



# THE DATASHEET OF SMAJ20CATR



## SMAJ SERIES SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

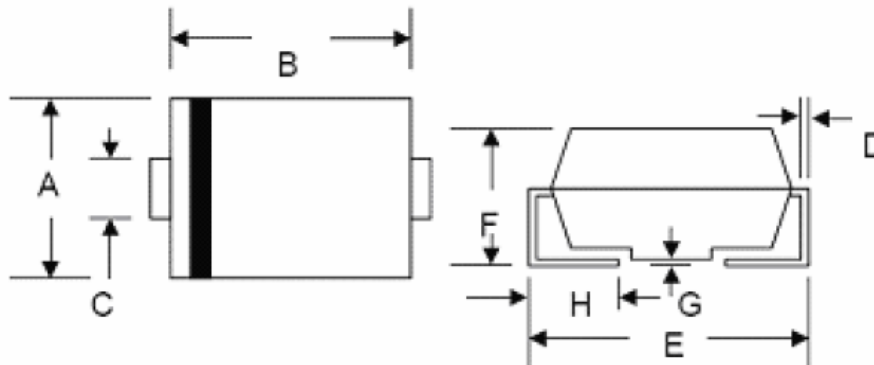
**Features:**

- Glass Passivated Die Construction
- 400W Peak Pulse Power Dissipation
- 5.0V- 170V Standoff Voltage
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- Plastic Case Material has UL Flammability Classification Rating 94V-O
- This is a Pb – Free Device
- All SMC Parts are Traceable to the Wafer Lot
- Additional testing can be offered upon request

**Mechanical Data:**

- Case: JEDEC DO-214AC Low Profile Molded Plastic
- Terminals: Solder Plated , Solderable per MIL-STD 750, Method 2026
- Polarity: Cathode Band or Cathode Notch
- Weight:0.064 grams(approx.)

**Mechanical Dimensions: In Inches (mm)**



SMA/DO-214AC				
Dim.	Min.	Max.	Min.	Max.
A	2.50	2.90	0.098	0.114
B	4.00	4.60	0.157	0.181
C	1.40	1.60	0.055	0.063
D	0.152	0.305	0.006	0.012
E	4.80	5.28	0.189	0.208
F	2.00	2.44	0.079	0.096
G	0.051	0.203	0.002	0.008
H	0.76	1.52	0.030	0.060
	In mm		In inch	

**SMA**

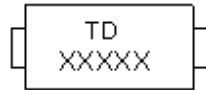
- China - Germany - Korea - Singapore - United States •
- <http://www.smc-diodes.com> - [sales@smc-diodes.com](mailto:sales@smc-diodes.com) •

**Marking Diagram:**

Where XXXXX is YYWWL



SMAJ5.0



SMAJ5.0C

HD/TD = Part Name  
YY = Year  
WW = Week  
L = Lot Number

**Cautions:** Molding resin  
Epoxy resin UL:94V-0

**Ordering Information**

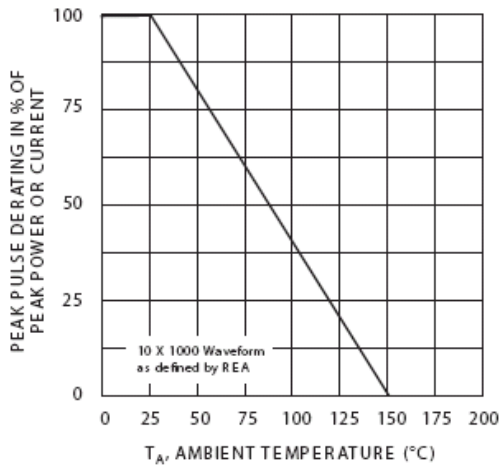
Device	Package	Shipping
SMAJ SERIES	SMA (Pb-Free)	5000pcs / reel

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification.

