



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.

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 _{PPM}	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

5.0SMDJ 12 CA - Q

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

AEC-Q101 Compliant Suffix _____
Q = AEC-Q101 Compliant, 3000 pcs. per 13-inch Reel
QH = AEC-Q101 Compliant, 500 pcs. per 7-inch Reel



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.

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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	Max. Reverse Leakage @ V _{RWM}	Max. Clamping Voltage @ I _{pp} (10/1000 μs)	Max. Peak Pulse Current (10/1000 μs)	Max. Clamping Voltage @ I _{pp} (8/20 μs)	Max. 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-Q	5RDEQ	5.0SMDJ5.0CA-Q	5DDEQ	6.40	7.00	10	5.0	1050	9.2	543.6	12.0	2718.0
5.0SMDJ6.0A-Q	5RDGQ	5.0SMDJ6.0CA-Q	5DDGQ	6.67	7.37	10	6.0	1050	10.3	485.5	13.4	2427.5
5.0SMDJ6.5A-Q	5RDKQ	5.0SMDJ6.5CA-Q	5DDKQ	7.22	7.98	10	6.5	750	11.2	446.5	14.6	2232.5
5.0SMDJ7.0A-Q	5PDMQ	5.0SMDJ7.0CA-Q	5DDMQ	7.78	8.60	10	7.0	300	12.0	416.8	15.6	2084.0
5.0SMDJ7.5A-Q	5PDPQ	5.0SMDJ7.5CA-Q	5DDPQ	8.33	9.21	1	7.5	150	12.9	387.7	16.8	1938.5
5.0SMDJ8.0A-Q	5PDRQ	5.0SMDJ8.0CA-Q	5DDRQ	8.89	9.83	1	8.0	70	13.6	367.7	17.7	1838.5
5.0SMDJ8.5A-Q	5PDTQ	5.0SMDJ8.5CA-Q	5DDTQ	9.44	10.40	1	8.5	30	14.4	347.3	18.7	1736.5
5.0SMDJ9.0A-Q	5PDVQ	5.0SMDJ9.0CA-Q	5DDVQ	10.00	11.10	1	9.0	12	15.4	324.8	20.0	1624.0
5.0SMDJ10A-Q	5PDXQ	5.0SMDJ10CA-Q	5DDXQ	11.10	12.30	1	10.0	6	17.0	294.2	22.1	1471.0
5.0SMDJ11A-Q	5PDZQ	5.0SMDJ11CA-Q	5DDZQ	12.20	13.50	1	11.0	2	18.2	274.8	23.7	1374.0
5.0SMDJ12A-Q	5PEPQ	5.0SMDJ12CA-Q	5BEPQ	13.30	14.70	1	12.0	2	19.9	252.0	25.9	1260.0
5.0SMDJ13A-Q	5PEQQ	5.0SMDJ13CA-Q	5BEQQ	14.40	15.90	1	13.0	2	21.5	233.0	28.0	1165.0
5.0SMDJ14A-Q	5PERQ	5.0SMDJ14CA-Q	5BERQ	15.60	17.20	1	14.0	2	23.2	216.0	30.2	1080.0
5.0SMDJ15A-Q	5PESQ	5.0SMDJ15CA-Q	5BESQ	16.70	18.50	1	15.0	2	24.4	205.0	31.7	1025.0
5.0SMDJ16A-Q	5PETQ	5.0SMDJ16CA-Q	5BETQ	17.80	19.70	1	16.0	2	26.0	193.0	33.8	965.0
