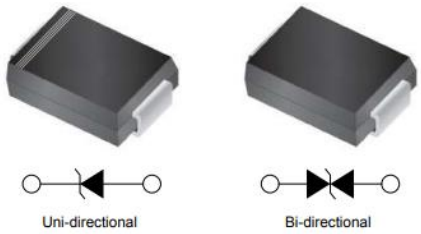
Transient Voltage Suppression Diodes: SMAJ Series
SMD Type 400 W

■ Features

1. Glass passivated chip
2. 400W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycle): 0.01%
3. Excellent clamping capability
4. Very fast response time
5. Low clamping voltage
6. Low leakage current
7. Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C
8. JESD22-A114-B ESD Voltage: HBM 15KV
9. JEDEC EIA/JESD22-C101F ESD Voltage: CDM 500V
10. JEDEC EIA/JESD22-A115 ESD Voltage: MM 400V
11. ESD-immunity acc. IEC 61000-4-2 ±30kV(contact), ±30kV(air)
12. Halogen free and RoHS compliant



■ Recommended Applications

1. Computers
2. Telecom system
3. Industrial equipment
4. Consumer electronic applications
5. Other VCC bus and I/O interfaces

■ Mechanical Data

1. Case: Molded plastic, SMA / DO-214AC
2. Epoxy: UL 94V-0 rate flame retardant
3. Terminals: Solderable per MIL-STD-750, method 2026
4. Polarity: Color band denotes cathode end
5. Mounting Position: Any

■ Part Number Code

S	M	A	J	5	.	0	C	A	Y
1	2	3	4	5	6	7	8	9	10

Product Series	
SMAJ	THINKING Transient Voltage Suppression Diodes SMAJ Series

Reverse Stand off Voltage (V_{RWM})	
5.0	5V
70	70V
120	120V

Type Code	
AY	Uni-directional, 5% V_{BR} Voltage Tolerance
CAY	Bi-directional, 5% V_{BR} Voltage Tolerance

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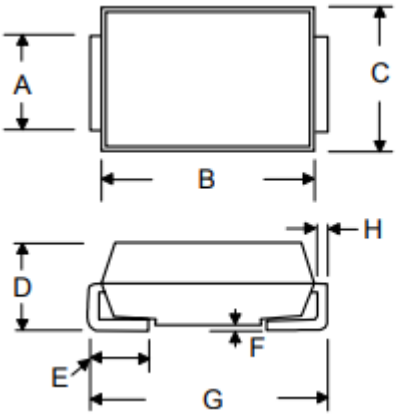
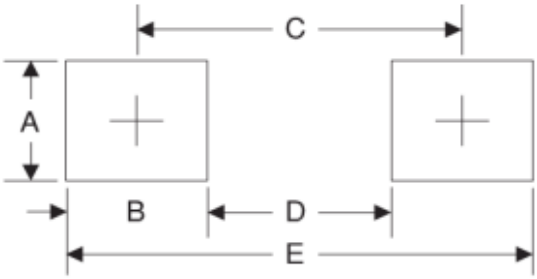
■ Structures and Dimensions



Symbol	Dimensions in millimeters	
	Min	Max
A	1.30	1.70
B	3.90	4.50
C	2.40	2.80
D	2.00	2.50
E	0.76	1.52
F	0.10	0.20
G	4.80	5.30
H	0.15	0.31



Symbol	Unit (mm)	Unit (inch)
A	1.68	0.066
B	1.52	0.060
C	3.90	0.154
D	2.41	0.095
E	5.45	0.215

■ Maximum Rating (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak power dissipation with a 10/1000μs waveform (Note 1,2)	P_{PPM}	400	W
Peak pulse current with 10/1000 μs waveform (Note 1)	I_{PPM}	See next table	A
Peak forward surge current, 8.3 ms single half sine-wave (Note 3)	I_{FSM}	40	A
Power dissipation on infinite heatsink at T_L=75°C	P_D	3.3	W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	120	°C/W
Typical thermal resistance junction to lead	$R_{\theta JL}$	30	°C/W
Operating junction and storage temperature range	T_J , T_{STG}	-55 to +150	°C

Note:

1. Non-repetitive current pulse, per Fig. 3 and derated above T_A=25°C per Fig. 2.
2. Mounted on 5.0 x 5.0mm copper pad to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

