TEL: 805-498-2111 FAX: 805-498-3804

DESCRIPTION

The SMCJ series of transient voltage suppressors are designed to protect components from transient voltages caused by lightning, electrostatic discharge **(ESD)**, electrical fast transients **(EFT)**, inductive load switching, and AC line fluctuations.

TVS diodes are characterized by their high surge capability, low operating and clamping voltages, and fast response time. This makes them ideal for use as board level protection of sensitive semiconductor components. The SMCJ series is suitable protection for sensitive TTL and MOS ICs such as microprocessors, I/O transceivers, ASICs, transducers, and MOS memory.

APPLICATIONS:

- General Transient Protection
- Board Level Surface Mount Applications
- Industrial & Commercial Electronics
- Portable electronics
- Networks

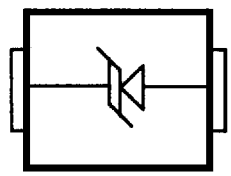
FEATURES:

- 1500 watts Peak Pulse Power (tp = 10 x 1000 µs)
- Unidirectional or Bidirectional
- Wide voltage range (5V - 170V)
- Low clamping voltages
- Solid state silicon avalanche technology

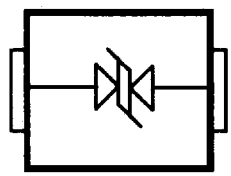
MECHANICAL CHARACTERISTICS:

- JEDEC DO-214AB Outline
- Molded epoxy case
- Marking : Device code and logo
- Unidirectional devices marked with polarity band

SCHEMATIC



Unidirectional



Bidirectional

MAXIMUM RATINGS

RATING	SYMBOL	VALUE	UNIT
Peak Pulse Power (tp = 10 x 1000 µs)	Ppk	1500	Watts
Operating Temperature	Tj	-55 to +150	°C
Storage Temperature	Tstg	-55 to +150	°C

ELECTRICAL CHARACTERISTICS @ 25°C

UNI-DIRECTIONAL PART NUMBER Note 1.	DEVICE MARKING CODE	BI-DIRECTIONAL PART NUMBER Note 1, 2	DEVICE MARKING CODE	REVERSE STAND-OFF VOLTAGE V_{RWM} (V)	REVERSE LEAKAGE @ V_{RWM} (I_R) (µA)	BREAKDOWN VOLTAGE V_{BR} MIN @ I_T (V)	TEST CURRENT I_T (mA)	MAXIMUM CLAMPING VOLTAGE @ I_{PP} (V_C) (V)	PEAK PULSE CURRENT (I_{PP}) (A)	MAX. VOLTAGE TEMPERATURE VARIATION OF V_{BR} (mV/°C)
SMCJ5.0♦	GDD			5.0	1000	6.40	10	9.6	156.2	5.0
SMCJ5.0A♦	GDE			5.0	1000	6.40	10	9.2	163.0	5.0
SMCJ6.0 ♦	GDF	SMCJ6.0C ♦	BDF	6.0	1000	6.67	10	11.4	131.6	5.0
SMCJ6.0A♦	GDG	SMCJ6.0CA♦	BDG	6.0	1000	6.67	10	10.3	145.6	5.0
SMCJ6.5	GDH	SMCJ6.5C ♦	BDH	6.5	500	7.22	10	12.3	122.0	5.0
SMCJ6.5A	GDK	SMCJ6.5CA♦	BDK	6.5	500	7.22	10	11.2	133.9	5.0
SMCJ7.0	GDL	SMCJ7.0C	BDL	7.0	200	7.78	10	12.9	112.8	6.0
SMCJ7.0A	GDM	SMCJ7.0CA	BDM	7.0	200	7.78	10	12.0	125.0	6.0
SMCJ7.5	GDN	SMCJ7.5C	BDN	7.5	100	8.33	1	14.5	104.9	7.0
SMCJ7.5A	GDP	SMCJ7.5CA	BDP	7.5	100	8.33	1	12.9	116.3	7.0
SMCJ8.0	GDQ	SMCJ8.0C	BDQ	8.0	50	8.89	1	15.0	100.0	7.0
SMCJ8.0A	GDR	SMCJ8.0CA	BDR	8.0	50	8.89	1	13.6	110.3	7.0
SMCJ8.5 ♦	GDS	SMCJ8.5C ♦	BDS	8.5	10	9.44	1	15.9	94.3	8.0
SMCJ8.5A♦	GDT	SMCJ8.5CA♦	BDT	8.5	10	9.44	1	14.4	104.2	8.0
SMCJ9.0	GDU	SMCJ9.0C	BDU	9.0	5	10.0	1	16.9	88.7	9.0
SMCJ9.0A	GDV	SMCJ9.0CA	BDV	9.0	5	10.0	1	15.4	97.4	9.0

