




Features

- RoHS compliant* and halogen free**
- Surface mount SMC package
- Standoff voltage: 5 to 170 volts
- Peak Pulse Power: 5000 watts
- AEC-Q101 compliant***
- UL Recognized 

Applications

- Protection of power buses
- Protection of I/O interfaces
- Overvoltage transient protection
- Telecom, computer, industrial and consumer electronics applications

5.0SMDJ-Q Transient Voltage Suppressor Diode Series

General Information

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 189 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.

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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How to Order

Package	5.0SMDJ	12	CA - Q
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		
AEC-Q101 Compliant Suffix	Q = AEC-Q101 Compliant, 3000 pcs. per 13-inch Reel QH = AEC-Q101 Compliant, 500 pcs. per 7-inch Reel, 3 Reels per Box		



WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

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

** Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

*** Q suffix for automotive and other applications requiring appropriate AEC-Q101 compliance for electronic limiters.

Specifications are subject to change without notice.

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5.0SMDJ-Q 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}	Peak Pulse Current
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)
5.0SMDJ5.0A-Q	5RDEQ	5.0SMDJ5.0CA-Q	5DDEQ	6.40	7.00	10	5.0	1050	9.2	543.6
5.0SMDJ6.0A-Q	5RDGQ	5.0SMDJ6.0CA-Q	5DDGQ	6.67	7.37	10	6.0	1050	10.3	485.5
5.0SMDJ6.5A-Q	5RDKQ	5.0SMDJ6.5CA-Q	5DDKQ	7.22	7.98	10	6.5	750	11.2	446.5
5.0SMDJ7.0A-Q	5PDMQ	5.0SMDJ7.0CA-Q	5DDMQ	7.78	8.60	10	7.0	300	12.0	416.8
5.0SMDJ7.5A-Q	5PDPQ	5.0SMDJ7.5CA-Q	5DDPQ	8.33	9.21	1	7.5	150	12.9	387.7
5.0SMDJ8.0A-Q	5PDRQ	5.0SMDJ8.0CA-Q	5DDRQ	8.89	9.83	1	8.0	70	13.6	367.7
5.0SMDJ8.5A-Q	5PDTQ	5.0SMDJ8.5CA-Q	5DDTQ	9.44	10.40	1	8.5	30	14.4	347.3
5.0SMDJ9.0A-Q	5PDVQ	5.0SMDJ9.0CA-Q	5DDVQ	10.00	11.10	1	9.0	12	15.4	324.8
5.0SMDJ10A-Q	5PDXQ	5.0SMDJ10CA-Q	5DDXQ	11.10	12.30	1	10.0	6	17.0	294.2