Transient Voltage Suppression Diodes: SMAJ Series

SMD Type 400 W

■ Electrical Characteristics (T_A=25℃ unless otherwise noted)

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage V_{BR} @ I_T		Test Current	Maximum Clamping Voltage V_C @ I_{pp}	Maximum Peak Pulse Current	Maximum Reverse Leakage I_R @V_{RWM}	Marking Code	
		V_{RWM} (V)	Min(V)	Max(V)	I_T(mA)	V_C(V)	I_{pp}(A)	I_R(μA)	Uni	Bi
SMAJ5.0AY	SMAJ5.0CAY	5	6.4	7	10	9.2	43.5	800	AE	WE
SMAJ6.0AY	SMAJ6.0CAY	6	6.7	7.4	10	10.3	38.8	800	AG	WG
SMAJ6.5AY	SMAJ6.5CAY	6.5	7.2	8	10	11.2	35.7	500	AK	WK
SMAJ7.0AY	SMAJ7.0CAY	7	7.8	8.6	10	12	33.3	200	AM	WM
SMAJ7.5AY	SMAJ7.5CAY	7.5	8.3	9.2	1	12.9	31	100	AP	WP
SMAJ8.0AY	SMAJ8.0CAY	8	8.9	9.8	1	13.6	29.4	50	AR	WR
SMAJ8.5AY	SMAJ8.5CAY	8.5	9.4	10.4	1	14.4	27.8	10	AT	WT
SMAJ9.0AY	SMAJ9.0CAY	9	10	11	1	15.4	26	5	AV	WV
SMAJ10AY	SMAJ10CAY	10	11.1	12.3	1	17	23.5	5	AX	WX
SMAJ11AY	SMAJ11CAY	11	12.2	13.5	1	18.2	22	1	AZ	WZ
SMAJ12AY	SMAJ12CAY	12	13.3	14.7	1	19.9	20.1	1	BE	XE
SMAJ13AY	SMAJ13CAY	13	14.4	15.9	1	21.5	18.6	1	BG	XG
SMAJ14AY	SMAJ14CAY	14	15.6	17.2	1	23.2	17.2	1	BK	XK
SMAJ15AY	SMAJ15CAY	15	16.7	18.5	1	24.4	16.4	1	BM	XM
SMAJ16AY	SMAJ16CAY	16	17.8	19.7	1	26	15.4	1	BP	XP
SMAJ17AY	SMAJ17CAY	17	18.9	20.9	1	27.6	14.5	1	BR	XR
SMAJ18AY	SMAJ18CAY	18	20	22.1	1	29.2	13.7	1	BT	XT
SMAJ19AY	SMAJ19CAY	19	21.1	23.3	1	30.8	13	1	BW	XW
SMAJ20AY	SMAJ20CAY	20	22.2	24.5	1	32.4	12.4	1	BV	XV
SMAJ22AY	SMAJ22CAY	22	24.4	26.9	1	35.5	11.3	1	BX	XX
SMAJ24AY	SMAJ24CAY	24	26.7	29.5	1	38.9	10.3	1	BZ	XZ
SMAJ26AY	SMAJ26CAY	26	28.9	31.9	1	42.1	9.5	1	CE	YE
SMAJ28AY	SMAJ28CAY	28	31.1	34.4	1	45.4	8.8	1	CG	YG
SMAJ30AY	SMAJ30CAY	30	33.3	36.8	1	48.4	8.3	1	CK	YK
SMAJ33AY	SMAJ33CAY	33	36.7	40.6	1	53.3	7.5	1	CM	YM
SMAJ36AY	SMAJ36CAY	36	40	44.2	1	58.1	6.9	1	CP	YP
SMAJ40AY	SMAJ40CAY	40	44.4	49.1	1	64.5	6.2	1	CR	YR
SMAJ43AY	SMAJ43CAY	43	47.8	52.8	1	69.4	5.8	1	CT	YT
SMAJ45AY	SMAJ45CAY	45	50	55.3	1	72.7	5.5	1	CV	YV
SMAJ48AY	SMAJ48CAY	48	53.3	58.9	1	77.4	5.2	1	CX	YX

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■ Electrical Characteristics (T_A=25℃ unless otherwise noted)