5.0SMDJ17A-Q	5PEUQ	5.0SMDJ17CA-Q	5BEUQ	18.90	20.90	1	17.0	2	27.6	181.0	35.9	905.0
5.0SMDJ18A-Q	5PEVQ	5.0SMDJ18CA-Q	5BEVQ	20.00	22.10	1	18.0	2	29.2	172.0	38.0	860.0
5.0SMDJ20A-Q	5PEWQ	5.0SMDJ20CA-Q	5BEWQ	22.20	24.50	1	20.0	2	32.4	155.0	42.1	775.0
5.0SMDJ22A-Q	5PEXQ	5.0SMDJ22CA-Q	5BEXQ	24.40	26.90	1	22.0	2	35.5	141.0	46.2	705.0
5.0SMDJ24A-Q	5PEZQ	5.0SMDJ24CA-Q	5BEZQ	26.70	29.50	1	24.0	2	38.9	129.0	50.6	645.0
5.0SMDJ26A-Q	5PFEQ	5.0SMDJ26CA-Q	5BFEQ	28.90	31.90	1	26.0	2	42.1	119.0	54.7	595.0
5.0SMDJ28A-Q	5PFGQ	5.0SMDJ28CA-Q	5BFGQ	31.10	34.40	1	28.0	2	45.4	110.0	59.0	550.0
5.0SMDJ30A-Q	5PFQ	5.0SMDJ30CA-Q	5BFQ	33.30	36.80	1	30.0	2	48.4	103.0	62.9	515.0
5.0SMDJ33A-Q	5PFMQ	5.0SMDJ33CA-Q	5BFMQ	36.70	40.60	1	33.0	2	53.3	93.9	69.3	469.5
5.0SMDJ36A-Q	5PFPQ	5.0SMDJ36CA-Q	5BFQ	40.00	44.20	1	36.0	2	58.1	86.1	75.5	430.5
5.0SMDJ40A-Q	5PFRQ	5.0SMDJ40CA-Q	5BFRQ	44.40	49.10	1	40.0	2	64.5	77.6	83.9	388.0
5.0SMDJ43A-Q	5PFTQ	5.0SMDJ43CA-Q	5BFTQ	47.80	52.80	1	43.0	2	69.4	72.1	90.2	360.5
5.0SMDJ45A-Q	5PFVQ	5.0SMDJ45CA-Q	5BFVQ	50.00	55.30	1	45.0	2	72.7	68.8	94.5	344.0
5.0SMDJ48A-Q	5PFXQ	5.0SMDJ48CA-Q	5BFQ	53.30	58.90	1	48.0	2	77.4	64.7	100.6	323.5
5.0SMDJ51A-Q	5PFZQ	5.0SMDJ51CA-Q	5BFZQ	56.70	62.70	1	51.0	2	82.4	60.7	107.1	303.5
5.0SMDJ54A-Q	5RGEQ	5.0SMDJ54CA-Q	5BGEQ	60.00	66.30	1	54.0	2	87.1	57.5	113.2	287.5
5.0SMDJ58A-Q	5PGGQ	5.0SMDJ58CA-Q	5BGGQ	64.40	71.20	1	58.0	2	93.6	53.5	121.7	267.5
5.0SMDJ60A-Q	5PGKQ	5.0SMDJ60CA-Q	5BGKQ	66.70	73.70	1	60.0	2	96.8	51.7	125.8	258.5
5.0SMDJ64A-Q	5PGMQ	5.0SMDJ64CA-Q	5BGMQ	71.10	78.60	1	64.0	2	103.0	48.6	133.9	243.0
5.0SMDJ70A-Q	5PGPQ	5.0SMDJ70CA-Q	5BGPQ	77.80	86.00	1	70.0	2	113.0	44.3	146.9	221.5
5.0SMDJ75A-Q	5PGRQ	5.0SMDJ75CA-Q	5BGRQ	83.30	92.10	1	75.0	2	121.0	41.4	157.3	207.0
5.0SMDJ78A-Q	5PGTQ	5.0SMDJ78CA-Q	5BGTQ	86.70	95.80	1	78.0	2	126.0	39.7	163.8	198.5
5.0SMDJ85A-Q	5PGVQ	5.0SMDJ85CA-Q	5BGVQ	94.40	104.00	1	85.0	2	137.0	36.5	178.1	182.5

Continued on next page

Note:

- 'Q' suffix denotes AEC-Q101 compliance.
- For bidirectional devices with a V_R of 10 volts or less, the I_R limit is double.

