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Features

- RoHS compliant*
- Surface Mount SMB package
- Standoff Voltage: 5 to 495 volts
- Power Dissipation: 600 watts

Applications

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

SMBJ 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-214AA (SMB) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 5 V up to 495 V and Breakdown Voltage up to 550 V. Typical fast response times are less than 1.0 picosecond for unidirectional devices and less than 5.0 picoseconds 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.

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}	600	Watts
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3)		I_{FSM}	100	Amps
Steady State Power Dissipation @ TL = 75 °C		$P_{M(AV)}$	5.0	Watts
Maximum Instantaneous Forward Voltage @ I_{PP} = 50 A (For Unidirectional Units Only)	SMBJ5.0A ~ SMBJ90A SMBJ100A ~ SMBJ495A	V_F	3.5 5.0	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 Half-Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).

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How to Order

SMBJ 5.0 CA - H

Package
SMBJ = SMB/DO-214AA

Working Peak Reverse Voltage
5.0 = 5.0 V_{RWM} (Volts)

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

Reel
(blank) = 13 inch reel
-H = 7 inch reel

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

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
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SMBJ 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)			Working Peak Reverse 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 No.	Marking	Part No.	Marking	Min.	Max.	@ I_T (mA)	V_{RWM} (V)	I_R (μA)	V_C (V)	I_{pp} (A)	V_C (V)	I_{pp} (A)
SMBJ5.0A	KE	SMBJ5.0CA	AE	6.40	7.00	10	5.0	800	9.2	65.3	12.0	326.5
SMBJ6.0A	KG	SMBJ6.0CA	AG	6.67	7.37	10	6.0	800	10.3	58.3	13.4	291.5
SMBJ6.5A	KK	SMBJ6.5CA	AK	7.22	7.98	10	6.5	500	11.2	53.6	14.6	268.0
SMBJ7.0A	KM	SMBJ7.0CA	AM	7.78	8.60	10	7.0	200	12.0	50.0	15.6	250.0
SMBJ7.5A	KP	SMBJ7.5CA	AP	8.33	9.21	1.0	7.5	100	12.9	46.6	16.8	233.0
SMBJ8.0A	KR	SMBJ8.0CA	AR	8.89	9.83	1.0	8.0	50	13.6	44.2	17.7	221.0
SMBJ8.5A	KT	SMBJ8.5CA	AT	9.44	10.4	1.0	8.5	20	14.4	41.7	18.7	208.5
SMBJ9.0A	KV	SMBJ9.0CA	AV	10.0	11.1	1.0	9.0	10	15.4	39.0	20.0	195.0
SMBJ10A	KX	SMBJ10CA	AX	11.1	12.3	1.0	10	5.0	17.0	35.3	22.1	176.5
SMBJ11A	KZ	SMBJ11CA	AZ	12.2	13.5	1.0	11	1.0	18.2	33.0	23.7	165.0
SMBJ12A	LE	SMBJ12CA	BE	13.3	14.7	1.0	12	1.0	19.9	30.2	25.9	151.0
SMBJ13A	LG	SMBJ13CA	BG	14.4	15.9	1.0	13	1.0	21.5	28.0	28.0	140.0
SMBJ14A	LK	SMBJ14CA	BK	15.6	17.2	1.0	14	1.0	23.2	25.9	30.2	129.5
SMBJ15A	LM	SMBJ15CA	BM	16.7	18.5	1.0	15	1.0	24.4	24.6	31.7	123.0
SMBJ16A	LP	SMBJ16CA	BP	17.8	19.7	1.0	16	1.0	26.0	23.1	33.8	115.5
