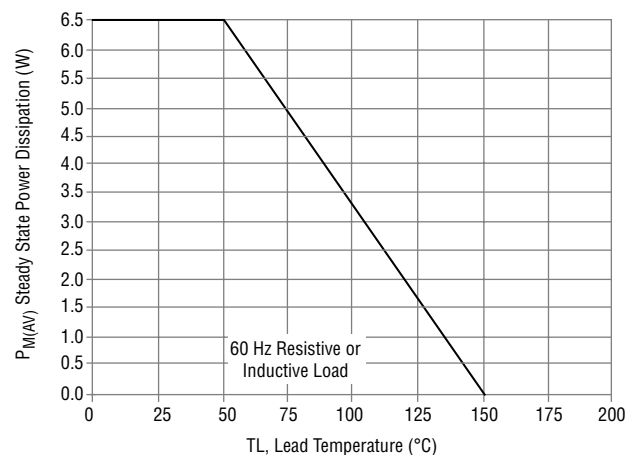
Typical Junction Capacitance



Pulse Rating Curve



Steady State Power Derating Curve



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



Devices are packed in accordance with EIA standard EIA-481-D and specifications shown here.

Item	Symbol	SMC (DO-214AB)	
		7-Inch Reel	13-Inch Reel
Carrier Width	A	$\frac{6.0 \pm 0.20}{(0.236 \pm 0.079)}$	
Carrier Length	B	$\frac{8.3 \pm 0.20}{(0.327 \pm 0.008)}$	
Carrier Depth	C	$\frac{2.5 \pm 0.20}{(0.098 \pm 0.008)}$	
Sprocket Hole	d	$\frac{1.50 \pm 0.10}{(0.059 \pm 0.004)}$	
Reel Outside Diameter	D	$\frac{178}{(7.008)}$	$\frac{330}{(12.992)}$
Reel Inner Diameter	D ₁	$\frac{50.0}{(1.969)} \text{ MIN.}$	
Feed Hole Diameter	D ₂	$\frac{13.0 +0.50/-0.20}{(0.512 +0.020/-0.008)}$	
Sprocket Hole Position	E	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$	
Punch Hole Position	F	$\frac{7.50 \pm 0.10}{(0.295 \pm 0.004)}$	
Punch Hole Pitch	P	$\frac{8.00 \pm 0.10}{(0.315 \pm 0.004)}$	
Sprocket Hole Pitch	P ₀	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	
Embossment Center	P ₁	$\frac{2.00 \pm 0.10}{(0.079 \pm 0.004)}$	
Overall Tape Thickness	T	$\frac{0.30 \pm 0.10}{(0.012 \pm 0.004)}$	
Tape Width	W	$\frac{16.00 \pm 0.30}{(0.630 \pm 0.012)}$	
Reel Width	W ₁	$\frac{22.4}{(0.882)} \text{ MAX.}$	
Quantity per Reel	--	500	3,000

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Unless Bourns has explicitly designated an individual Bourns® product as meeting the requirements of a particular industry standard (e.g., IATF 16949) or a particular qualification (e.g., UL listed or recognized), Bourns is not responsible for any failure of an individual Bourns® product to meet the requirements of such industry standard or particular qualification even if such industry standard or qualification is a "state of art". Users of Bourns® products are responsible for ensuring compliance with safety-related requirements and standards applicable to their devices or applications.

Bourns® products are not recommended, authorized or intended for use in applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage, such as without limitation nuclear, life-critical medical and certain automotive and aviation applications. Except as set forth in the bullet points below or unless expressly and specifically approved in writing on a case-by-case basis by an authorized Bourns' representative, use of any Bourns® products in such unauthorized high-risk applications is at the user's sole risk.

- Bourns considers implantable/invasive devices and devices/procedures designed as life-supporting or life-sustaining by the U.S. Food and Drug Administration or equivalent organizations outside of the United States as "life-critical" medical applications. Bourns expressly identifies those Bourns® standard products that are suitable for use in typical medical applications that are not life-critical in its publication entitled "Bourns Medical Grade Component Guide."
- Bourns expressly identifies those Bourns® standard products that are suitable for use in typical automotive applications associated with any Automate Safety Integrity Level (ASIL) in its publication entitled "Bourns Automotive Grade Component Guide." Bourns' designation of Bourns® product as compliant with the AEC-Q standard does not by itself mean that Bourns has approved such product for use in an automotive application.
- Bourns expressly identifies Bourns® standard products that are suitable for use in the typical aviation applications/systems requiring System Design Assurance Level (RTCA DO-254 DAL) of C, D or E in its publication entitled "Bourns Civilian Aerospace/Aviation Grade Component Guide." Bourns does not test its products for compliance with United States Federal Aviation Administration standards or any other generally equivalent governmental organization standard applicable to products designed or manufactured for use in aviation applications. Use of Bourns® standard components in aviation applications associated with RTCA DO-254 DAL A or B without proper approval noted above shall be at the user's sole risk.
- Bourns will review and authorize on a case-by-case basis the use of Bourns® standard products which are at least AEC-Q compliant in space-related civil applications (rockets, satellites) with a negotiated cross-waiver and indemnity agreement.

The use and level of testing applicable to Bourns® custom products shall be negotiated on a case-by-case basis by Bourns and the user for which such Bourns® custom products are specially designed. Absent a written agreement between Bourns and the user regarding the use and level of such testing, the above provisions applicable to Bourns® standard products shall also apply to such Bourns® custom products.

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