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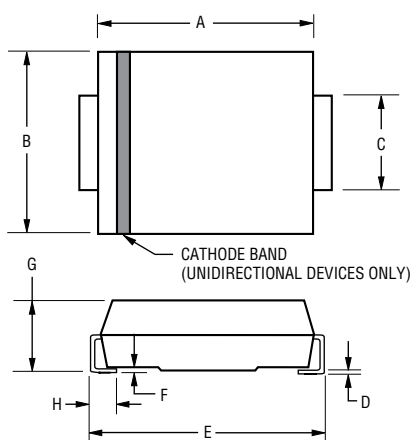
5.0SMDJ-Q Transient Voltage Suppressor Diode Series

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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}	Max. Clamping Voltage @ I_{pp} (10/1000 μs)	Max. Peak Pulse Current (10/1000 μs)	Max. Clamping Voltage @ I_{pp} (8/20 μs)	Max. 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)
5.0SMDJ90A-Q	5PGXQ			100.00	111.00	1	90.0	2	146.0	34.3	189.8	171.5
5.0SMDJ100A-Q	5PGZQ			111.00	123.00	1	100.0	2	162.0	30.9	210.6	154.5
5.0SMDJ110A-Q	5PHEQ			122.00	135.00	1	110.0	2	177.0	28.3	230.1	141.5
5.0SMDJ120A-Q	5PHGQ			133.00	147.00	1	120.0	2	193.0	26.0	250.9	130.0
5.0SMDJ130A-Q	5PHKQ			144.00	159.00	1	130.0	2	209.0	24.0	271.7	120.0
5.0SMDJ150A-Q	5PHMQ			167.00	185.00	1	150.0	2	243.0	20.6	315.9	103.0
5.0SMDJ160A-Q	5PHPQ			178.00	197.00	1	160.0	2	259.0	19.3	336.7	96.5
5.0SMDJ170A-Q	5PHRQ			189.00	209.00	1	170.0	2	275.0	18.2	357.5	91.0

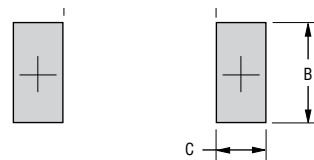
Product Dimensions



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	$\frac{2.90 - 3.20}{(0.114 - 0.126)}$
D	$\frac{0.15 - 0.31}{(0.006 - 0.012)}$
E	$\frac{7.75 - 8.13}{(0.305 - 0.320)}$
F	$\frac{0.20}{(0.008)} \text{ MAX.}$
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.)	$\frac{1.53}{(0.060)}$

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

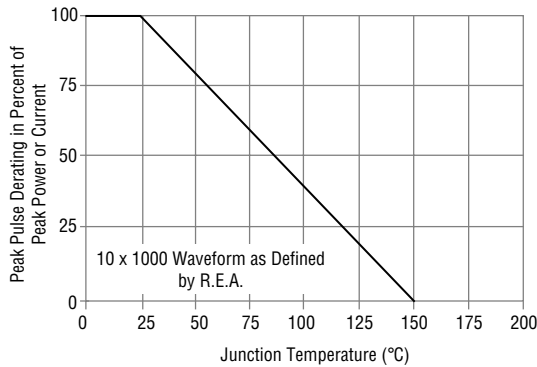
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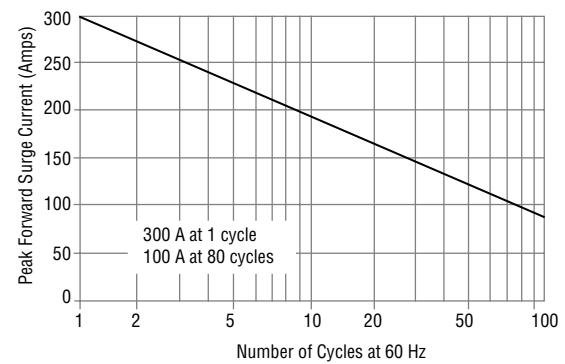
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Rating & Characteristic Curves