SMBJ17A	LR	SMBJ17CA	BR	18.9	20.9	1.0	17	1.0	27.6	21.8	35.9	109.0
SMBJ18A	LT	SMBJ18CA	BT	20.0	22.1	1.0	18	1.0	29.2	20.6	38.0	103.0
SMBJ20A	LV	SMBJ20CA	BV	22.2	24.5	1.0	20	1.0	32.4	18.6	42.1	93.0
SMBJ22A	LX	SMBJ22CA	BX	24.4	26.9	1.0	22	1.0	35.5	16.9	46.2	84.5
SMBJ24A	LZ	SMBJ24CA	BZ	26.7	29.5	1.0	24	1.0	38.9	15.5	50.6	77.5
SMBJ26A	ME	SMBJ26CA	CE	28.9	31.9	1.0	26	1.0	42.1	14.3	54.7	71.5
SMBJ28A	MG	SMBJ28CA	CG	31.1	34.4	1.0	28	1.0	45.4	13.3	59.0	66.5
SMBJ30A	MK	SMBJ30CA	CK	33.3	36.8	1.0	30	1.0	48.4	12.4	62.9	62.0
SMBJ33A	MM	SMBJ33CA	CM	36.7	40.6	1.0	33	1.0	53.3	11.3	69.3	56.5
SMBJ36A	MP	SMBJ36CA	CP	40	44.2	1.0	36	1.0	58.1	10.4	75.5	52.0
SMBJ40A	MR	SMBJ40CA	CR	44.4	49.1	1.0	40	1.0	64.5	9.3	83.9	46.5
SMBJ43A	MT	SMBJ43CA	CT	47.8	52.8	1.0	43	1.0	69.4	8.7	90.2	43.5
SMBJ45A	MV	SMBJ45CA	CV	50	55.3	1.0	45	1.0	72.7	8.3	94.5	41.5
SMBJ48A	MX	SMBJ48CA	CX	53.3	58.9	1.0	48	1.0	77.4	7.8	100.6	39.0
SMBJ51A	MZ	SMBJ51CA	CZ	56.7	62.7	1.0	51	1.0	82.4	7.3	107.1	36.5
SMBJ54A	NE	SMBJ54CA	DE	60	66.3	1.0	54	1.0	87.1	6.9	113.2	34.5
SMBJ58A	NG	SMBJ58CA	DG	64.4	71.2	1.0	58	1.0	93.6	6.5	121.7	32.5
SMBJ60A	NK	SMBJ60CA	DK	66.7	73.7	1.0	60	1.0	96.8	6.2	125.8	31.0
SMBJ64A	NM	SMBJ64CA	DM	71.1	78.6	1.0	64	1.0	103	5.9	133.9	29.5
SMBJ70A	NP	SMBJ70CA	DP	77.8	86.0	1.0	70	1.0	113	5.3	146.9	26.5
SMBJ75A	NR	SMBJ75CA	DR	83.3	92.1	1.0	75	1.0	121	5.0	157.3	25.0
SMBJ78A	NT	SMBJ78CA	DT	86.7	95.8	1.0	78	1.0	126	4.8	163.8	24.0
SMBJ85A	NV	SMBJ85CA	DV	94.4	104	1.0	85	1.0	137	4.4	178.1	22.0
SMBJ90A	NX	SMBJ90CA	DX	100	111	1.0	90	1.0	146	4.1	189.8	20.5
SMBJ100A	NZ	SMBJ100CA	DZ	111	123	1.0	100	1.0	162	3.7	210.6	18.5
SMBJ110A	PE	SMBJ110CA	EE	122	135	1.0	110	1.0	177	3.4	230.1	17.0
SMBJ120A	PG	SMBJ120CA	EG	133	147	1.0	120	1.0	193	3.1	250.9	15.5
SMBJ130A	PK	SMBJ130CA	EK	144	159	1.0	130	1.0	209	2.9	271.7	14.5
SMBJ150A	PM	SMBJ150CA	EM	167	185	1.0	150	1.0	243	2.5	315.9	12.5
SMBJ160A	PP	SMBJ160CA	EP	178	197	1.0	160	1.0	259	2.3	336.7	11.5
SMBJ170A	PR	SMBJ170CA	ER	189	209	1.0	170	1.0	275	2.2	357.5	11.0
SMBJ180A	PT	SMBJ180CA	ET	201	222	1.0	180	1.0	292	2.1	379.6	10.5
SMBJ200A	PV	SMBJ200CA	EV	224	247	1.0	200	1.0	324	1.9	421.2	9.5
SMBJ220A	PX	SMBJ220CA	EX	246	272	1.0	220	1.0	356	1.7	462.8	8.5
SMBJ250A	PZ	SMBJ250CA	EZ	279	309	1.0	250	1.0	405	1.5	526.5	7.5
SMBJ300A	QE	SMBJ300CA	WE	335	371	1.0	300	1.0	486	1.3	631.8	6.5
SMBJ350A	QG	SMBJ350CA	WG	391	432	1.0	350	1.0	567	1.1	737.1	5.5
SMBJ376A	376A	SMBJ376CA	376C	418	462	1.0	376	1.0	602	1.0	782.6	5.0
SMBJ400A	QK	SMBJ400CA	WK	447	494	1.0	400	1.0	648	0.9	842.4	4.5
SMBJ408A	408A	SMBJ408CA	408C	456	504	1.0	408	1.0	658	0.9	855.4	4.6
SMBJ440A	QM	SMBJ440CA	WM	492	543	1.0	440	1.0	713	0.9	926.9	4.5
SMBJ495A	495A	SMBJ495CA	495C	522	578	1.0	495	1.0	760	0.8	988.0	3.9