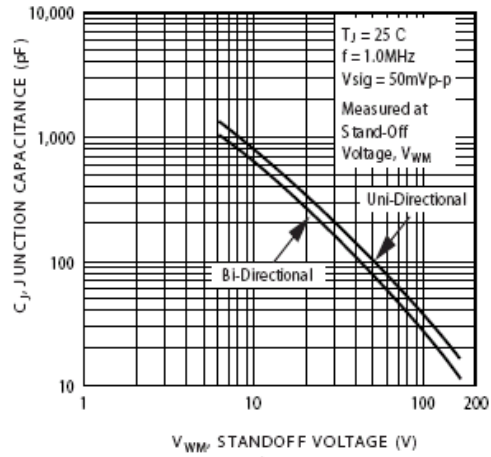
**Maximum Ratings and Electrical Characteristics @ $T_A=25^\circ\text{C}$  unless otherwise specified**

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at $T_A=25^\circ\text{C}$ by 10x1000 $\mu\text{s}$ Waveform (Fig.1)(Note 1, 2, 5)	$P_{PPM}$	400	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave ( Fig.5),(Note 3)	$I_{FSM}$	40	A
Peak Pulse Current on 10x1000 $\mu\text{s}$ Waveform(Fig.2)(Note 1)	$I_{PPM}$	See Table 1	A
Steady State Power Dissipation(Note 4)	$P_{M(AV)}$	1.0	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

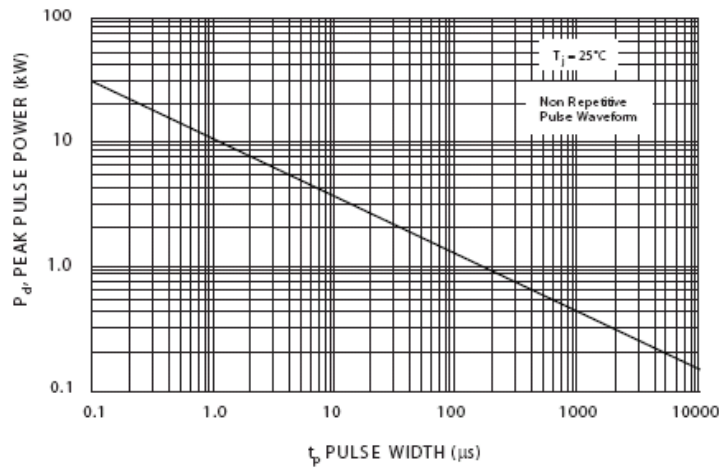
- Notes:**
1. Non-repetitive current pulse, per Fig. 3 and derated above  $T_A = 25^\circ\text{C}$  per Fig. 2.
  2. Mounted on 5.0mm<sup>2</sup> copper pads to each terminal.
  3. Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4pulses per minute maximum.
  4. Lead temperature at  $75^\circ\text{C}=T_L$
  5. Peak pulse power waveform is 10x1000 $\mu\text{s}$



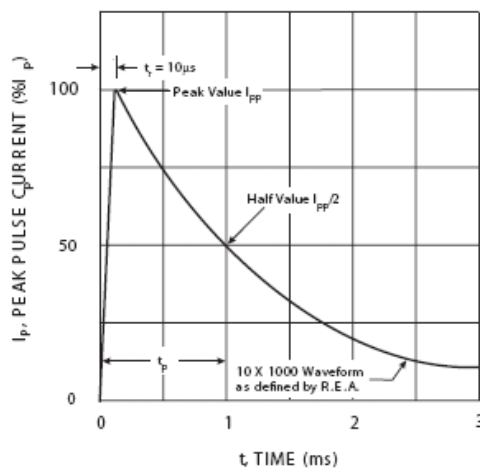
$T_A$ , AMBIENT TEMPERATURE (°C)  
 Fig. 1 Pulse Derating Curve



