



**THE DATASHEET OF  
SMBJ13A-Q**





## Features

- Surface Mount SMB package
- Standoff Voltage: 5 to 220 volts
- Power Dissipation: 600 watts
- RoHS compliant\*
- AEC-Q101 compliant\*\*

## Applications

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

# SMBJ-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-214AA (SMB) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 5 V up to 220 V. Typical fast response times are less than 1.0 picosecond 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:



[PRODUCT SELECTOR](#) [TECHNICAL LIBRARY](#) [INVENTORY](#) [SAMPLES](#) [CONTACT](#)

### Agency Recognition

Description	
UL	File Number: <a href="#">E153537</a>

### 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>	600	Watts
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3)	I <sub>FSM</sub>	100	Amps
Operating Temperature Range	T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T<sub>A</sub> = 25 °C per Pulse Derating Curve.
2. Mounted on 5.0 mm<sup>2</sup> (0.03 mm thick) copper pads to each terminal.
3. 8.3 ms Single Half-Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).

# BOURNS®

Asia-Pacific: Tel: +886-2 2562-4117 • Email: [asiacus@bourns.com](mailto:asiacus@bourns.com)

EMEA: Tel: +36 88 885 877 • Email: [eurocus@bourns.com](mailto:eurocus@bourns.com)

The Americas: Tel: +1-951 781-5500 • Email: [americus@bourns.com](mailto:americus@bourns.com)

[www.bourns.com](http://www.bourns.com)



**WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

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

\*\*Q" part number suffix indicates AEC-Q101 compliance.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