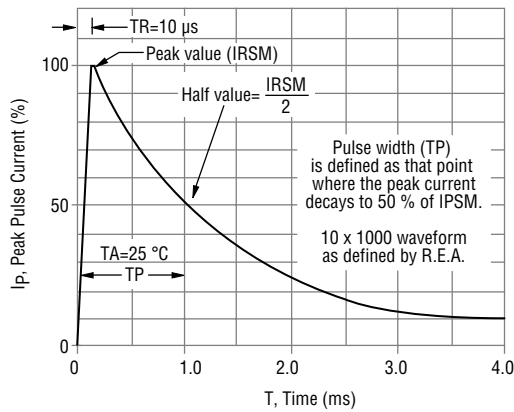
Pulse Derating Curve



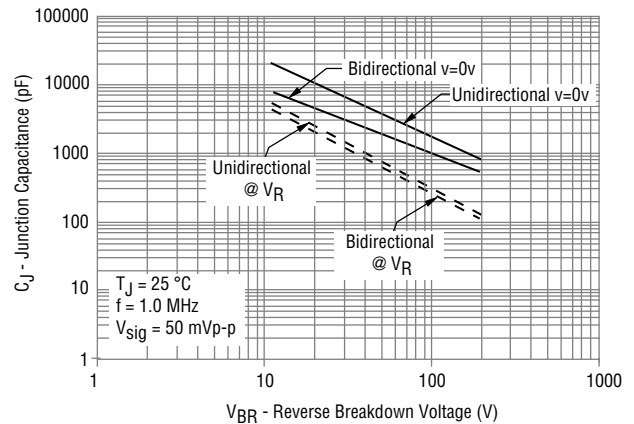
Maximum Non-Repetitive Surge Current



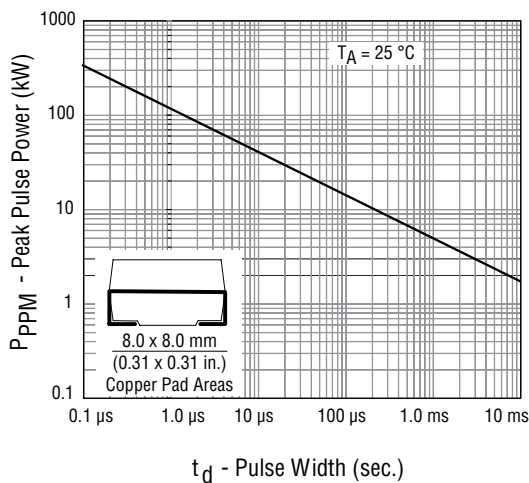
Pulse Waveform



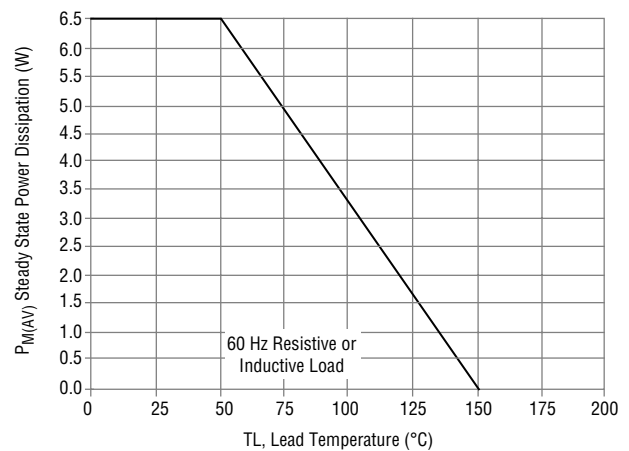
Typical Junction Capacitance



Pulse Rating Curve



Steady State Power Derating Curve



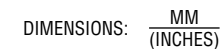
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The product will be dispensed in tape and reel format (see diagram below).



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	$\frac{50.0}{(1.969)}$ 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	$\frac{22.4}{(0.882)}$ MAX.	
Quantity per Reel	--	500	3,000

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