

# Silicon Avalanche Diodes

## 600W Surface Mount Transient Voltage Suppressors

### SMBJ Series



Protect sensitive electronics against voltage transients induced by inductive load switching and lightning. Ideal for the protection of I/O interfaces, Vcc bus and other integrated circuits.

#### FEATURES

- Stand-off Voltage Range 5.0 to 170 Volts
- Uni-directional and Bi-directional
- Glass passivated junction
- Jedec package designed to meet SM assembly needs
- Low head inductance
- 100% surge tested
- UL recognised

#### MAXIMUM RATING

- Peak Pulse Power (Ppk) 600 Watts (10 x 1000µs)@25°C (see diagram on page 3 for wave form)
- 1.5 watt steady state
- Response time:  $1 \times 10^{-12}$  secs (theoretical)
- Forward surge rating: 100A, 8.3 ms single half sine-wave (Uni-directional only)
- Operating & storage temp.: -55°C to +150°C

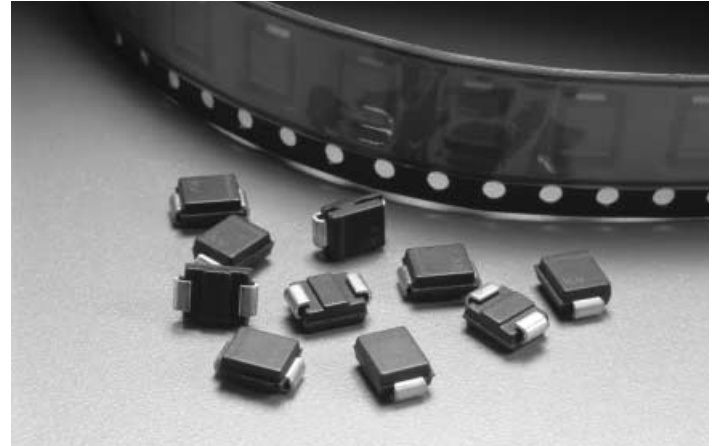
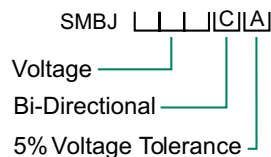
#### MECHANICAL CHARACTERISTICS

- Case: DO-214AA moulded plastic over glass passivated junction UL94V(O) (Thermoset) Epoxy
- Terminals: Solder plated solderable per MIL-STD-750 Method 2026
- Solderable leads: 230°C for 10 seconds.
- Marking: cathode band (positive terminal, uni-directional devices only), device code, logo

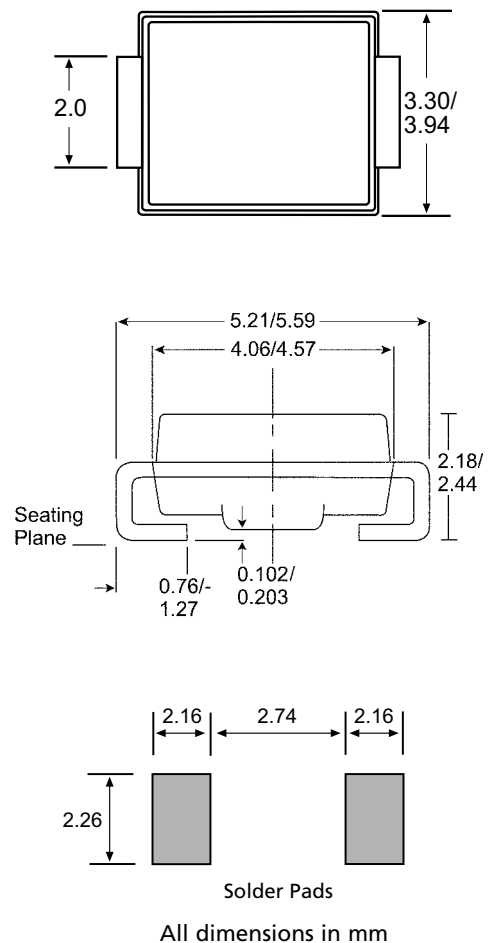
**Agency Approvals:** Recognized under the Components Program of Underwriters Laboratories.