$V_{WM}$ , STANDOFF VOLTAGE (V)  
 Fig. 2 Typical Junction Capacitance



$t_p$  PULSE WIDTH ( $\mu s$ )  
 Fig. 3 Pulse Rating Curve



$t$  TIME (ms)  
 Fig. 4 Pulse Waveform

**Technical Data**  
Data Sheet N0223, Rev. -

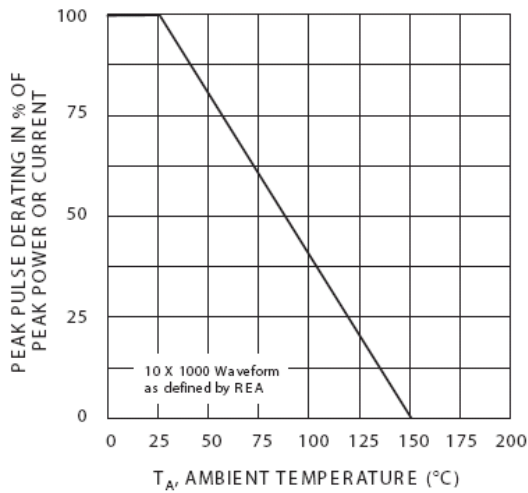


Fig. 1 Pulse Derating Curve

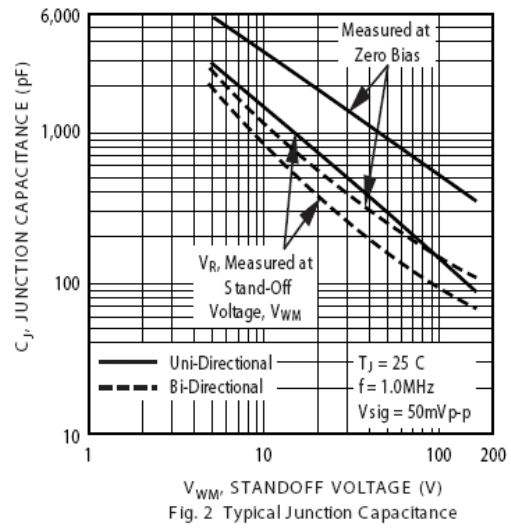


Fig. 2 Typical Junction Capacitance

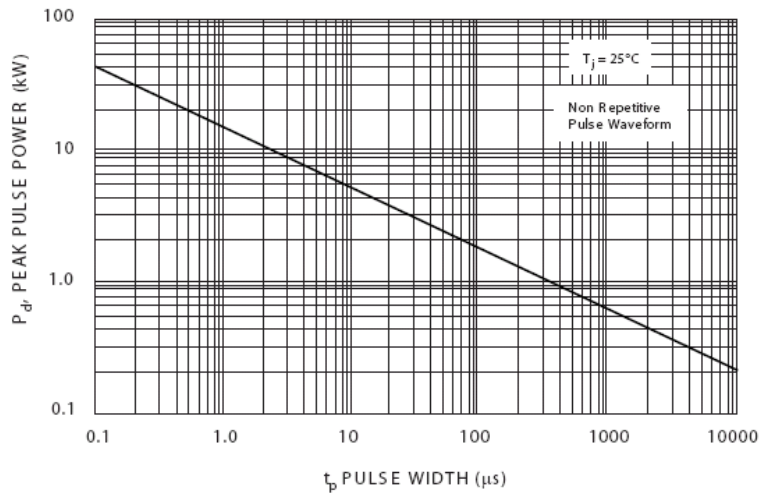


Fig. 3 Pulse Rating Curve

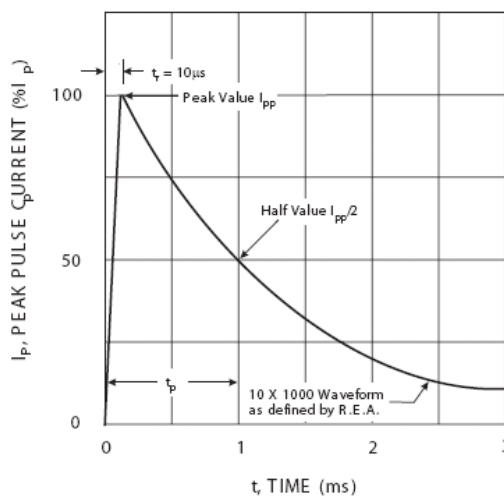


Fig. 4 Pulse Waveform



**SMAJ SERIES**  
400W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

Technical Data  
Data Sheet N0223, Rev. -

*Green Products*

**UNI-DIRECTIONAL 400 WATT SURFACE MOUNT TVS**

UNI-DIRECTIONAL PART NO.	DEVICE MARKING CODE	REVERSE STAND-OFF VOLTAGE VRWM (V)	BREAKDOWN VOLTAGE VBR (V) MIN. @1T	BREAKDOWN VOLTAGE VBR (V) MAX. @1T	TEST CURRENT IT (mA)	MAXIMUM CLAMPING VOLTAGE @Ipp Vc (V)	PEAK PULSE CURRENT Ipp (A)	REVERSE LEAKAGE @VRWM IR (uA)
SMAJ5.0	HD	5.00	8.40	7.82	10	9.8	41.8	800
SMAJ5.0A	HE	5.00	8.40	7.07	10	9.2	43.5	800
SMAJ6.0	HF	8.00	8.87	8.15	10	11.4	35.1	800
SMAJ6.0A	HG	8.00	8.87	7.37	10	10.3	38.8	800
SMAJ6.5	HH	8.50	7.22	8.82	10	12.3	32.5	500
SMAJ6.5A	HK	8.50	7.22	7.98	10	11.2	35.7	500
SMAJ7.0	HL	7.00	7.78	9.51	10	13.3	30.1	200
SMAJ7.0A	HM	7.00	7.78	8.60	10	12.0	33.3	200
SMAJ7.5	HN	7.50	8.33	10.18	1	14.3	28.0	100
SMAJ7.5A	HP	7.50	8.33	9.21	1	12.9	31.0	100
SMAJ8.0	HQ	8.00	8.99	10.99	1	15.0	26.5	50
SMAJ8.0A	HR	8.00	8.99	9.94	1	13.8	29.4	50
SMAJ8.5	HS	8.50	9.44	11.54	1	15.9	25.1	10
SMAJ8.5A	HT	8.50	9.44	10.43	1	14.4	27.7	10
SMAJ9.0	HU	9.00	10.00	12.22	1	16.9	23.8	5
SMAJ9.0A	HV	9.00	10.00	11.05	1	15.4	26.0	5
