

# SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS

## VOLTAGE RANGE

**5.0 to 440 Volts**

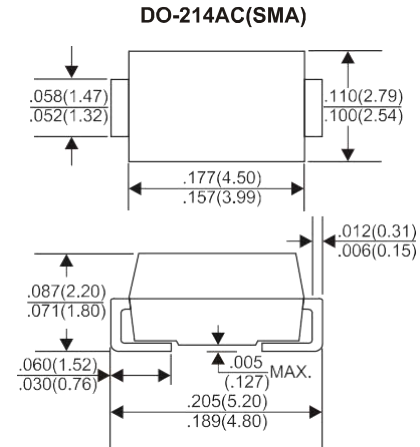
**400 Watts Peak Power**

## FEATURES

- \* For surface mount application
- \* Built-in strain relief
- \* Excellent clamping capability
- \* Low profile package
- \* Fast response time: Typically less than 1.0ps from 0 volt to BV min.
- \* Typical  $I_k$  less than  $1\mu A$  above 10V
- \* High temperature soldering guaranteed: 260°C / 10 seconds at terminals

## MECHANICAL DATA

- \* Case: Molded plastic
- \* Epoxy: UL 94V-0 rate flame retardant
- \* Lead: Solderable per MIL-STD-202, method 208 guaranteed
- \* Polarity: Color band denotes cathode end except Bidirectional
- \* Mounting position: Any



Dimensions in inches and (millimeters)



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating 25°C ambient temperature unless otherwise specified.  
 Single phase half wave, 60Hz, resistive or inductive load.  
 For capacitive load, derate current by 20%.

RATINGS	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ C$ , $T_p=1ms$ (NOTE 1)	$P_{PK}$	Minimum 400	Watts
Power Dissipation on infinite heatsink at $T_L=75^\circ C$	$P_D$	1.0	Watt
Peak Forward Surge Current at 8.3ms Single Half Sine-Wave superimposed on rated load (JEDEC method) (NOTE 3)	$I_{FSM}$	40	Amps
Maximum Instantaneous Forward Voltage at 25.0A for Unidirectional only	$V_F$	3.5/5.0	Volts
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

### NOTES:

1. Non-repetitive current pulse per Fig. 3 and derated above  $T_A=25^\circ C$  per Fig. 2.
2. 8.3ms single half sine-wave, duty cycle = 4 pulses per minute maximum.
3.  $V_F < 3.5V$  for devices of  $V_{BR} < 200V$  and  $V_F < 5.0V$  for devices of  $V_{BR} > 201V$ .

## DEVICES FOR BIPOLAR APPLICATIONS

1. For Bidirectional use C or CA Suffix for types SMAJ5.0 thru SMAJ440.
2. Electrical characteristics apply in both directions.

RATING AND CHARACTERISTIC CURVES (SMAJ SERIES)