**Agency File Numbers:** E128662

#### ORDERING INFORMATION



SILICON DIODE ARRAYS



# Silicon Avalanche Diodes

600W Surface Mount Transient Voltage Suppressors

## SMBJ Series

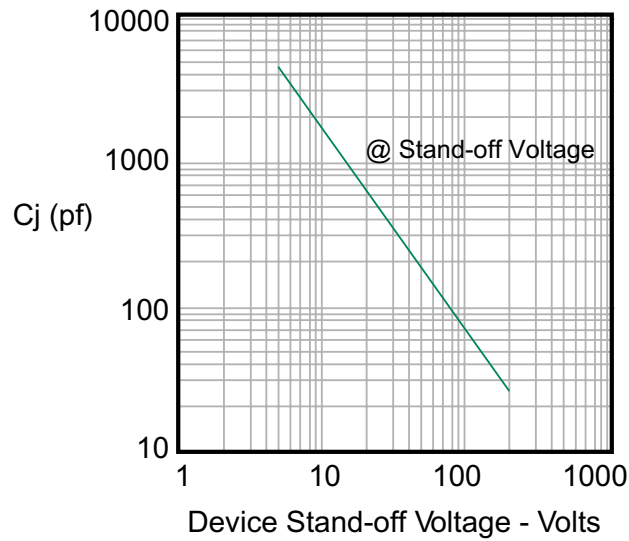


Figure 1 - Capacitance

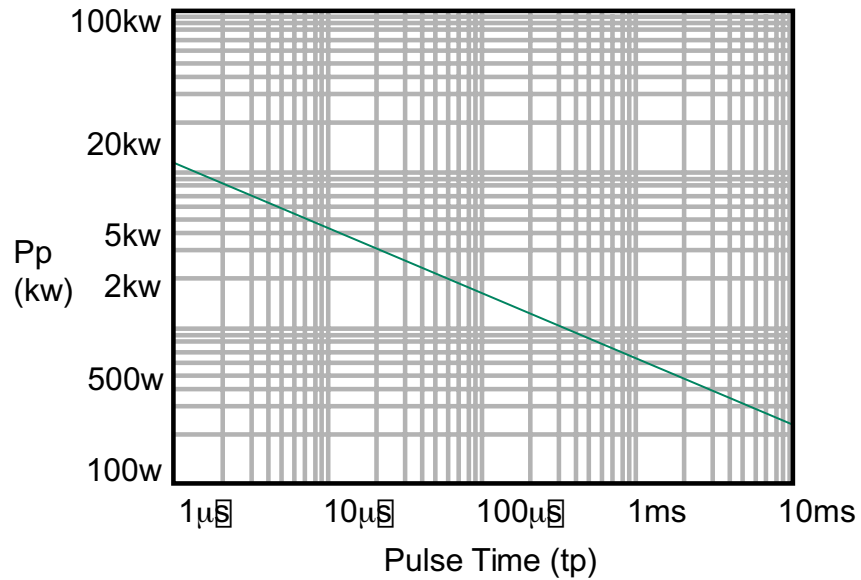


Figure 2 - Peak Pulse Power vs. Pulse Time

# Silicon Avalanche Diodes

## 600W Surface Mount Transient Voltage Suppressors

### SMBJ Series



#### ELECTRICAL SPECIFICATION @ Tamb 25°C

Part Number Uni-Polar	Device Code Uni-Polar	Part Number Bi-Polar	Device Code Bi-Polar 'C' or 'CA' Version	Reverse Stand Off Voltage V <sub>R</sub> (Volts)	Breakdown Voltage V <sub>BR</sub> (Volts) @ I <sub>T</sub>			Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (µA)	Maximum Clamping Voltage V <sub>C</sub> @ I <sub>PP</sub> (Volts)	Maximum Peak Pulse Current I <sub>PP</sub> (A)
					MIN	MAX	(mA)			
SMBJ5.0*	KD	SMBJ5.0C*	AD	5.0	6.40	N/A	10	800.0	9.6	62.5
SMBJ5.0A*	KE	SMBJ5.0CA*	AE	5.0	6.40	N/A	10	800.0	9.2	65.2
SMBJ6.0*	KF	SMBJ6.0C*	AF	6.0	6.67	N/A	10	800.0	11.4	52.6
SMBJ6.0A*	KG	SMBJ6.0CA*	AG	6.0	6.67	N/A	10	800.0	10.3	58.3
SMBJ6.5	KH	SMBJ6.5C	AH	6.5	7.22	N/A	10	500.0	12.3	48.7
SMBJ6.5A	KK	SMBJ6.5CA	AK	6.5	7.22	N/A	10	500.0	11.2	53.6
SMBJ7.0	KL	SMBJ7.0C	AL	7.0	7.78	N/A	10	200.0	13.3	45.1
SMBJ7.0A	KM	SMBJ7.0CA	AM	7.0	7.78	N/A	10	200.0	12.0	50.0
SMBJ7.5	KN	SMBJ7.5C*	AN	7.5	8.33	N/A	1	100.0	14.3	42.0
SMBJ7.5A	KP	SMBJ7.5CA*	AP	7.5	8.33	N/A	1	100.0	12.9	46.5
SMBJ8.0	KQ	SMBJ8.0C	AQ	8.0	8.89	N/A	1	50.0	15.0	40.0