Notes:
1. Suffix 'A' denotes a 5 % tolerance unidirectional device.
2. Suffix 'CA' denotes a 5 % tolerance bidirectional device.
3. For bidirectional devices with a V_R of 10 volts or less, the I_R limit is double.

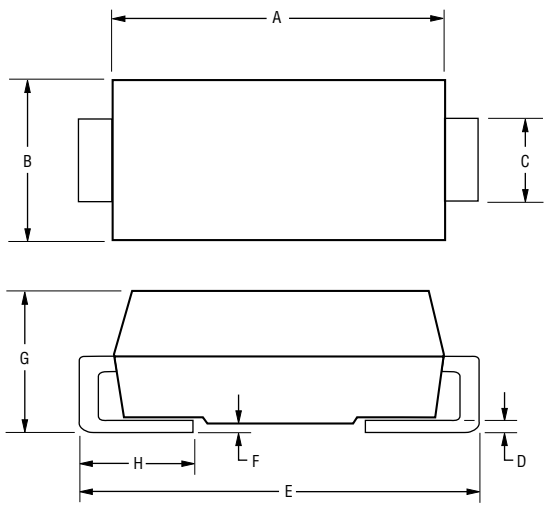
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SMBJ Transient Voltage Suppressor Diode Series

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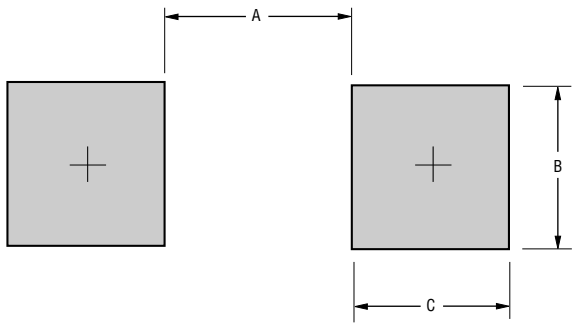
Product Dimensions



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	0.05 - 0.203 (0.002 - 0.008)
G	2.13 - 2.44 (0.084 - 0.096)
H	0.76 - 1.52 (0.030 - 0.060)

DIMENSIONS: MM (INCHES)

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: MM (INCHES)

Physical Specifications

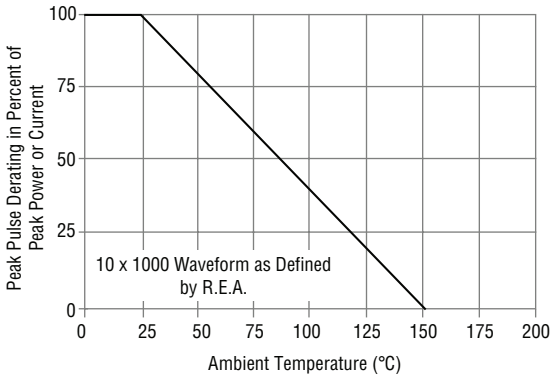
Case .....Molded plastic per UL Class 94V-0
Polarity..... Cathode band indicates unidirectional device
No cathode band indicates bidirectional device
Weight .....0.093 grams