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ELECTRICAL CHARACTERISTICS @ 25°C (CONTINUED)

UNI-DIRECTIONAL PART NUMBER Note 1.	DEVICE MARKING CODE	BI-DIRECTIONAL PART NUMBER Note 1, 2	DEVICE MARKING CODE	REVERSE STAND-OFF VOLTAGE V_{RWM} (V)	REVERSE LEAKAGE @ V_{RWM} (I_R) (μA)	BREAKDOWN VOLTAGE V_{BR} MIN @ I_T (V)	TEST CURRENT I_T (mA)	MAXIMUM CLAMPING VOLTAGE @ Ipp (V_C) (V)	PEAK PULSE CURRENT (Ipp) (A)	MAX. VOLTAGE TEMPERATURE VARIATION OF V_{BR} (mV/°C)
SMCJ10 ♦	GDW	SMCJ10C	BDW	10	5	11.1	1	15.8	79.8	10
SMCJ10A♦	GDX	SMCJ10CA	BDX	10	5	11.1	1	17.0	88.2	10
SMCJ11	GDY	SMCJ11C	BDY	11	5	12.2	1	20.1	74.6	11
SMCJ11A	GDZ	SMCJ11CA	BDZ	11	5	12.2	1	18.2	82.4	11
SMCJ12 ♦	GED	SMCJ12C ♦	BED	12	5	13.3	1	22.0	68.2	12
SMCJ12A♦	GEE	SMCJ12CA ♦	BEE	12	5	13.3	1	19.9	75.3	12
SMCJ13	GEF	SMCJ13C	BEF	13	5	14.4	1	23.8	63.0	13
SMCJ13A	GEG	SMCJ13CA	BEG	13	5	14.4	1	21.5	69.7	13
SMCJ14	GEH	SMCJ14C	BEH	14	5	15.6	1	25.8	58.1	14
SMCJ14A	GEK	SMCJ14CA	BEK	14	5	15.6	1	23.2	64.7	14
SMCJ15 ♦	GEL	SMCJ15C ♦	BEL	15	5	16.7	1	26.9	55.8	16
SMCJ15A♦	GEM	SMCJ15CA ♦	BEM	15	5	16.7	1	24.4	61.5	16
SMCJ16	GEN	SMCJ16C	BEN	16	5	17.8	1	28.8	52.1	19
SMCJ16A	GEP	SMCJ16CA	BEP	16	5	17.8	1	26.0	57.7	17
SMCJ17	GEQ	SMCJ17C	BEQ	17	5	18.9	1	30.5	49.2	20
SMCJ17A	GER	SMCJ17CA	BER	17	5	18.9	1	27.6	53.3	19
SMCJ18	GES	SMCJ18C	BES	18	5	20.0	1	32.2	46.6	21
SMCJ18A	GET	SMCJ18CA	BET	18	5	20.0	1	29.2	51.4	20
SMCJ20	GEU	SMCJ20C	BEU	20	5	22.2	1	35.8	41.9	25
SMCJ20A	GEV	SMCJ20CA	BEV	20	5	22.2	1	32.4	46.3	23
SMCJ22	GEW	SMCJ22C	BEW	22	5	24.4	1	35.4	38.1	28
SMCJ22A	GEX	SMCJ22CA	BEX	22	5	24.4	1	35.5	42.2	25
SMCJ24 ♦	GEY	SMCJ24C ♦	BEY	24	5	26.7	1	43.0	34.9	31
SMCJ24A♦	GEZ	SMCJ24CA ♦	BEZ	24	5	26.7	1	38.9	38.6	28
SMCJ26	GFD	SMCJ26C	BFD	26	5	28.9	1	42.6	32.2	31
SMCJ26A	GFE	SMCJ26CA	BFE	26	5	28.9	1	42.1	35.6	30
SMCJ28 ♦	GFF	SMCJ28C ♦	BFF	28	5	31.1	1	50.0	30.0	35
SMCJ28A♦	GFG	SMCJ28CA ♦	BFG	28	5	31.1	1	45.4	33.0	31
SMCJ30	GFH	SMCJ30C	BFH	30	5	33.3	1	53.5	28.0	39
SMCJ30A	GFK	SMCJ30CA	BFK	30	5	33.3	1	48.4	31.0	36
SMCJ33 ♦	GFL	SMCJ33C ♦	BFL	33	5	36.7	1	59.0	25.2	42
SMCJ33A♦	GFM	SMCJ33CA ♦	BFM	33	5	36.7	1	53.3	28.1	39
SMCJ36	GFN	SMCJ36C	BFN	36	5	40.0	1	64.3	23.3	46