5.0SMDJ11A-Q	5PDZQ	5.0SMDJ11CA-Q	5DDZQ	12.20	13.50	1	11.0	2	18.2	274.8
5.0SMDJ12A-Q	5PEPQ	5.0SMDJ12CA-Q	5BEPQ	13.30	14.70	1	12.0	2	19.9	252.0
5.0SMDJ13A-Q	5PEQQ	5.0SMDJ13CA-Q	5BEQQ	14.40	15.90	1	13.0	2	21.5	233.0
5.0SMDJ14A-Q	5PERQ	5.0SMDJ14CA-Q	5BERQ	15.60	17.20	1	14.0	2	23.2	216.0
5.0SMDJ15A-Q	5PESQ	5.0SMDJ15CA-Q	5BESQ	16.70	18.50	1	15.0	2	24.4	205.0
5.0SMDJ16A-Q	5PETQ	5.0SMDJ16CA-Q	5BETQ	17.80	19.70	1	16.0	2	26.0	193.0
5.0SMDJ17A-Q	5PEUQ	5.0SMDJ17CA-Q	5BEUQ	18.90	20.90	1	17.0	2	27.6	181.0
5.0SMDJ18A-Q	5PEVQ	5.0SMDJ18CA-Q	5BEVQ	20.00	22.10	1	18.0	2	29.2	172.0
5.0SMDJ20A-Q	5PEWQ	5.0SMDJ20CA-Q	5BEWQ	22.20	24.50	1	20.0	2	32.4	155.0
5.0SMDJ22A-Q	5PEXQ	5.0SMDJ22CA-Q	5BEXQ	24.40	26.90	1	22.0	2	35.5	141.0
5.0SMDJ24A-Q	5PEZQ	5.0SMDJ24CA-Q	5BEZQ	26.70	29.50	1	24.0	2	38.9	129.0
5.0SMDJ26A-Q	5PFEQ	5.0SMDJ26CA-Q	5BFEQ	28.90	31.90	1	26.0	2	42.1	119.0
5.0SMDJ28A-Q	5PFGQ	5.0SMDJ28CA-Q	5BFGQ	31.10	34.40	1	28.0	2	45.4	110.0
5.0SMDJ30A-Q	5PFKQ	5.0SMDJ30CA-Q	5BFKQ	33.30	36.80	1	30.0	2	48.4	103.0
5.0SMDJ33A-Q	5PFMQ	5.0SMDJ33CA-Q	5BFMQ	36.70	40.60	1	33.0	2	53.3	93.9
5.0SMDJ36A-Q	5PFPQ	5.0SMDJ36CA-Q	5BFPQ	40.00	44.20	1	36.0	2	58.1	86.1
5.0SMDJ40A-Q	5PFRQ	5.0SMDJ40CA-Q	5BFRQ	44.40	49.10	1	40.0	2	64.5	77.6
5.0SMDJ43A-Q	5PFTQ	5.0SMDJ43CA-Q	5BFTQ	47.80	52.80	1	43.0	2	69.4	72.1
5.0SMDJ45A-Q	5PFVQ	5.0SMDJ45CA-Q	5BFVQ	50.00	55.30	1	45.0	2	72.7	68.8
5.0SMDJ48A-Q	5PFXQ	5.0SMDJ48CA-Q	5BFXQ	53.30	58.90	1	48.0	2	77.4	64.7
5.0SMDJ51A-Q	5PFZQ	5.0SMDJ51CA-Q	5BFZQ	56.70	62.70	1	51.0	2	82.4	60.7
5.0SMDJ54A-Q	5RGEQ	5.0SMDJ54CA-Q	5BGEQ	60.00	66.30	1	54.0	2	87.1	57.5
5.0SMDJ58A-Q	5PGGQ	5.0SMDJ58CA-Q	5BGGQ	64.40	71.20	1	58.0	2	93.6	53.5
5.0SMDJ60A-Q	5PGKQ	5.0SMDJ60CA-Q	5BGKQ	66.70	73.70	1	60.0	2	96.8	51.7
5.0SMDJ64A-Q	5PGMQ	5.0SMDJ64CA-Q	5BGMQ	71.10	78.60	1	64.0	2	103.0	48.6
5.0SMDJ70A-Q	5PGPQ	5.0SMDJ70CA-Q	5BGPQ	77.80	86.00	1	70.0	2	113.0	44.3
5.0SMDJ75A-Q	5PGRQ	5.0SMDJ75CA-Q	5BGRQ	83.30	92.10	1	75.0	2	121.0	41.4
5.0SMDJ78A-Q	5PGTQ	5.0SMDJ78CA-Q	5BGTQ	86.70	95.80	1	78.0	2	126.0	39.7
5.0SMDJ85A-Q	5PGVQ	5.0SMDJ85CA-Q	5BGVQ	94.40	104.00	1	85.0	2	137.0	36.5