FIG.1-PEAK PULSE POWER DERATING CURVE

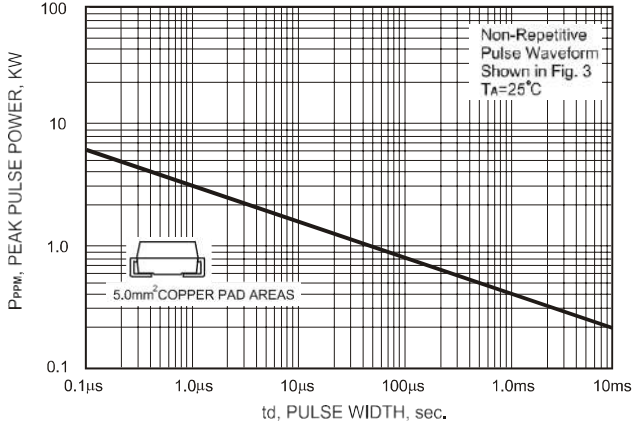


FIG.2-PULSE DERATING CURVE

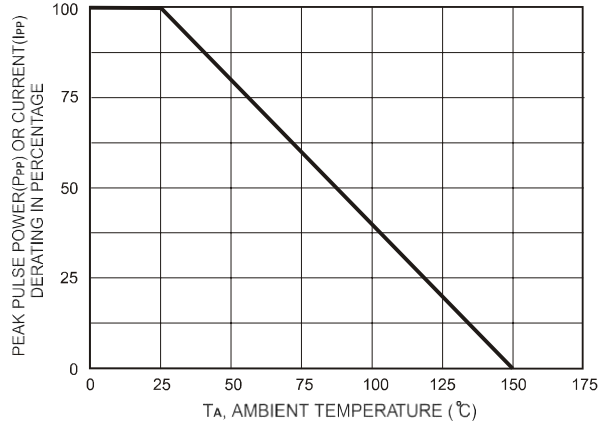


FIG.3-PULSE WAVE FORM

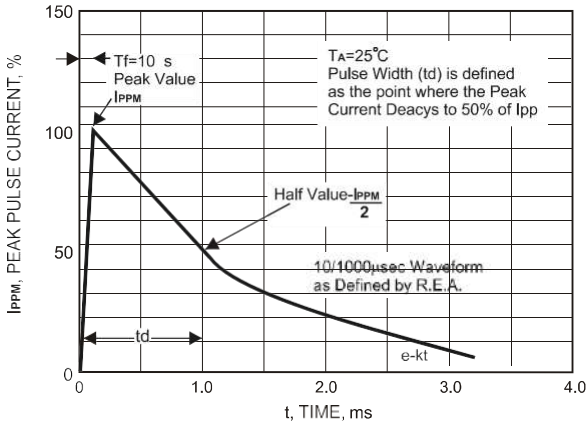


FIG.4-TYPICAL JUNCTION CAPACITANCE

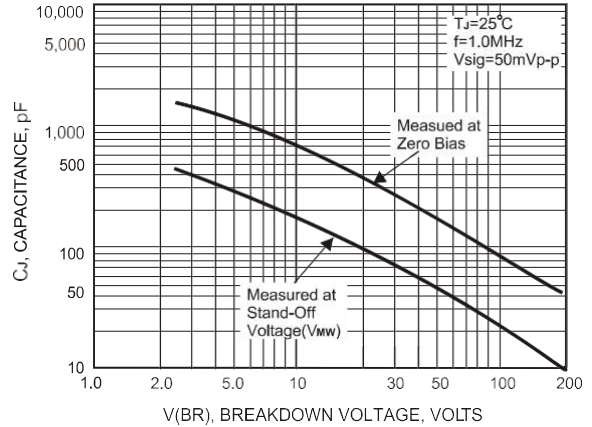


FIG.5-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

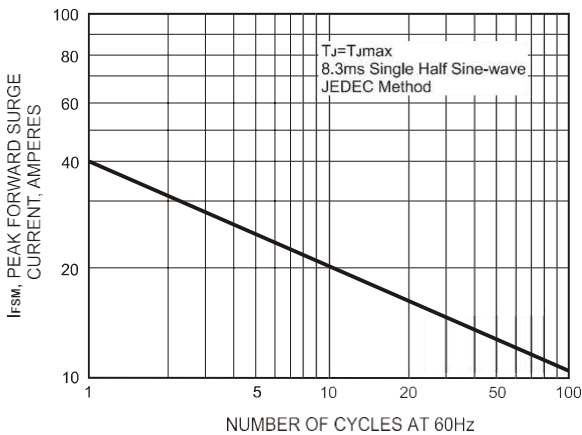
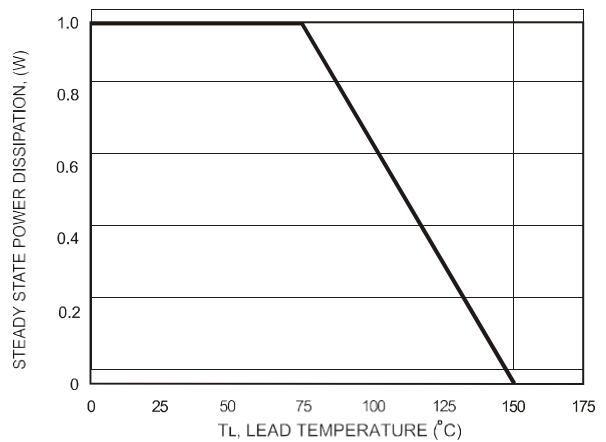