# SMBJ-Q Transient Voltage Suppressor Diode Series

## 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 Clamping Voltage @ I <sub>pp</sub> (10/1000 μs)	Maximum Peak Pulse Current (10/1000 μs)	Maximum Clamping Voltage @ I <sub>pp</sub> (8/20 μs)	Maximum Peak Pulse Current (8/20 μs)
Part No.	Marking	Part No.	Marking	Min.	Max.	@ I <sub>T</sub> (mA)	V <sub>RWM</sub> (V)	I <sub>R</sub> (μA)	V <sub>c</sub> (V)	I <sub>pp</sub> (A)	V <sub>c</sub> (V)	I <sub>pp</sub> (A)
SMBJ5.0A-Q	KEQ	SMBJ5.0CA-Q	AEQ	6.40	7.00	10	5.0	800	9.2	65.3	12.0	326.5
SMBJ6.0A-Q	KGQ	SMBJ6.0CA-Q	AGQ	6.67	7.37	10	6.0	800	10.3	58.3	13.4	291.5
SMBJ6.5A-Q	KKQ	SMBJ6.5CA-Q	AKQ	7.22	7.98	10	6.5	500	11.2	53.6	14.6	268.0
SMBJ7.0A-Q	KMQ	SMBJ7.0CA-Q	AMQ	7.78	8.60	10	7.0	200	12.0	50.0	15.6	250.0
SMBJ7.5A-Q	KPQ	SMBJ7.5CA-Q	APQ	8.33	9.21	1.0	7.5	100	12.9	46.6	16.8	233.0
SMBJ8.0A-Q	KRQ	SMBJ8.0CA-Q	ARQ	8.89	9.83	1.0	8.0	50	13.6	44.2	17.7	221.0
SMBJ8.5A-Q	KTQ	SMBJ8.5CA-Q	ATQ	9.44	10.4	1.0	8.5	20	14.4	41.7	18.7	208.5
SMBJ9.0A-Q	KVQ	SMBJ9.0CA-Q	AVQ	10.0	11.1	1.0	9.0	10	15.4	39.0	20.0	195.0
SMBJ10A-Q	KXQ	SMBJ10CA-Q	AXQ	11.1	12.3	1.0	10	5.0	17.0	35.3	22.1	176.5
SMBJ11A-Q	KZQ	SMBJ11CA-Q	AZQ	12.2	13.5	1.0	11	1.0	18.2	33.0	23.7	165.0
SMBJ12A-Q	LEQ	SMBJ12CA-Q	BEQ	13.3	14.7	1.0	12	1.0	19.9	30.2	25.9	151.0
SMBJ13A-Q	LGQ	SMBJ13CA-Q	BGQ	14.4	15.9	1.0	13	1.0	21.5	28.0	28.0	140.0
SMBJ14A-Q	LKQ	SMBJ14CA-Q	BKQ	15.6	17.2	1.0	14	1.0	23.2	25.9	30.2	129.5
SMBJ15A-Q	LMQ	SMBJ15CA-Q	BMQ	16.7	18.5	1.0	15	1.0	24.4	24.6	31.7	123.0
SMBJ16A-Q	LPQ	SMBJ16CA-Q	BPQ	17.8	19.7	1.0	16	1.0	26.0	23.1	33.8	115.5
SMBJ17A-Q	LRQ	SMBJ17CA-Q	BRQ	18.9	20.9	1.0	17	1.0	27.6	21.8	35.9	109.0
SMBJ18A-Q	LTQ	SMBJ18CA-Q	BTQ	20.0	22.1	1.0	18	1.0	29.2	20.6	38.0	103.0
SMBJ20A-Q	LVQ	SMBJ20CA-Q	BVQ	22.2	24.5	1.0	20	1.0	32.4	18.6	42.1	93.0
SMBJ22A-Q	LXQ	SMBJ22CA-Q	BXQ	24.4	26.9	1.0	22	1.0	35.5	16.9	46.2	84.5
SMBJ24A-Q	LZQ	SMBJ24CA-Q	BZQ	26.7	29.5	1.0	24	1.0	38.9	15.5	50.6	77.5
SMBJ26A-Q	MEQ	SMBJ26CA-Q	CEQ	28.9	31.9	1.0	26	1.0	42.1	14.3	54.7	71.5
SMBJ28A-Q	MGQ	SMBJ28CA-Q	CGQ	31.1	34.4	1.0	28	1.0	45.4	13.3	59.0	66.5
SMBJ30A-Q	MKQ	SMBJ30CA-Q	CKQ	33.3	36.8	1.0	30	1.0	48.4	12.4	62.9	62.0
SMBJ33A-Q	MMQ	SMBJ33CA-Q	CMQ	36.7	40.6	1.0	33	1.0	53.3	11.3	69.3	56.5
SMBJ36A-Q	MPQ	SMBJ36CA-Q	CPQ	40	44.2	1.0	36	1.0	58.1	10.4	75.5	52.0
SMBJ40A-Q	MRQ	SMBJ40CA-Q	CRQ	44.4	49.1	1.0	40	1.0	64.5	9.3	83.9	46.5
SMBJ43A-Q	MTQ	SMBJ43CA-Q	CTQ	47.8	52.8	1.0	43	1.0	69.4	8.7	90.2	43.5
SMBJ45A-Q	MVQ	SMBJ45CA-Q	CVQ	50	55.3	1.0	45	1.0	72.7	8.3	94.5	41.5
SMBJ48A-Q	MXQ	SMBJ48CA-Q	CXQ	53.3	58.9	1.0	48	1.0	77.4	7.8	100.6	39.0
SMBJ51A-Q	MZQ	SMBJ51CA-Q	CZQ	56.7	62.7	1.0	51	1.0	82.4	7.3	107.1	36.5
SMBJ54A-Q	NEQ	SMBJ54CA-Q	DEQ	60	66.3	1.0	54	1.0	87.1	6.9	113.2	34.5
SMBJ58A-Q	NGQ	SMBJ58CA-Q	DGQ	64.4	71.2	1.0	58	1.0	93.6	6.5	121.7	32.5
SMBJ60A-Q	NKQ	SMBJ60CA-Q	DKQ	66.7	73.7	1.0	60	1.0	96.8	6.2	125.8	31.0
SMBJ64A-Q	NMQ	SMBJ64CA-Q	DMQ	71.1	78.6	1.0	64	1.0	103	5.9	133.9	29.5
SMBJ70A-Q	NPQ	SMBJ70CA-Q	DPQ	77.8	86.0	1.0	70	1.0	113	5.3	146.9	26.5
SMBJ75A-Q	NRQ	SMBJ75CA-Q	DRQ	83.3	92.1	1.0	75	1.0	121	5.0	157.3	25.0
SMBJ78A-Q	NTQ	SMBJ78CA-Q	DTQ	86.7	95.8	1.0	78	1.0	126	4.8	163.8	24.0
SMBJ85A-Q	NVQ	SMBJ85CA-Q	DVQ	94.4	104	1.0	85	1.0	137	4.4	178.1	22.0
SMBJ90A-Q	NXQ	SMBJ90CA-Q	DXQ	100	111	1.0	90	1.0	146	4.1	189.8	20.5
SMBJ100A-Q	NZQ	SMBJ100CA-Q	DZQ	111	123	1.0	100	1.0	162	3.7	210.6	18.5
SMBJ110A-Q	PEQ	SMBJ110CA-Q	EEQ	122	135	1.0	110	1.0	177	3.4	230.1	17.0
SMBJ120A-Q	PGQ	SMBJ120CA-Q	EGQ	133	147	1.0	120	1.0	193	3.1	250.9	15.5
SMBJ130A-Q	PKQ	SMBJ130CA-Q	EKQ	144	159	1.0	130	1.0	209	2.9	271.7	14.5
SMBJ150A-Q	PMQ	SMBJ150CA-Q	EMQ	167	185	1.0	150	1.0	243	2.5	315.9	12.5
SMBJ160A-Q	PPQ	SMBJ160CA-Q	EPQ	178	197	1.0	160	1.0	259	2.3	336.7	11.5
SMBJ170A-Q	PRQ	SMBJ170CA-Q	ERQ	189	209	1.0	170	1.0	275	2.2	357.5	11.0
SMBJ180A-Q	PTQ	SMBJ180CA-Q	ETQ	201	222	1.0	180	1.0	292	2.1	379.6	10.5
SMBJ200A-Q	PVQ	SMBJ200CA-Q	EVQ	224	247	1.0	200	1.0	324	1.9	421.2	9.5
SMBJ220A-Q	PXQ	SMBJ220CA-Q	EXQ	246	272	1.0	220	1.0	356	1.7	462.8	8.5