Continued on next page

Note:

1. 'Q' suffix denotes AEC-Q101 compliance.

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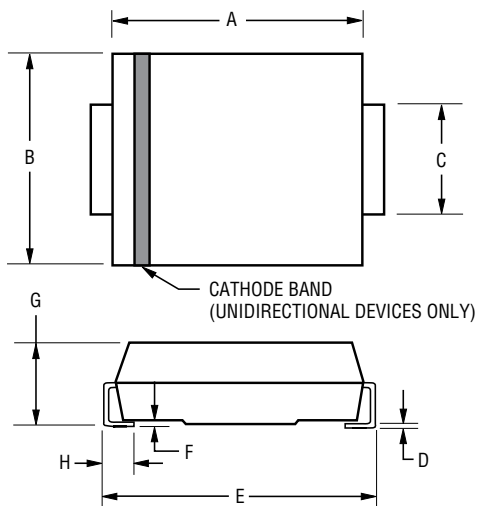
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Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted) - Continued

Unidirectional Device		Bidirectional Device		Breakdown Voltage V_{BR} (Volts)			Reverse Standoff Voltage	Maximum Reverse Leakage @ V_{RWM}	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current
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)
5.0SMDJ90A-Q	5PGXQ			100.00	111.00	1	90.0	2	146.0	34.3
5.0SMDJ100A-Q	5PGZQ			111.00	123.00	1	100.0	2	162.0	30.9
5.0SMDJ110A-Q	5PHEQ			122.00	135.00	1	110.0	2	177.0	28.3
5.0SMDJ120A-Q	5PHGQ			133.00	147.00	1	120.0	2	193.0	26.0
5.0SMDJ130A-Q	5PHKQ			144.00	159.00	1	130.0	2	209.0	24.0
5.0SMDJ150A-Q	5PHMQ			167.00	185.00	1	150.0	2	243.0	20.6
5.0SMDJ160A-Q	5PHPQ			178.00	197.00	1	160.0	2	259.0	19.3
5.0SMDJ170A-Q	5PHRQ			189.00	209.00	1	170.0	2	275.0	18.2

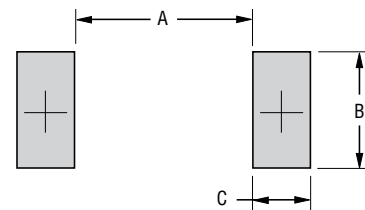
Product Dimensions



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	0.20 (0.008) MAX.
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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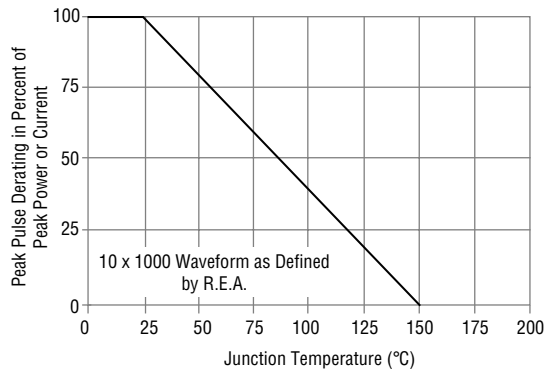
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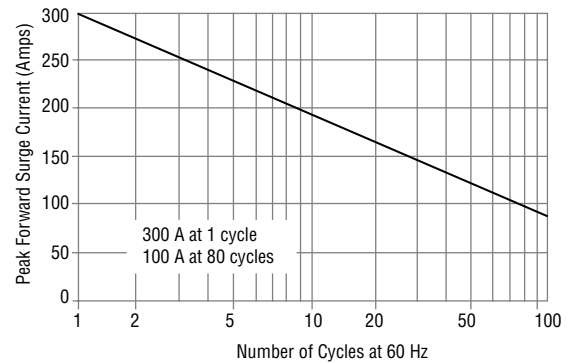
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Rating & Characteristic Curves