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage V_{BR} @ I_T		Test Current	Maximum Clamping Voltage V_C @ I_{pp}	Maximum Peak Pulse Current	Maximum Reverse Leakage I_R @V_{RWM}	Marking Code	
		V_{RWM} (V)	Min(V)	Max(V)	I_T(mA)	V_C(V)	I_{pp}(A)	I_R(μA)	Uni	Bi
SMAJ51AY	SMAJ51CAY	51	56.7	62.7	1	82.4	4.9	1	CZ	YZ
SMAJ54AY	SMAJ54CAY	54	60	66.3	1	87.1	4.6	1	RE	ZE
SMAJ58AY	SMAJ58CAY	58	64.4	71.2	1	93.6	4.3	1	RG	ZG
SMAJ60AY	SMAJ60CAY	60	66.7	73.7	1	96.8	4.1	1	RK	ZK
SMAJ64AY	SMAJ64CAY	64	71.1	78.6	1	103	3.9	1	RM	ZM
SMAJ70AY	SMAJ70CAY	70	77.8	86	1	113	3.5	1	RP	ZP
SMAJ75AY	SMAJ75CAY	75	83.3	92.1	1	121	3.3	1	RR	ZR
SMAJ78AY	SMAJ78CAY	78	86.7	95.8	1	126	3.2	1	RT	ZT
SMAJ80AY	SMAJ80CAY	80	88.8	97.6	1	129.6	3.1	1	RW	ZW
SMAJ85AY	SMAJ85CAY	85	94.4	104	1	137	2.9	1	RV	ZV
SMAJ90AY	SMAJ90CAY	90	100	111	1	146	2.7	1	RX	ZX
SMAJ100AY	SMAJ100CAY	100	111	123	1	162	2.5	1	RZ	ZZ
SMAJ110AY	SMAJ110CAY	110	122	135	1	177	2.3	1	SE	VE
SMAJ120AY	SMAJ120CAY	120	133	147	1	193	2.1	1	SG	VG
SMAJ130AY	SMAJ130CAY	130	144	159	1	209	1.9	1	SK	VK
SMAJ140AY	SMAJ140CAY	140	155	171	1	227	1.8	1	SW	VW
SMAJ150AY	SMAJ150CAY	150	167	185	1	243	1.7	1	SM	VM
SMAJ160AY	SMAJ160CAY	160	178	197	1	259	1.6	1	SP	VP
SMAJ170AY	SMAJ170CAY	170	189	209	1	275	1.5	1	SR	VR
SMAJ180AY	SMAJ180CAY	180	200	220	1	291	1.4	1	ST	VT
SMAJ190AY	SMAJ190CAY	190	211	232	1	308	1.3	1	SU	VU
SMAJ200AY	SMAJ200CAY	200	224	247	1	324	1.2	1	SV	VV
SMAJ220AY	SMAJ220CAY	220	246	272	1	356	1.1	1	SX	VX
SMAJ250AY	SMAJ250CAY	250	279	309	1	405	1	1	SZ	VZ
SMAJ300AY	SMAJ300CAY	300	335	371	1	486	0.8	1	TE	UE
SMAJ350AY	SMAJ350CAY	350	391	432	1	567	0.7	1	TG	UG
SMAJ400AY	SMAJ400CAY	400	447	494	1	648	0.6	1	TK	UK
SMAJ440AY	SMAJ440CAY	440	492	543	1	713	0.6	1	TM	UM

■ Typical Characteristics (T_A=25℃ unless otherwise noted)