SMBJ8.0A	KR	SMBJ8.0CA	AR	8.0	8.89	N/A	1	50.0	13.6	44.1
SMBJ8.5*	KS	SMBJ8.5C*	AS	8.5	9.44	N/A	1	20.0	15.9	37.7
SMBJ8.5A*	KT	SMBJ8.5CA*	AT	8.5	9.44	N/A	1	20.0	14.4	41.7
SMBJ9.0	KU	SMBJ9.0C	AU	9.0	10.00	N/A	1	10.0	16.9	35.5
SMBJ9.0A	KV	SMBJ9.0CA	AV	9.0	10.00	N/A	1	10.0	15.4	39.0
SMBJ10	KW	SMBJ10C	AW	10.0	11.10	N/A	1	5.0	18.8	31.9
SMBJ10A	KX	SMBJ10CA	AX	10.0	11.10	N/A	1	5.0	17.0	35.3
SMBJ11	KY	SMBJ11C	AY	11.0	12.20	N/A	1	5.0	20.1	29.9
SMBJ11A	KZ	SMBJ11CA	AZ	11.0	12.20	N/A	1	5.0	18.2	33.0
SMBJ12*	LD	SMBJ12C*	BD	12.0	13.30	N/A	1	5.0	22.0	27.3
SMBJ12A*	LE	SMBJ12CA*	BE	12.0	13.30	N/A	1	5.0	19.9	30.2
SMBJ13	LF	SMBJ13C*	BF	13.0	14.40	N/A	1	5.0	23.8	25.2
SMBJ13A	LG	SMBJ13CA*	BG	13.0	14.40	N/A	1	5.0	21.5	27.9
SMBJ14	LH	SMBJ14C	BH	14.0	15.60	N/A	1	5.0	25.8	23.3
SMBJ14A	LK	SMBJ14CA	BK	14.0	15.60	N/A	1	5.0	23.2	25.8
SMBJ15*	LL	SMBJ15C*	BL	15.0	16.70	N/A	1	5.0	26.9	22.3
SMBJ15A*	LM	SMBJ15CA*	BM	15.0	16.70	N/A	1	5.0	24.4	24.0
SMBJ16	LN	SMBJ16C	BN	16.0	17.80	N/A	1	5.0	28.8	20.8
SMBJ16A	LP	SMBJ16CA	BP	16.0	17.80	N/A	1	5.0	26.0	23.1
SMBJ17	LQ	SMBJ17C	BQ	17.0	18.90	N/A	1	5.0	30.5	19.7
SMBJ17A	LR	SMBJ17CA	BR	17.0	18.90	N/A	1	5.0	27.6	21.0

Note: Non 'A' devices have higher clamping voltage. Add suffix 'C' to denote bi-polar devices. V<sub>BR</sub> max not quoted.

1. For Bi-directional devices having V<sub>R</sub> of 10 volts and below, the I<sub>R</sub> limit is doubled.
2. For Uni-directional devices V<sub>F</sub> = 3.5 Volts max at I<sub>F</sub> = 50A, 300 µs square wave pulse. \* Preferred voltages.