FIG.6-STEADY STATE POWER DERATING CURVE



**400 Watt Surface Mount TVS**

Part Number (Uni)	Part Number (Bi)	Device Marking Code		Reverse Standoff Voltage	Breakdown Voltage $V_{BR}$ @ $I_T$			Maximum Reverse Leakage @ VR	Maximum Peak Pulse Current @ $I_{pp}$	Maximum Clamping Voltage @ $I_{pp}$
		Uni	Bi		VR (V)	Min (V)	Max (V)			
SMAJ5.0	SMAJ5.0C	AD	ADP	5.0	6.40	7.30	10	800	41.67	9.6
SMAJ5.0A	SMAJ5.0CA	AE	AEP	5.0	6.40	7.00	10	800	43.48	9.2
SMAJ6.0	SMAJ6.0C	AF	AFP	6.0	6.67	8.15	10	800	35.09	11.4
SMAJ6.0A	SMAJ6.0CA	AG	AGP	6.0	6.67	7.37	10	800	38.83	10.3
SMAJ6.5	SMAJ6.5C	AH	AHP	6.5	7.22	8.82	10	500	32.52	12.3
SMAJ6.5A	SMAJ6.5CA	AK	AKP	6.5	7.22	7.98	10	500	35.71	11.2
SMAJ7.0	SMAJ7.0C	AL	ALP	7.0	7.78	9.51	10	200	30.08	13.3
SMAJ7.0A	SMAJ7.0CA	AM	AMP	7.0	7.78	8.60	10	200	33.33	12.0
SMAJ7.5	SMAJ7.5C	AN	ANP	7.5	8.33	10.20	1	100	27.97	14.3
SMAJ7.5A	SMAJ7.5CA	AP	APP	7.5	8.33	9.21	1	100	31.01	12.9
SMAJ8.0	SMAJ8.0C	AQ	AQP	8.0	8.89	10.90	1	50	26.67	15.0
SMAJ8.0A	SMAJ8.0CA	AR	ARP	8.0	8.89	9.83	1	50	29.41	13.6
SMAJ8.5	SMAJ8.5C	AS	ASP	8.5	9.44	11.50	1	10	25.16	15.9
SMAJ8.5A	SMAJ8.5CA	AT	ATP	8.5	9.44	10.40	1	10	27.78	14.4
SMAJ9.0	SMAJ9.0C	AU	AUP	9.0	10.00	12.20	1	5	23.67	16.9
SMAJ9.0A	SMAJ9.0CA	AV	AVP	9.0	10.00	11.10	1	5	25.97	15.4
SMAJ10	SMAJ10C	AW	AWP	10.0	11.10	13.60	1	5	21.28	18.8
SMAJ10A	SMAJ10CA	AX	AXP	10.0	11.10	12.30	1	5	23.53	17.0
SMAJ11	SMAJ11C	AY	AYP	11.0	12.20	14.90	1	5	19.90	20.1
SMAJ11A	SMAJ11CA	AZ	AZP	11.0	12.20	13.50	1	5	21.98	18.2
SMAJ12	SMAJ12C	BD	BDP	12.0	13.30	16.30	1	5	18.18	22.0
SMAJ12A	SMAJ12CA	BE	BEP	12.0	13.30	14.70	1	5	20.10	19.9
SMAJ13	SMAJ13C	BF	BFP	13.0	14.40	17.60	1	5	16.81	23.8