Notes: 1. Suffix 'A' denotes a 5 % tolerance unidirectional device.  
 2. Suffix 'CA' denotes a 5 % tolerance bidirectional device.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

# SMBJ-Q Transient Voltage Suppressor Diode Series

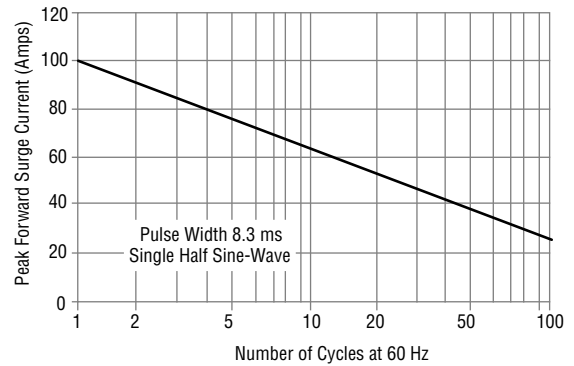


## Performance Graphs

### Peak Pulse Power Derating Curve



### Maximum Non-Repetitive Surge Current



### Pulse Waveform



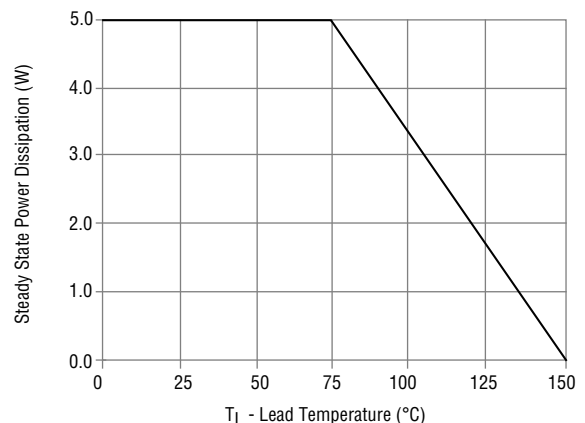
### Typical Junction Capacitance



### Pulse Rating Curve



### Steady State Power Derating Curve



Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

# SMBJ-Q Transient Voltage Suppressor Diode Series



## Product Dimensions



Dimension	SMB (DO-214AA)
A	4.06 - 4.57 (0.160 - 0.180)
B	3.30 - 3.94 (0.130 - 0.155)
C	1.95 - 2.20 (0.077 - 0.087)
D	0.15 - 0.31 (0.006 - 0.012)
E	5.21 - 5.59 (0.205 - 0.220)
F	0.203 MAX. (0.008)
G	2.13 - 2.44 (0.084 - 0.096)
H	0.76 - 1.52 (0.030 - 0.060)

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

## Typical Part Marking



## Recommended Footprint



Dimension	SMB (DO-214AA)
A (Max.)	2.69 (0.106)
B (Min.)	2.10 (0.083)
C (Min.)	1.27 (0.050)

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

## How to Order

Package **SMBJ 12 CA - Q**  
SMBJ = SMB/DO-214AA  
Working Peak Reverse Voltage .....  
5 ~ 220 = 5 ~ 220 V<sub>RWM</sub> (Volts)  
Suffix .....  
A = 5 % Tolerance Unidirectional Device  
CA = 5 % Tolerance Bidirectional Device  
AEC-Q101 Suffix .....  
Q = AEC-Q101 Compliant, 13-inch Reel  
QH = AEC-Q101 Compliant, 7-inch Reel