# Silicon Avalanche Diodes

600W Surface Mount Transient Voltage Suppressors

## SMBJ Series



### ELECTRICAL SPECIFICATION @ Tamb 25°C

Part Number Uni-Polar	Device Code Uni-Polar	Part Number Bi-Polar	Device Code Bi-Polar 'C' or 'CA' Version	Reverse Stand Off Voltage V <sub>R</sub> (Volts)	Breakdown Voltage V <sub>BR</sub> (Volts) @ I <sub>T</sub>			Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (µA)	Maximum Clamping Voltage V <sub>C</sub> @ I <sub>PP</sub> (Volts)	Maximum Peak Pulse Current I <sub>PP</sub> (A)
					MIN	MAX	(mA)			
SMBJ18*	LS	SMBJ18C	BS	18.0	20.00	N/A	1	5.0	32.2	18.6
SMBJ18A*	LT	SMBJ18CA	BT	18.0	20.00	N/A	1	5.0	29.2	20.5
SMBJ20	LU	SMBJ20C	BU	20.0	22.20	N/A	1	5.0	35.8	16.7
SMBJ20A	LV	SMBJ20CA	BV	20.0	22.20	N/A	1	5.0	32.4	18.5
SMBJ22	LW	SMBJ22C*	BW	22.0	24.40	N/A	1	5.0	39.4	15.2
SMBJ22A	LX	SMBJ22CA*	BX	22.0	24.40	N/A	1	5.0	35.5	16.9
SMBJ24	LY	SMBJ24C*	BY	24.0	26.70	N/A	1	5.0	43.0	14.0
SMBJ24A	LZ	SMBJ24CA*	BZ	24.0	26.70	N/A	1	5.0	38.9	15.4
SMBJ26*	MD	SMBJ26C	CD	26.0	28.90	N/A	1	5.0	46.6	12.4
SMBJ26A*	ME	SMBJ26CA	CE	26.0	28.90	N/A	1	5.0	42.1	14.2
SMBJ28	MF	SMBJ28C	CF	28.0	31.10	N/A	1	5.0	50.0	12.0
SMBJ28A	MG	SMBJ28CA	CG	28.0	31.10	N/A	1	5.0	45.4	13.2
SMBJ30	MH	SMBJ30C	CH	30.0	33.30	N/A	1	5.0	53.5	11.2
SMBJ30A	MK	SMBJ30CA	CK	30.0	33.30	N/A	1	5.0	46.6	12.4
SMBJ33*	ML	SMBJ33C	CL	33.0	36.70	N/A	1	5.0	59.0	10.2
SMBJ33A*	MM	SMBJ33CA	CM	33.0	36.70	N/A	1.0	5.0	53.3	11.3
SMBJ36*	MN	SMBJ36C*	CN	36.0	40.00	N/A	1.0	5.0	64.3	9.3
SMBJ36A	MP	SMBJ36CA*	CP	36.0	40.00	N/A	1.0	5.0	58.1	10.3
SMBJ40	MQ	SMBJ40C	CQ	40.0	44.40	N/A	1.0	5.0	71.4	8.4
SMBJ40A	MR	SMBJ40CA	CR	40.0	44.40	N/A	1.0	5.0	64.5	9.3
SMBJ43	MS	SMBJ43C	CS	43.0	47.80	N/A	1.0	5.0	76.7	7.8
SMBJ43A	MT	SMBJ43CA	CT	43.0	47.80	N/A	1.0	5.0	69.4	8.6
SMBJ45	MU	SMBJ45C	CU	45.0	50.00	N/A	1.0	5.0	80.3	7.5
SMBJ45A	MV	SMBJ45CA	CV	45.0	50.00	N/A	1.0	5.0	72.7	8.3
SMBJ48	MW	SMBJ48C	CW	48.0	53.30	N/A	1.0	5.0	85.5	7.0
SMBJ48A	MX	SMBJ48CA	CX	48.0	53.30	N/A	1.0	5.0	77.4	7.7
SMBJ51	MY	SMBJ51C*	CY	51.0	56.70	N/A	1.0	5.0	91.1	6.6
SMBJ51A	MZ	SMBJ51CA*	CZ	51.0	56.70	N/A	1.0	5.0	82.4	7.3
SMBJ54	ND	SMBJ54C	DD	54.0	60.00	N/A	1.0	5.0	96.3	6.2
SMBJ54A	NE	SMBJ54CA	DE	54.0	60.00	N/A	1.0	5.0	87.1	6.9
SMBJ58	NF	SMBJ58C	DF	58.0	64.40	N/A	1.0	5.0	103.0	5.8

Note: Non 'A' devices have higher clamping voltage. Add suffix 'C' to denote bi-polar devices. V<sub>BR</sub> max not quoted.

1. For Bi-directional devices having V<sub>R</sub> of 10 volts and below, the I<sub>R</sub> limit is doubled.
2. For Uni-directional devices V<sub>F</sub> = 3.5 Volts max at I<sub>F</sub> = 50A, 300 µs square wave pulse. \* Preferred voltages.