SMCJ36A	GFP	SMCJ36CA	BFP	36	5	40.0	1	58.1	25.8	41
SMCJ40 ♦	GFQ	SMCJ40C ♦	BFQ	40	5	44.4	1	71.4	21.0	51
SMCJ40A♦	GFR	SMCJ40CA ♦	BFR	40	5	44.4	1	64.5	32.2	46
SMCJ43	GFS	SMCJ43C	BFS	43	5	47.8	1	78.7	19.6	56
SMCJ43A	GFT	SMCJ43CA	BFT	43	5	47.8	1	69.4	21.6	50
SMCJ45	GFU	SMCJ45C	BFU	45	5	50.0	1	80.3	18.7	58
SMCJ45A	GFV	SMCJ45CA	BFV	45	5	50.0	1	72.7	20.6	52
SMCJ48	GFW	SMCJ48C	BFW	48	5	53.3	1	86.5	17.5	63
SMCJ48A	GFX	SMCJ48CA	BFX	48	5	53.3	1	77.4	19.4	58
SMCJ51	GFY	SMCJ51C	BFY	51	5	56.7	1	91.1	16.5	66
SMCJ51A	GFZ	SMCJ51CA	BFZ	51	5	56.7	1	82.4	18.2	61
SMCJ54	GGD	SMCJ54C	BGD	54	5	60.0	1	96.3	15.6	71
SMCJ54A	GGE	SMCJ54CA	BGE	54	5	60.0	1	87.1	17.2	65
SMCJ58 ♦	GGF	SMCJ58C ♦	BGF	58	5	64.4	1	103.0	14.6	78
SMCJ58A♦	GGG	SMCJ58CA ♦	BGG	58	5	64.4	1	93.6	16.0	70
SMCJ60	GGH	SMCJ60C	BGH	60	5	66.7	1	107.0	14.0	80
SMCJ60A	GGK	SMCJ60CA	BGK	60	5	66.7	1	96.8	15.5	71
SMCJ64 ♦	GGL	SMCJ64C ♦	BGL	64	5	71.1	1	114.0	13.2	86
SMCJ64A♦	GGM	SMCJ64CA ♦	BGM	64	5	71.1	1	103.0	14.6	78
SMCJ70	GGN	SMCJ70C	BGN	70	5	77.8	1	125	12.0	94
SMCJ70A	GGP	SMCJ70CA	BGP	70	5	77.8	1	113	13.3	85
SMCJ75	GGQ	SMCJ75C ♦	BGQ	75	5	83.3	1	134	11.2	101
SMCJ75A	GGR	SMCJ75CA ♦	BGR	75	5	83.3	1	121	12.4	91
SMCJ78	GGS	SMCJ78C	BGS	78	5	86.7	1	139	10.8	105
SMCJ78A	GGT	SMCJ78CA	BGT	78	5	86.7	1	126	11.4	95
SMCJ85	GGU	SMCJ85C	BGU	85	5	94.4	1	151	9.9	114
SMCJ85A	GGV	SMCJ85CA	BGV	85	5	94.4	1	137	10.4	103
SMCJ90	GGW	SMCJ90C	BGW	90	5	100	1	160	9.4	121
SMCJ90A	GGX	SMCJ90CA	BGX	90	5	100	1	146	10.3	110
SMCJ100	GGY	SMCJ100C	BGY	100	5	111	1	179	8.4	135
SMCJ100A	GGZ	SMCJ100CA	BGZ	100	5	111	1	162	9.3	123
SMCJ110	GHD	SMCJ110C	BHD	110	5	122	1	198	7.7	148
SMCJ110A	GHE	SMCJ110CA	BHE	110	5	122	1	177	8.4	133
SMCJ120	GHF	SMCJ120C ♦	BHF	120	5	133	1	214	7.0	162
SMCJ120A	GHG	SMCJ120CA♦	BHG	120	5	133	1	193	7.9	146
SMCJ130	GHH	SMCJ130C	BHH	130	5	144	1	231	6.5	175
SMCJ130A	GHK	SMCJ130CA	BHK	130	5	144	1	209	7.2	158
SMCJ150	GHL	SMCJ150C	BHL	150	5	167	1	268	5.6	203
SMCJ150A	GHM	SMCJ150CA	BHM	150	5	167	1	243	6.2	184
SMCJ160	GHN	SMCJ160C	BHN	160	5	178	1	287	5.2	217
SMCJ160A	GHP	SMCJ160CA	BHP	160	5	178	1	259	5.8	196
SMCJ170	GHQ	SMCJ170C ♦	BHQ	170	5	189	1	304	4.9	230
SMCJ170A	GHR	SMCJ170CA♦	BHR	170	5	189	1	275	5.5	208