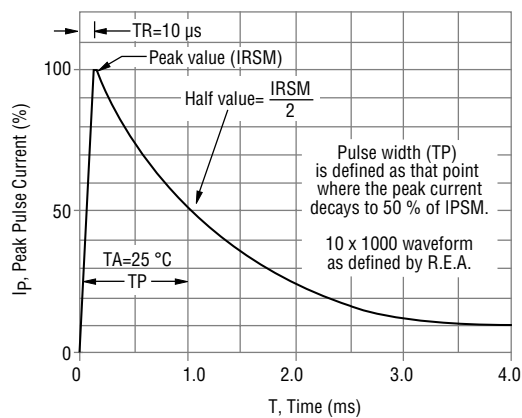
Pulse Derating Curve



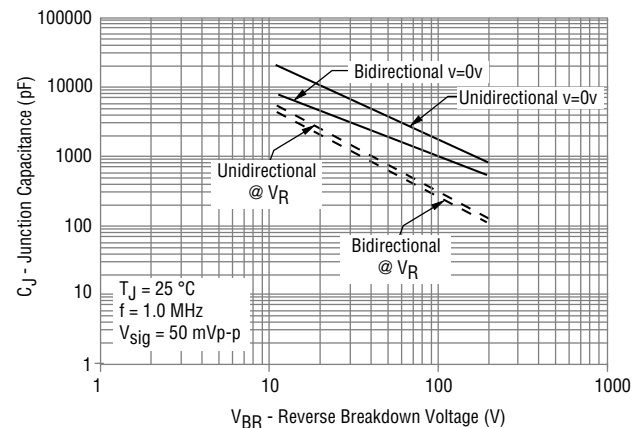
Maximum Non-Repetitive Surge Current



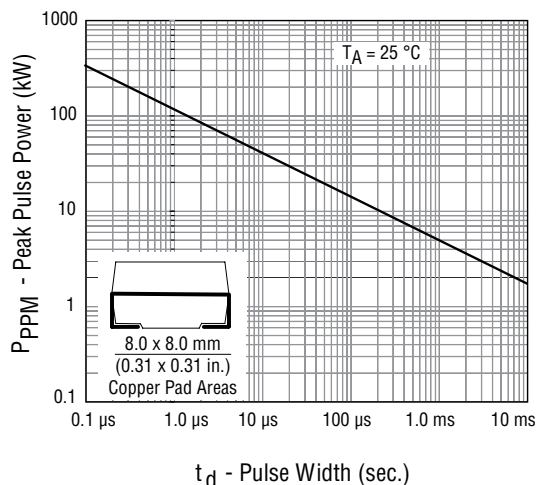
Pulse Waveform



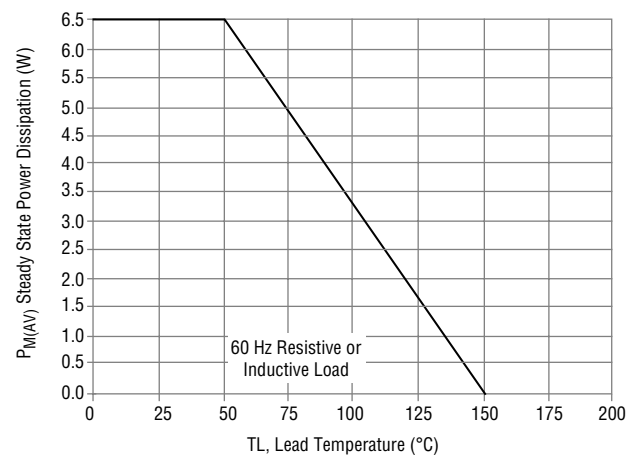
Typical Junction Capacitance



Pulse Rating Curve



Steady State Power Derating Curve



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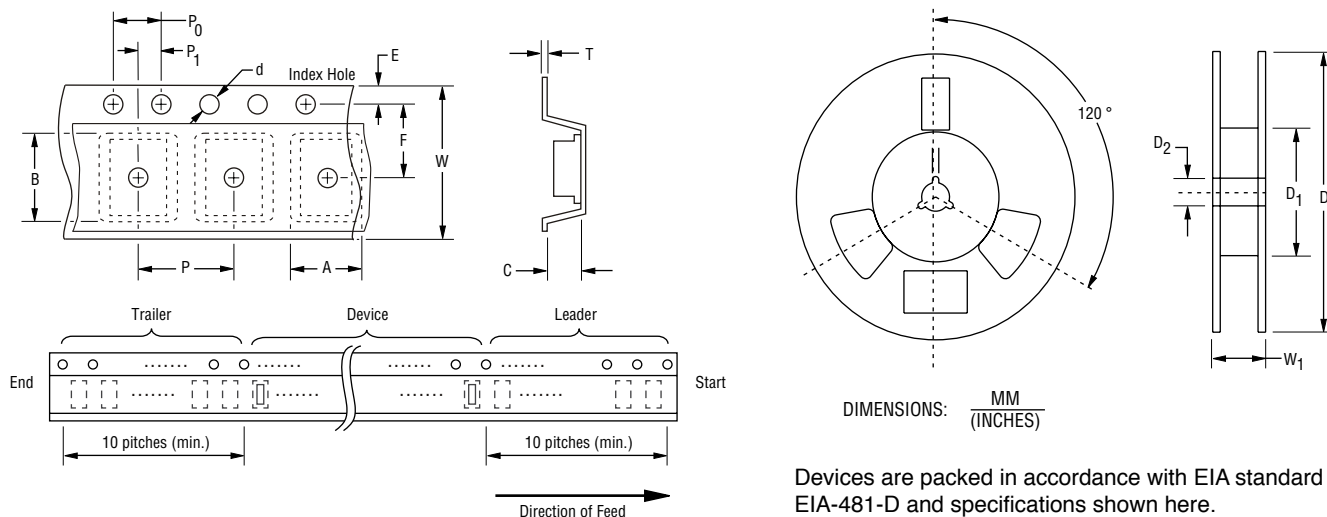
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5.0SMDJ-Q Transient Voltage Suppressor Diode Series

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Packaging Information

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



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

REV. 07/19

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