SMAJ10	HW	10.00	11.10	13.57	1	18.8	21.2	5
SMAJ10A	HX	10.00	11.10	12.27	1	17.0	23.5	5
SMAJ11	HY	11.00	12.20	14.91	1	20.1	20.0	5
SMAJ11A	HZ	11.00	12.20	13.48	1	18.2	22.0	5
SMAJ12	ID	12.00	13.30	16.28	1	22.0	18.1	5
SMAJ12A	IE	12.00	13.30	14.70	1	19.9	20.1	5
SMAJ13	IF	13.00	14.40	17.80	1	23.8	16.8	5
SMAJ13A	IG	13.00	14.40	15.92	1	21.5	18.8	5
SMAJ14	IH	14.00	15.80	19.07	1	25.8	15.5	5
SMAJ14A	IK	14.00	15.80	17.24	1	23.2	17.2	5
SMAJ15	IL	15.00	16.70	20.41	1	28.9	14.8	5
SMAJ15A	IM	15.00	16.70	18.48	1	24.4	16.4	5
SMAJ16	IN	16.00	17.80	21.78	1	28.8	13.8	5
SMAJ16A	IP	16.00	17.80	19.67	1	26.0	15.3	5
SMAJ17	IQ	17.00	18.90	23.10	1	30.5	13.1	5
SMAJ17A	IR	17.00	18.90	20.89	1	27.6	14.5	5
SMAJ18	IS	18.00	20.00	24.44	1	32.2	12.4	5
SMAJ18A	IT	18.00	20.00	22.11	1	29.2	13.7	5
SMAJ20	IU	20.00	22.20	27.13	1	35.8	11.1	5
SMAJ20A	IV	20.00	22.20	24.54	1	32.4	12.3	5
SMAJ22	IW	22.00	24.40	29.82	1	39.4	10.1	5
SMAJ22A	IX	22.00	24.40	26.97	1	35.5	11.2	5
SMAJ24	IY	24.00	26.70	32.63	1	43.0	9.3	5
SMAJ24A	IZ	24.00	26.70	29.51	1	38.9	10.3	5
SMAJ26	JD	26.00	28.90	35.32	1	46.6	8.6	5
SMAJ26A	JE	26.00	28.90	31.94	1	42.1	9.5	5
SMAJ28	JF	28.00	31.10	38.01	1	50.0	8.0	5
SMAJ28A	JG	28.00	31.10	34.37	1	45.4	8.8	5
SMAJ30	JH	30.00	33.30	40.70	1	53.5	7.5	5
SMAJ30A	JK	30.00	33.30	36.81	1	48.4	8.3	5
SMAJ33	JL	33.00	36.70	44.88	1	59.0	6.8	5
SMAJ33A	JM	33.00	36.70	40.58	1	53.3	7.5	5
SMAJ36	JN	36.00	40.00	48.89	1	64.3	6.2	5
SMAJ36A	JP	36.00	40.00	44.21	1	58.1	6.9	5
SMAJ40	JQ	40.00	44.40	54.27	1	71.4	5.8	5
SMAJ40A	JR	40.00	44.40	49.07	1	64.5	6.2	5
SMAJ43	JS	43.00	47.80	58.42	1	78.7	5.2	5
SMAJ43A	JT	43.00	47.80	52.83	1	69.4	5.7	5
SMAJ45	JU	45.00	50.00	61.11	1	80.3	5.0	5