## Environmental Specifications

Moisture Sensitivity Level..... 1  
ESD Classification (HBM).....3B

# SMBJ-Q Transient Voltage Suppressor Diode Series

# BOURNS®

## Packaging Information

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



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

Item	Symbol	SMB (DO-214AA)	
		7-Inch Reel	13-Inch Reel
Carrier Width	A	$\frac{3.67 \pm 0.20}{(0.144 \pm 0.008)}$	
Carrier Length	B	$\frac{5.60 \pm 0.20}{(0.220 \pm 0.008)}$	
Carrier Depth	C	$\frac{2.57 \pm 0.20}{(0.101 \pm 0.008)}$	
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 <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	$\frac{5.50 \pm 0.05}{(0.217 \pm 0.002)}$	
Punch Hole Pitch	P	$\frac{8.00 \pm 0.10}{(0.315 \pm 0.004)}$	
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	$\frac{12.00 \pm 0.30}{(0.472 \pm 0.012)}$	
Reel Width	W <sub>1</sub>	$\frac{18.4}{(0.724)}$ MAX.	
Quantity per Reel	--	500	3,000

REV. 10/20

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

This legal disclaimer applies to purchasers and users of Bourns® products manufactured by or on behalf of Bourns, Inc. and its affiliates (collectively, “Bourns”).

Unless otherwise expressly indicated in writing, Bourns® products and data sheets relating thereto are subject to change without notice. Users should check for and obtain the latest relevant information and verify that such information is current and complete before placing orders for Bourns® products.

The characteristics and parameters of a Bourns® product set forth in its data sheet are based on laboratory conditions, and statements regarding the suitability of products for certain types of applications are based on Bourns’ knowledge of typical requirements in generic applications. The characteristics and parameters of a Bourns® product in a user application may vary from the data sheet characteristics and parameters due to (i) the combination of the Bourns® product with other components in the user’s application, or (ii) the environment of the user application itself. The characteristics and parameters of a Bourns® product also can and do vary in different applications and actual performance may vary over time. Users should always verify the actual performance of the Bourns® product in their specific devices and applications, and make their own independent judgments regarding the amount of additional test margin to design into their device or application to compensate for differences between laboratory and real world conditions.

Unless Bourns has explicitly designated an individual Bourns® product as meeting the requirements of a particular industry standard (e.g., ISO/TS 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. 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 nuclear, lifesaving, life-critical or life-sustaining applications, nor in any other applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage. Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any Bourns® products in such unauthorized applications might not be safe and thus is at the user’s sole risk. Life-critical applications include devices identified by the U.S. Food and Drug Administration as Class III devices and generally equivalent classifications outside of the United States.

Bourns expressly identifies those Bourns® standard products that are suitable for use in automotive applications on such products’ data sheets in the section entitled “Applications.” Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard products in an automotive application might not be safe and thus is not recommended, authorized or intended and is at the user’s sole risk. If Bourns expressly identifies a sub-category of automotive application in the data sheet for its standard products (such as infotainment or lighting), such identification means that Bourns has reviewed its standard product and has determined that if such Bourns® standard product is considered for potential use in automotive applications, it should only be used in such sub-category of automotive applications. Any reference to Bourns® standard product in the data sheet as compliant with the AEC-Q standard or “automotive grade” does not by itself mean that Bourns has approved such product for use in an automotive application.

Bourns® standard products are not tested to comply with United States Federal Aviation Administration standards generally or any other generally equivalent governmental organization standard applicable to products designed or manufactured for use in aircraft or space applications. Bourns expressly identifies Bourns® standard products that are suitable for use in aircraft or space applications on such products’ data sheets in the section entitled “Applications.” Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard product in an aircraft or space application might not be safe and thus is not recommended, authorized or intended and is at the user’s sole risk.

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.

Users shall not sell, transfer, export or re-export any Bourns® products or technology for use in activities which involve the design, development, production, use or stockpiling of nuclear, chemical or biological weapons or missiles, nor shall they use Bourns® products or technology in any facility which engages in activities relating to such devices. The foregoing restrictions apply to all uses and applications that violate national or international prohibitions, including embargos or international regulations. Further, Bourns® products and Bourns technology and technical data may not under any circumstance be exported or re-exported to countries subject to international sanctions or embargoes. Bourns® products may not, without prior authorization from Bourns and/or the U.S. Government, be resold, transferred, or re-exported to any party not eligible to receive U.S. commodities, software, and technical data.

To the maximum extent permitted by applicable law, Bourns disclaims (i) any and all liability for special, punitive, consequential, incidental or indirect damages or lost revenues or lost profits, and (ii) any and all implied warranties, including implied warranties of fitness for particular purpose, non-infringement and merchantability.

*For your convenience, copies of this Legal Disclaimer Notice with German, Spanish, Japanese, Traditional Chinese and Simplified Chinese bilingual versions are available at:*

*Web Page:* <http://www.bourns.com/legal/disclaimers-terms-and-policies>

*PDF:* <http://www.bourns.com/docs/Legal/disclaimer.pdf>



## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

 [View SMBJ13A-Q on WIN SOURCE](#)

 [Bourns Inc. Information](#)

## Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management