SMAJ13A	SMAJ13CA	BG	BGP	13.0	14.40	15.90	1	5	18.60	21.5
SMAJ14	SMAJ14C	BH	BHP	14.0	15.60	19.10	1	5	15.50	25.8
SMAJ14A	SMAJ14CA	BK	BKP	14.0	15.60	17.20	1	5	17.24	23.2
SMAJ15	SMAJ15C	BL	BLP	15.0	16.70	20.40	1	5	14.87	26.9
SMAJ15A	SMAJ15CA	BM	BMP	15.0	16.70	18.50	1	5	16.39	24.4
SMAJ16	SMAJ16C	BN	BNP	16.0	17.80	21.80	1	5	13.89	28.8
SMAJ16A	SMAJ16CA	BP	BPP	16.0	17.80	19.70	1	5	15.38	26.0
SMAJ17	SMAJ17C	BQ	BQP	17.0	18.90	23.10	1	5	13.11	30.5
SMAJ17A	SMAJ17CA	BR	BRP	17.0	18.90	20.90	1	5	14.49	27.6
SMAJ18	SMAJ18C	BS	BSP	18.0	20.00	24.40	1	5	12.42	32.2
SMAJ18A	SMAJ18CA	BT	BTP	18.0	20.00	22.10	1	5	13.70	29.2
SMAJ20	SMAJ20C	BU	BUP	20.0	22.20	27.10	1	5	11.76	35.8
SMAJ20A	SMAJ20CA	BV	BVP	20.0	22.20	24.50	1	5	13.00	32.4
SMAJ22	SMAJ22C	BW	BWP	22.0	24.40	29.80	1	5	10.15	39.4
SMAJ22A	SMAJ22CA	BX	BXP	22.0	24.40	26.90	1	5	11.27	35.5
SMAJ24	SMAJ24C	BY	BYP	24.0	26.70	32.60	1	5	9.30	43.0
SMAJ24A	SMAJ24CA	BZ	BZP	24.0	26.70	29.50	1	5	10.28	38.9
SMAJ26	SMAJ26C	CD	CDP	26.0	28.90	35.30	1	5	8.58	46.6
SMAJ26A	SMAJ26CA	CE	CEP	26.0	28.90	31.90	1	5	9.50	42.1
SMAJ28	SMAJ28C	CF	CFP	28.0	31.10	38.00	1	5	8.00	50.0
SMAJ28A	SMAJ28CA	CG	CGP	28.0	31.10	34.40	1	5	8.81	45.4
SMAJ30	SMAJ30C	CH	CHP	30.0	33.30	40.70	1	5	7.48	53.5
SMAJ30A	SMAJ30CA	CK	CKP	30.0	33.30	36.80	1	5	8.26	48.4
SMAJ33	SMAJ33C	CL	CLP	33.0	36.70	44.90	1	5	6.78	59.0
SMAJ33A	SMAJ33CA	CM	CMP	33.0	36.70	40.60	1	5	7.50	53.3
SMAJ36	SMAJ36C	CN	CNP	36.0	40.00	48.90	1	5	6.22	64.3
SMAJ36A	SMAJ36CA	CP	CPP	36.0	40.00	44.20	1	5	6.88	58.1
SMAJ40	SMAJ40C	CQ	CQP	40.0	44.40	54.30	1	5	5.60	71.4
SMAJ40A	SMAJ40CA	CR	CRP	40.0	44.40	49.10	1	5	6.20	64.5