SMAJ45A	JV	45.00	50.00	55.28	1	72.7	5.5	5
SMAJ48	JW	48.00	53.30	65.14	1	85.5	4.7	5
SMAJ48A	JX	48.00	53.30	58.91	1	77.4	5.2	5
SMAJ51	JY	51.00	58.70	69.30	1	91.1	4.4	5
SMAJ51A	JZ	51.00	58.70	62.67	1	82.4	4.9	5
SMAJ54	RD	54.00	60.00	73.33	1	98.3	4.2	5
SMAJ54A	RE	54.00	60.00	66.32	1	87.1	4.6	5
SMAJ58	RF	58.00	64.40	78.71	1	103.0	3.9	5
SMAJ58A	RG	58.00	64.40	71.18	1	93.6	4.3	5
SMAJ60	RH	60.00	68.70	81.52	1	107.0	3.7	5
SMAJ60A	RK	60.00	68.70	73.72	1	98.8	4.1	5
SMAJ64	RL	64.00	71.10	86.90	1	114.0	3.5	5
SMAJ64A	RM	64.00	71.10	78.58	1	103.0	3.9	5
SMAJ70	RN	70.00	77.80	95.09	1	125.0	3.2	5
SMAJ70A	RO	70.00	77.80	85.99	1	113.0	3.5	5
SMAJ75	RQ	75.00	83.30	101.81	1	134.0	3.0	5
SMAJ75A	RR	75.00	83.30	92.07	1	121.0	3.3	5
SMAJ78	RS	78.00	88.70	105.97	1	139.0	2.9	5
SMAJ78A	RT	78.00	88.70	95.83	1	128.0	2.2	5
SMAJ85	RU	85.00	94.40	115.38	1	151.0	2.8	5
SMAJ85A	RV	85.00	94.40	104.34	1	137.0	2.9	5
SMAJ90	RW	90.00	100.00	122.22	1	160.0	2.5	5
SMAJ90A	RX	90.00	100.00	110.53	1	148.0	2.7	5
SMAJ100	RY	100.00	111.00	135.67	1	179.0	2.2	5
SMAJ100A	RZ	100.00	111.00	122.68	1	162.0	2.5	5
SMAJ110	SD	110.00	122.00	149.11	1	196.0	2.0	5
SMAJ110A	SE	110.00	122.00	134.84	1	177.0	2.3	5
SMAJ120	SF	120.00	133.00	162.56	1	214.0	1.9	5
SMAJ120A	SG	120.00	133.00	147.00	1	193.0	2.0	5
SMAJ130	SH	130.00	144.00	178.00	1	231.0	1.7	5
SMAJ130A	SK	130.00	144.00	159.16	1	209.0	1.9	5
SMAJ150	SL	150.00	167.00	204.11	1	269.0	1.5	5
SMAJ150A	SM	150.00	167.00	184.58	1	243.0	1.6	5
SMAJ160	SN	160.00	178.00	217.58	1	287.0	1.4	5
SMAJ160A	SP	160.00	178.00	198.74	1	259.0	1.5	5
SMAJ170	SQ	170.00	189.00	231.00	1	304.0	1.3	5
SMAJ170A	SR	170.00	189.00	208.89	1	275.0	1.4	5