# Silicon Avalanche Diodes

600W Surface Mount Transient Voltage Suppressors

## SMBJ Series



### ELECTRICAL SPECIFICATION @ Tamb 25°C

Part Number Uni-Polar	Device Code Uni-Polar	Part Number Bi-Polar	Device Code Bi-Polar 'C' or 'CA' Version	Reverse Stand Off Voltage V <sub>R</sub> (Volts)	Breakdown Voltage V <sub>BR</sub> (Volts) @ I <sub>T</sub>			Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (µA)	Maximum Clamping Voltage V <sub>C</sub> @ I <sub>PP</sub> (Volts)	Maximum Peak Pulse Current I <sub>PP</sub> (A)
					MIN	MAX	(mA)			
SMBJ58A	NG	SMBJ58CA	DG	58.0	64.40	N/A	1.0	5.0	93.6	6.4
SMBJ60	NH	SMBJ60C	DH	60.0	66.70	N/A	1.0	5.0	107.0	5.6
SMBJ60A	NK	SMBJ60CA	DK	60.0	66.70	N/A	1.0	5.0	96.8	6.2
SMBJ64	NL	SMBJ64C	DL	64.0	71.10	N/A	1.0	5.0	114.0	5.3
SMBJ64A	NM	SMBJ64CA	DM	64.0	71.10	N/A	1.0	5.0	103.0	5.8
SMBJ70	NN	SMBJ70C	DN	70.0	77.80	N/A	1.0	5.0	125.0	4.8
SMBJ70A	NP	SMBJ70CA	DP	70.0	77.80	N/A	1.0	5.0	113.0	5.3
SMBJ75	NQ	SMBJ75C	DQ	75.0	83.30	N/A	1.0	5.0	134.0	4.5
SMBJ75A	NR	SMBJ75CA	DR	75.0	83.30	N/A	1.0	5.0	121.0	4.9
SMBJ78	NS	SMBJ78C	DS	78.0	86.70	N/A	1.0	5.0	139.0	4.3
SMBJ78A	NT	SMBJ78CA	DT	78.0	86.70	N/A	1.0	5.0	126.0	4.7
SMBJ85	NU	SMBJ85C	DU	85.0	94.40	N/A	1.0	5.0	151.0	3.9
SMBJ85A	NV	SMBJ85CA	DV	85.0	94.40	N/A	1.0	5.0	137.0	4.4
SMBJ90	NW	SMBJ90C	DW	90.0	100.00	N/A	1.0	5.0	160.0	3.8
SMBJ90A	NX	SMBJ90CA	DX	90.0	100.00	N/A	1.0	5.0	146.0	4.1
SMBJ100	NY	SMBJ100C	DY	100.0	111.00	N/A	1.0	5.0	179.0	3.4
SMBJ100A	NZ	SMBJ100CA	DZ	100.0	111.00	N/A	1.0	5.0	162.0	3.7
SMBJ110	PD	SMBJ110C	ED	110.0	122.00	N/A	1.0	5.0	196.0	3.0
SMBJ110A	PE	SMBJ110CA	EE	110.0	122.00	N/A	1.0	5.0	177.0	3.4
SMBJ120	PF	SMBJ120C	EF	120.0	133.00	N/A	1.0	5.0	214.0	2.8
SMBJ120A	PG	SMBJ120CA	EG	120.0	133.00	N/A	1.0	5.0	193.0	3.1
SMBJ130	PH	SMBJ130C	EH	130.0	144.00	N/A	1.0	5.0	231.0	2.6
SMBJ130A	PK	SMBJ130CA	EK	130.0	144.00	N/A	1.0	5.0	209.0	2.9
SMBJ150*	PL	SMBJ150C	EL	150.0	167.00	N/A	1.0	5.0	268.0	2.2
SMBJ150A*	PM	SMBJ150CA	EM	150.0	167.00	N/A	1.0	5.0	243.0	2.5
SMBJ160	PN	SMBJ160C	EN	160.0	178.00	N/A	1.0	5.0	287.0	2.1
SMBJ160A	PP	SMBJ160CA	EP	160.0	178.00	N/A	1.0	5.0	259.0	2.3
SMBJ170	PQ	SMBJ170C*	EQ	170.0	189.00	N/A	1.0	5.0	304.0	2.0
SMBJ170A	PR	SMBJ170CA	ER	170.0	189.00	N/A	1.0	5.0	275.0	2.2
SMBJ188A	PS	SMBJ188CA	ES	188.0	209.00	N/A	1.0	5.0	328.0	2.0

Note: Non 'A' devices have higher clamping voltage. Add suffix 'C' to denote bi-polar devices. V<sub>BR</sub> max not quoted.

1. For Bi-directional devices having V<sub>R</sub> of 10 volts and below, the I<sub>R</sub> limit is doubled.
2. For Uni-directional devices V<sub>f</sub> = 3.5 Volts max at I<sub>f</sub> = 50A, 300 µs square wave pulse. \* Preferred voltages.