**400 Watt Surface Mount TVS**

Part Number (Uni)	Part Number (Bi)	Device Marking Code		Reverse Standoff Voltage	Breakdown Voltage V <sub>BR</sub> @ I <sub>T</sub>			Maximum Reverse Leakage @ VR	Maximum Peak Pulse Current	Maximum Clamping Voltage @ I <sub>pp</sub>
		Uni	Bi		VR (V)	Min (V)	Max (V)			
SMAJ43	SMAJ43C	CS	CSP	43.0	47.80	58.40	1	5	5.22	76.7
SMAJ43A	SMAJ43CA	CT	CTP	43.0	47.80	52.80	1	5	5.76	69.4
SMAJ45	SMAJ45C	CU	CUP	45.0	50.00	61.10	1	5	4.98	80.3
SMAJ45A	SMAJ45CA	CV	CVP	45.0	50.00	55.30	1	5	5.50	72.7
SMAJ48	SMAJ48C	CW	CWP	48.0	53.30	65.10	1	5	4.68	85.5
SMAJ48A	SMAJ48CA	CX	CXP	48.0	53.30	58.90	1	5	5.17	77.4
SMAJ51	SMAJ51C	CY	CYP	51.0	56.70	69.30	1	5	4.39	91.1
SMAJ51A	SMAJ51CA	CZ	CZP	51.0	56.70	62.70	1	5	4.85	82.4
SMAJ54	SMAJ54C	RD	RDP	54.0	60.00	73.30	1	5	4.15	96.3
SMAJ54A	SMAJ54CA	RE	REP	54.0	60.00	66.30	1	5	4.59	87.1
SMAJ58	SMAJ58C	RF	RFP	58.0	64.40	78.70	1	5	3.88	103.0
SMAJ58A	SMAJ58CA	RG	RGP	58.0	64.40	71.20	1	5	4.27	93.6
SMAJ60	SMAJ60C	RH	RHP	60.0	66.70	81.50	1	5	3.74	107.0
SMAJ60A	SMAJ60CA	RK	RKP	60.0	66.70	73.70	1	5	4.13	96.8
SMAJ64	SMAJ64C	RL	RLP	64.0	71.10	86.40	1	5	3.51	114.0
SMAJ64A	SMAJ64CA	RM	RMP	64.0	71.10	78.60	1	5	3.88	103.0
SMAJ70	SMAJ70C	RN	RNP	70.0	77.80	95.10	1	5	3.20	125.0
SMAJ70A	SMAJ70CA	RP	RPP	70.0	77.80	86.00	1	5	3.54	113.0
SMAJ75	SMAJ75C	RQ	RQP	75.0	83.30	102.00	1	5	2.99	134.0
SMAJ75A	SMAJ75CA	RR	RRP	75.0	83.30	92.10	1	5	3.31	121.0
SMAJ78	SMAJ78C	RS	RSP	78.0	86.70	106.00	1	5	2.88	139.0
SMAJ78A	SMAJ78CA	RT	RTP	78.0	86.70	95.80	1	5	3.17	126.0
SMAJ85	SMAJ85C	RU	RUP	85.0	94.40	115.00	1	5	2.65	151.0
SMAJ85A	SMAJ85CA	RV	RVP	85.0	94.40	104.00	1	5	2.92	137.0
SMAJ90	SMAJ90C	RW	RWP	90.0	100.00	122.00	1	5	2.50	160.0
SMAJ90A	SMAJ90CA	RX	RXP	90.0	100.00	111.00	1	5	2.74	146.0
SMAJ100	SMAJ100C	RY	RYP	100.0	111.00	136.00	1	5	2.23	179.0
SMAJ100A	SMAJ100CA	RZ	RZP	100.0	111.00	123.00	1	5	2.47	162.0
SMAJ110	SMAJ110C	SD	SDP	110.0	122.00	149.00	1	5	2.04	196.0
SMAJ110A	SMAJ110CA	SE	SEP	110.0	122.00	135.00	1	5	2.26	177.0
SMAJ120	SMAJ120C	SF	SFP	120.0	133.00	163.00	1	5	1.87	214.0
SMAJ120A	SMAJ120CA	SG	SGP	120.0	133.00	147.00	1	5	2.07	193.0
SMAJ130	SMAJ130C	SH	SHP	130.0	144.00	176.00	1	5	1.73	231.0
SMAJ130A	SMAJ130CA	SK	SKP	130.0	144.00	159.00	1	5	1.91	209.0
SMAJ150	SMAJ150C	SL	SLP	150.0	167.00	204.00	1	5	1.49	268.0
SMAJ150A	SMAJ150CA	SM	SMP	150.0	167.00	185.00	1	5	1.65	243.0
SMAJ160	SMAJ160C	SN	SNP	160.0	178.00	218.00	1	5	1.39	287.0
SMAJ160A	SMAJ160CA	SP	SPP	160.0	178.00	197.00	1	5	1.54	259.0
SMAJ170	SMAJ170C	SQ	SQP	170.0	189.00	231.00	1	5	1.32	304.0
SMAJ170A	SMAJ170CA	SR	SRP	170.0	189.00	209.00	1	5	1.45	275.0
SMAJ180	SMAJ180C	SS	SSP	180.0	200.00	244.00	1	5	1.24	322.2
SMAJ180A	SMAJ180CA	ST	STP	180.0	200.00	220.00	1	5	1.37	291.6
SMAJ190	SMAJ190C	SU	SUP	190.0	211.00	258.00	1	5	1.18	340.1
SMAJ190A	SMAJ190CA	SV	SVP	190.0	211.00	232.00	1	5	1.30	307.8
SMAJ200A	SMAJ200CA	SW	SWP	200.0	224.00	247.00	1	5	1.23	324.0
SMAJ220A	SMAJ220CA	SX	SXP	220.0	246.00	272.00	1	5	1.12	356.0
SMAJ250A	SMAJ250CA	SZ	SZP	250.0	279.00	309.00	1	5	0.99	405.0
SMAJ300A	SMAJ300CA	TE	TEP	300.0	335.00	371.00	1	5	0.82	486.0
SMAJ350A	SMAJ350CA	TG	TGP	350.0	391.00	432.00	1	5	0.71	567.0
SMAJ400A	SMAJ400CA	TK	TKP	400.0	447.00	494.00	1	5	0.62	648.0
SMAJ440A	SMAJ440CA	TM	TMP	440.0	492.00	543.00	1	5	0.56	713.0