"C" Suffix Designates Bi-directional Devices  
 "A" Suffix Designates 5% Tolerance Devices  
 No Suffix Designates 10% Tolerance Devices

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**SMAJ SERIES**  
400W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

Technical Data  
Data Sheet N0223, Rev. -

*Green Products*

**BI-DIRECTIONAL 400 WATT SURFACE MOUNT TVS**

BI-DIRECTIONAL PART NO.	DEVICE MARKING CODE	REVERSE STAND-OFF VOLTAGE VRWM (V)	BREAKDOWN VOLTAGE VBR (V) MIN. @1T	BREAKDOWN VOLTAGE VBR (V) MAX. @1T	TEST CURRENT IT (mA)	MAXIMUM CLAMPING VOLTAGE @Ipp Vc (V)	PEAK PULSE CURRENT Ipp (A)	REVERSE LEAKAGE @VRWM IR (uA)
SMAJ50C	TD	5.00	6.40	7.82	10	9.8	41.8	1600
SMAJ50CA	TE	5.00	6.40	7.07	10	9.2	43.5	1600
SMAJ60C	TF	6.00	6.67	8.15	10	11.4	35.1	1600
SMAJ60CA	TG	6.00	6.67	7.37	10	10.3	38.8	1600
SMAJ65C	TH	6.50	7.22	8.82	10	12.3	32.5	1000
SMAJ65CA	TK	6.50	7.22	7.98	10	11.2	35.7	1000
SMAJ70C	TL	7.00	7.78	9.51	10	13.3	30.1	400
SMAJ70CA	TM	7.00	7.78	8.60	10	12.0	33.3	400
SMAJ75C	TN	7.50	8.33	10.18	1	14.3	28.0	200
SMAJ75CA	TP	7.50	8.33	9.21	1	12.9	31.0	200
SMAJ80C	TQ	8.00	8.99	10.99	1	15.0	26.5	100
SMAJ80CA	TR	8.00	8.99	9.94	1	13.6	29.4	100
SMAJ85C	TS	8.50	9.44	11.54	1	15.9	25.1	20
SMAJ85CA	TT	8.50	9.44	10.43	1	14.4	27.7	20
SMAJ90C	TU	9.00	10.00	12.22	1	18.9	23.6	10
SMAJ90CA	TV	9.00	10.00	11.05	1	15.4	26.0	10
SMAJ10C	TW	10.00	11.10	13.57	1	18.8	21.2	5
SMAJ10CA	TX	10.00	11.10	12.27	1	17.0	23.5	5
SMAJ11C	TY	11.00	12.20	14.91	1	20.1	20.0	5
SMAJ11CA	TZ	11.00	12.20	13.48	1	18.2	22.0	5
SMAJ12C	UD	12.00	13.30	16.28	1	22.0	18.1	5
SMAJ12CA	UE	12.00	13.30	14.70	1	19.9	20.1	5
SMAJ13C	UF	13.00	14.40	17.60	1	23.8	16.8	5
SMAJ13CA	UG	13.00	14.40	15.92	1	21.5	18.6	5
SMAJ14C	UH	14.00	15.60	19.07	1	25.8	15.5	5
SMAJ14CA	UK	14.00	15.60	17.24	1	23.2	17.2	5
SMAJ15C	UL	15.00	16.70	20.41	1	28.9	14.8	5
SMAJ15CA	UM	15.00	16.70	18.46	1	24.4	16.4	5
SMAJ16C	UN	16.00	17.80	21.76	1	28.8	13.8	5
SMAJ16CA	UP	16.00	17.80	19.67	1	26.0	15.3	5
SMAJ17C	UQ	17.00	18.90	23.10	1	30.5	13.1	5
SMAJ17CA	UR	17.00	18.90	20.89	1	27.6	14.5	5
SMAJ18C	US	18.00	20.00	24.44	1	32.2	12.4	5
SMAJ18CA	UT	18.00	20.00	22.11	1	29.2	13.7	5
SMAJ20C	UU	20.00	22.20	27.13	1	35.8	11.1	5
SMAJ20CA	UV	20.00	22.20	24.54	1	32.4	12.3	5
SMAJ22C	UW	22.00	24.40	29.62	1	39.4	10.1	5
SMAJ22CA	UX	22.00	24.40	26.97	1	35.5	11.2	5
SMAJ24C	UY	24.00	26.70	32.63	1	43.0	9.3	5
SMAJ24CA	UZ	24.00	26.70	29.51	1	38.9	10.3	5
SMAJ26C	VD	26.00	28.90	35.32	1	46.6	8.6	5