NOTE 1 : "A" = ±5% of nominal V_{BR}, standard tolerance is ±10%.
NOTE 2 : Bidirectional devices have symmetrical avalanche characteristics in both directions.
NOTE 3 : For bidirectional devices with VRWM ≤ 10 volts, the IR limit is doubled.
♦ : Popular / Recommended part types

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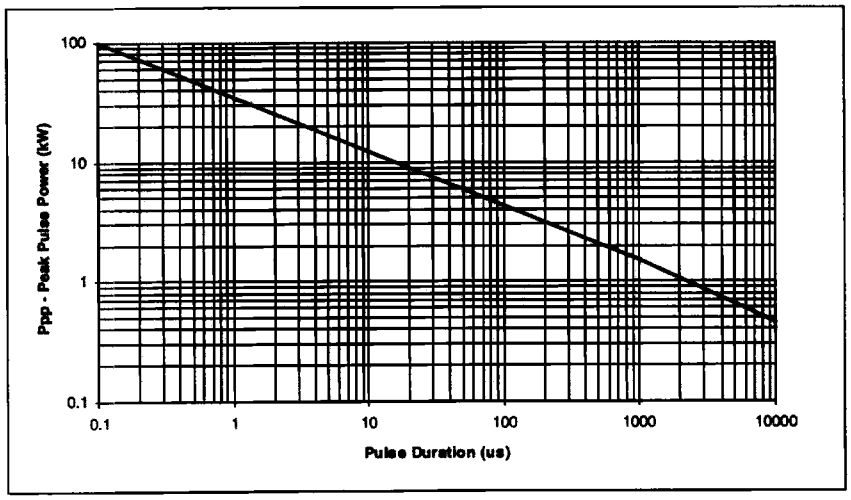
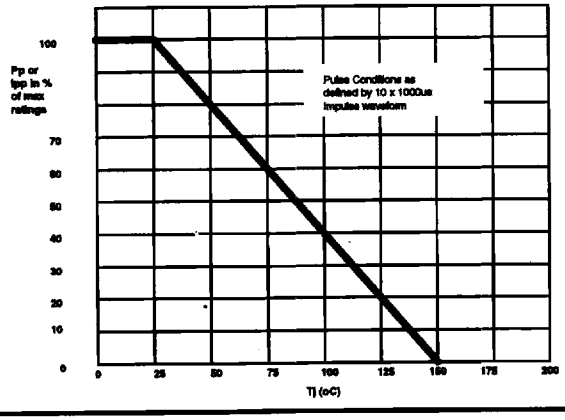
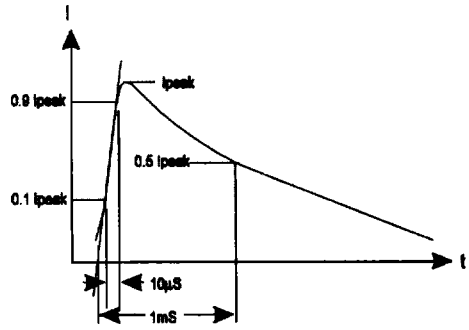
PEAK PULSE POWER vs. PULSE TIME