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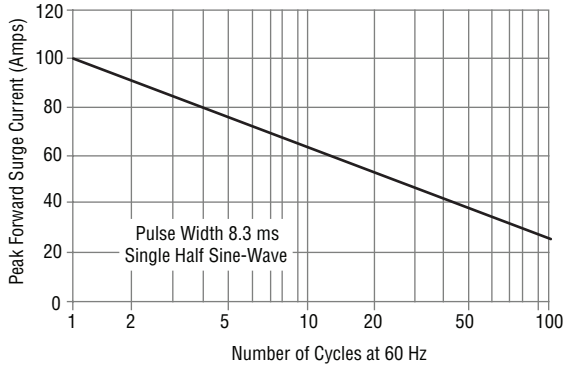
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Rating & Characteristic Curves

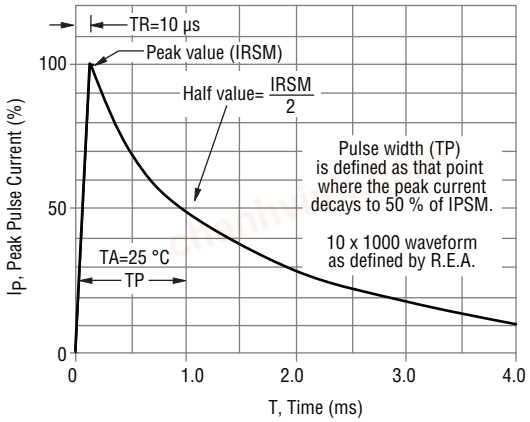
Pulse Derating Curve



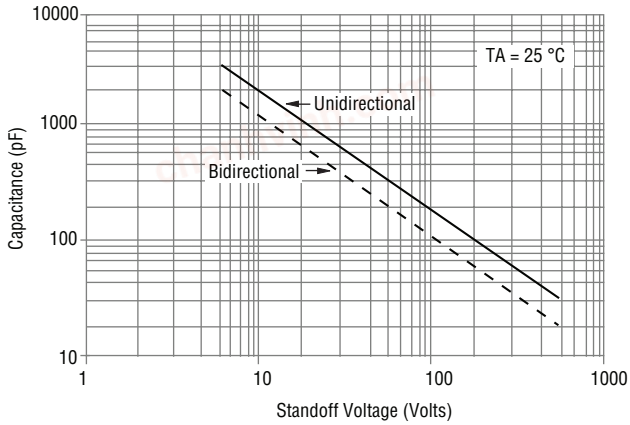
Maximum Non-Repetitive Surge Current



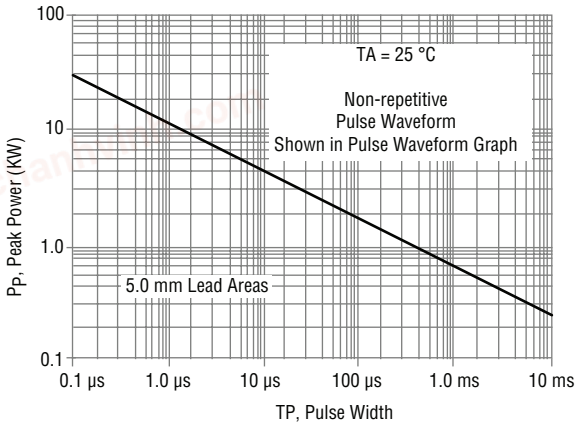
Pulse Waveform



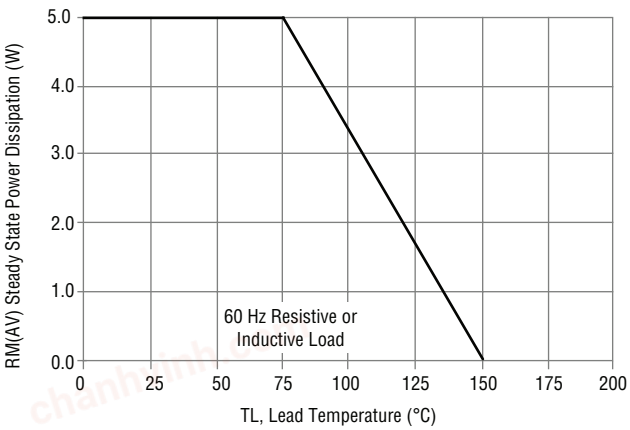
Typical Junction Capacitance



Pulse Rating Curve



Steady State Power Derating Curve

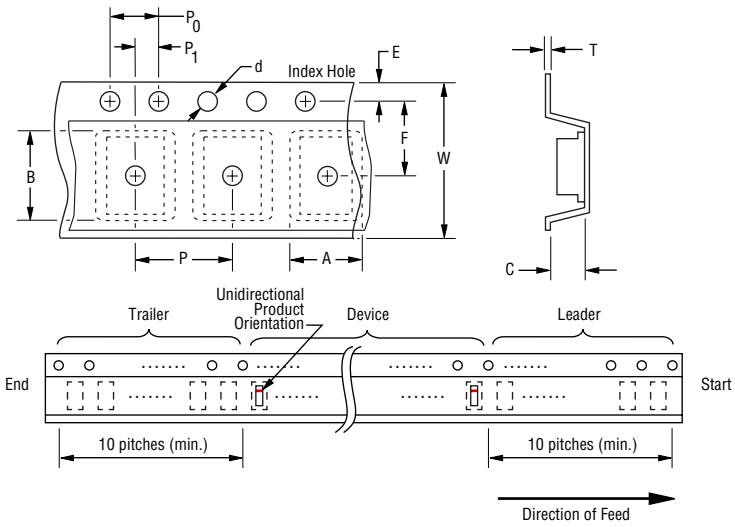


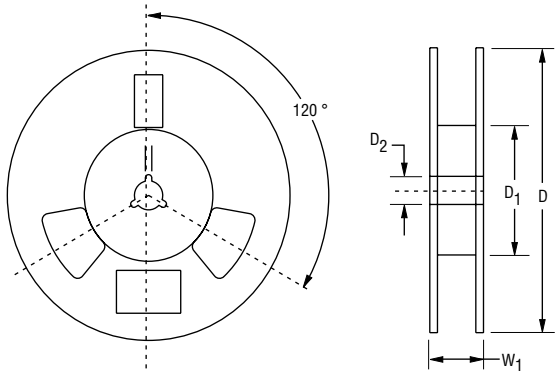
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Packaging Information

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





DIMENSIONS: MM / (INCHES)

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

Item	Symbol	SMB (DO-214AA)	