SMAJ26CA	VE	26.00	28.90	31.94	1	42.1	9.5	5
SMAJ28C	VF	28.00	31.10	38.01	1	50.0	8.0	5
SMAJ28CA	VG	28.00	31.10	34.37	1	45.4	8.8	5
SMAJ30C	VH	30.00	33.30	40.70	1	53.5	7.5	5
SMAJ30CA	VK	30.00	33.30	36.81	1	48.4	8.3	5
SMAJ33C	VL	33.00	36.70	44.86	1	59.0	6.8	5
SMAJ33CA	VM	33.00	36.70	40.56	1	53.3	7.5	5
SMAJ36C	VN	36.00	40.00	48.89	1	64.3	6.2	5
SMAJ36CA	VP	36.00	40.00	44.21	1	58.1	6.9	5
SMAJ40C	VQ	40.00	44.40	54.27	1	71.4	5.6	5
SMAJ40CA	VR	40.00	44.40	49.07	1	64.5	6.2	5
SMAJ43C	VS	43.00	47.80	58.42	1	78.7	5.2	5
SMAJ43CA	VT	43.00	47.80	52.83	1	69.4	5.7	5
SMAJ45C	VU	45.00	50.00	61.11	1	80.3	5.0	5
SMAJ45CA	VV	45.00	50.00	55.28	1	72.7	5.5	5
SMAJ48C	VW	48.00	53.30	65.14	1	85.5	4.7	5
SMAJ48CA	VX	48.00	53.30	59.91	1	77.4	5.2	5
SMAJ51C	VY	51.00	56.70	69.30	1	91.1	4.4	5
SMAJ51CA	VZ	51.00	56.70	62.67	1	82.4	4.9	5
SMAJ54C	WD	54.00	60.00	73.33	1	96.3	4.2	5
SMAJ54CA	WE	54.00	60.00	66.32	1	87.1	4.6	5
SMAJ58C	WF	58.00	64.40	78.71	1	103.0	3.9	5
SMAJ58CA	WG	58.00	64.40	71.18	1	93.6	4.3	5
SMAJ60C	WH	60.00	66.70	81.52	1	107.0	3.7	5
SMAJ60CA	WK	60.00	66.70	73.72	1	96.8	4.1	5
SMAJ64C	WL	64.00	71.10	86.90	1	114.0	3.5	5
SMAJ64CA	WM	64.00	71.10	78.58	1	103.0	3.9	5
SMAJ70C	WN	70.00	77.80	95.09	1	125.0	3.2	5
SMAJ70CA	WP	70.00	77.80	85.99	1	113.0	3.5	5
SMAJ75C	WQ	75.00	83.30	101.81	1	134.0	3.0	5
SMAJ75CA	WR	75.00	83.30	92.07	1	121.0	3.3	5
SMAJ78C	WS	78.00	86.70	105.97	1	139.0	2.9	5
SMAJ78CA	WT	78.00	86.70	95.83	1	128.0	2.2	5
SMAJ85C	WU	85.00	94.40	115.38	1	151.0	2.6	5
SMAJ85CA	WV	85.00	94.40	104.34	1	137.0	2.9	5
SMAJ90C	WW	90.00	100.00	122.22	1	160.0	2.5	5
SMAJ90CA	WX	90.00	100.00	110.53	1	148.0	2.7	5
SMAJ100C	WY	100.00	111.00	135.67	1	179.0	2.2	5
SMAJ100CA	WZ	100.00	111.00	122.68	1	162.0	2.5	5
SMAJ110C	XD	110.00	122.00	149.11	1	196.0	2.0	5
SMAJ110CA	XE	110.00	122.00	134.84	1	177.0	2.3	5
SMAJ120C	XF	120.00	133.00	162.56	1	214.0	1.9	5
SMAJ120CA	XG	120.00	133.00	147.00	1	193.0	2.0	5
SMAJ130C	XH	130.00	144.00	176.00	1	231.0	1.7	5
SMAJ130CA	XK	130.00	144.00	159.16	1	209.0	1.9	5
SMAJ150C	XL	150.00	167.00	204.11	1	269.0	1.5	5
SMAJ150CA	XM	150.00	167.00	184.58	1	243.0	1.6	5
SMAJ160C	XN	160.00	178.00	217.56	1	287.0	1.4	5
SMAJ160CA	XP	160.00	178.00	196.74	1	259.0	1.5	5
SMAJ170C	XG	170.00	189.00	231.00	1	304.0	1.3	5
SMAJ170CA	XR	170.00	189.00	208.89	1	275.0	1.4	5

"C" Suffix Designates Bi-directional Devices

"A" Suffix Designates 5% Tolerance Devices

No Suffix Designates 10% Tolerance Devices

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