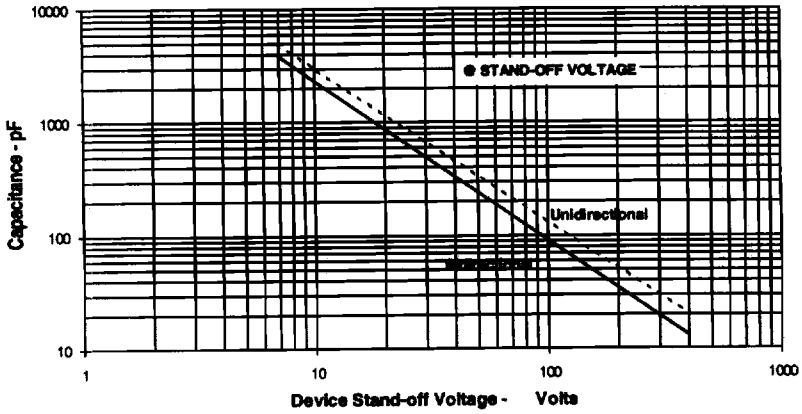
PULSE DERATING CURVE



10x1000µs IMPULSE WAVEFORM



CAPACITANCE vs. WORKING VOLTAGE



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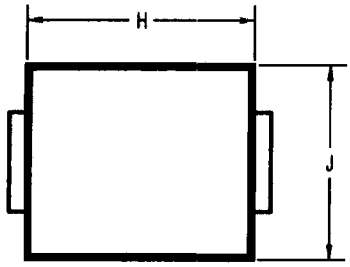
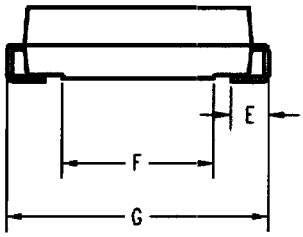
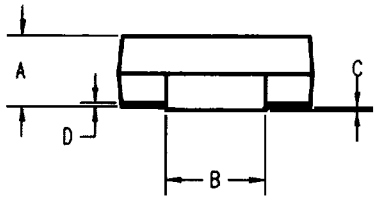
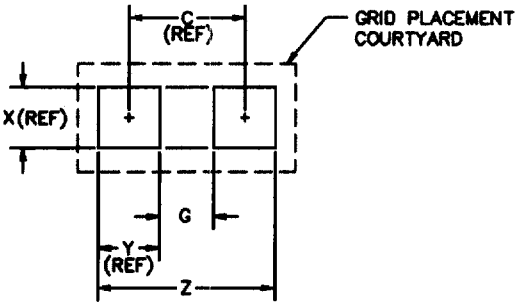
MECHANICAL OUTLINE & LAND PATTERN - DO-214AB



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.075	.095	1.90	2.41	
B	.115	.125	2.92	3.18	
C	.004	.008	.10	.20	
D	–	.020	–	.51	
E	.030	.060	.76	1.52	
F	.175	.185	4.44	4.70	
G	.305	.320	7.75	8.13	
H	.260	.280	6.60	7.11	
J	.220	.245	5.59	6.22	







DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
C	–	.281	–	7.03	–
G	.168	.171	4.20	4.28	–
X	.146	.150	3.65	3.75	–
Y	–	.110	–	2.79	–
Z	.381	.391	9.53	9.78	–

TYPICAL APPLICATION : IC PROTECTION

Transient protection for integrated circuits is recommended at the power supply line and signal line interfaces which exit the equipment. A generic application is shown below.