		7 Inch Reel	13 Inch Reel
Carrier Width	A	3.67 ± 0.20 (0.144 ± 0.008)	
Carrier Length	B	5.60 ± 0.20 (0.220 ± 0.008)	
Carrier Depth	C	2.57 ± 0.20 (0.101 ± 0.008)	
Sprocket Hole	d	1.50 ± 0.10 (0.059 ± 0.004)	
Reel Outside Diameter	D	178 (7.008)	330 (12.992)
Reel Inner Diameter	D_1	50.0 (1.969) MIN.	
Feed Hole Diameter	D_2	13.0 ± 0.20 (0.512 ± 0.008)	
Sprocket Hole Position	E	1.75 ± 0.10 (0.069 ± 0.004)	
Punch Hole Position	F	5.50 ± 0.05 (0.217 ± 0.002)	
Punch Hole Pitch	P	8.00 ± 0.10 (0.315 ± 0.004)	
Sprocket Hole Pitch	P_0	4.00 ± 0.10 (0.157 ± 0.004)	
Embossment Center	P_1	2.00 ± 0.05 (0.079 ± 0.002)	
Overall Tape Thickness	T	0.30 ± 0.10 (0.012 ± 0.004)	
Tape Width	W	12.00 ± 0.30 (0.472 ± 0.012)	
Reel Width	W_1	18.4 (0.724) MAX.	
Quantity per Reel	--	500	3,000

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