Fig.1 - Peak Pulse Power Rating Curve

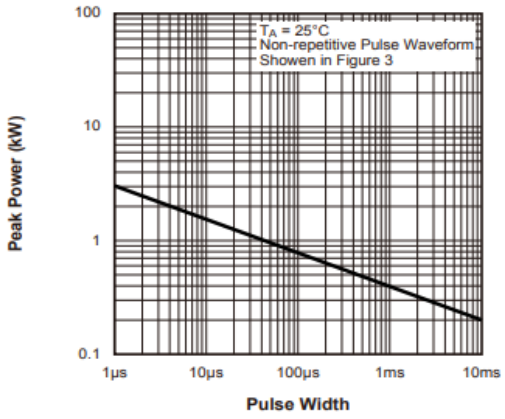


Fig.2 - Pulse Derating Curve

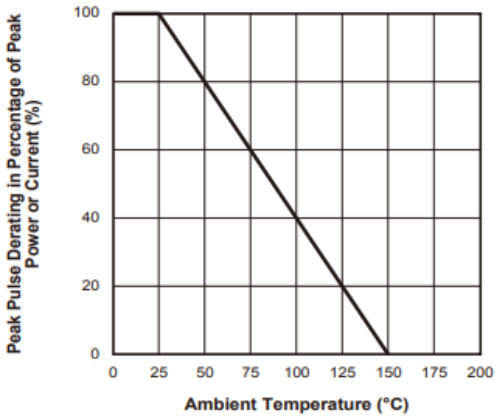


Fig.3 - Pulse Waveform

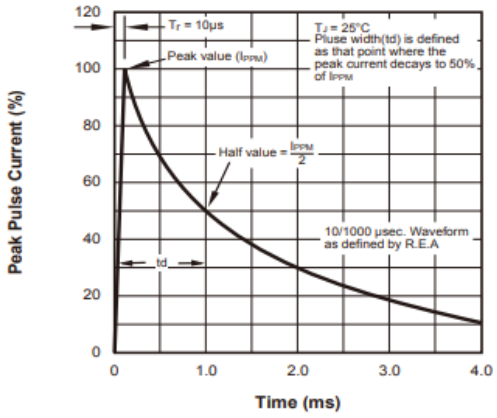
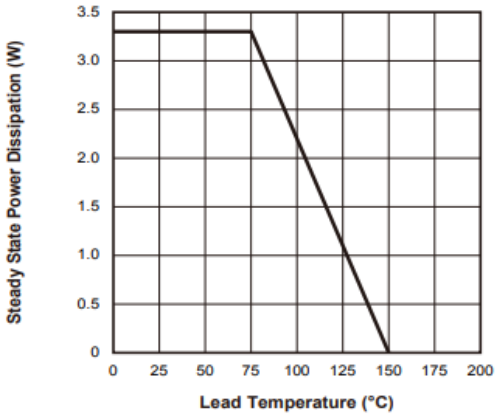
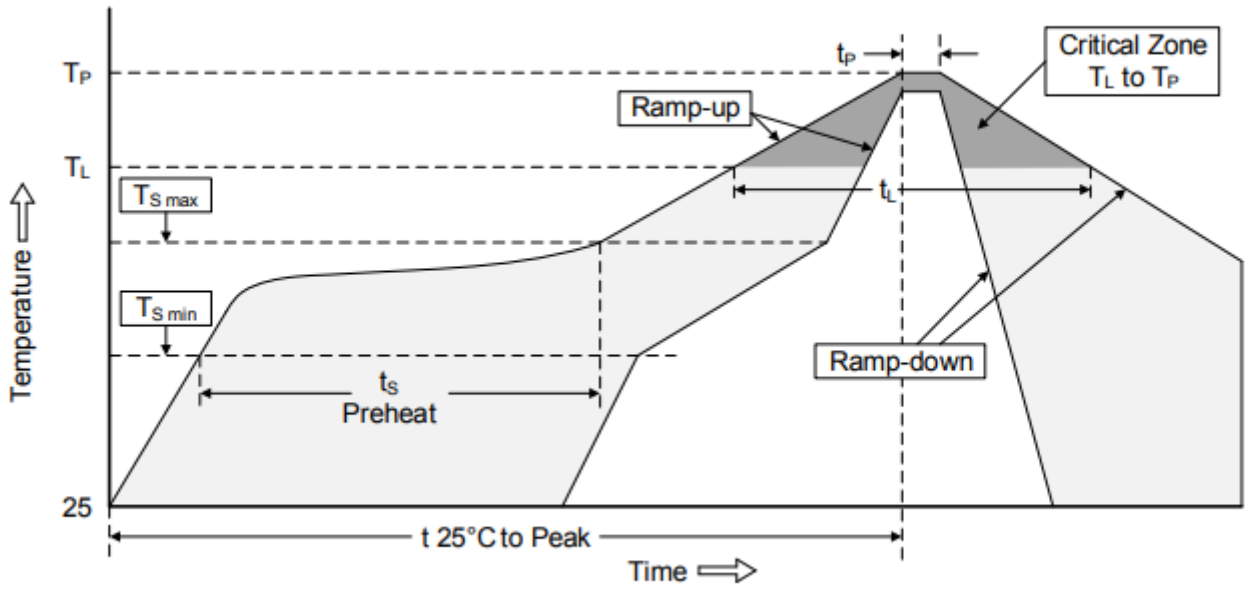


Fig.4 - Steady State Power Derating Curve



■ Soldering Recommendation

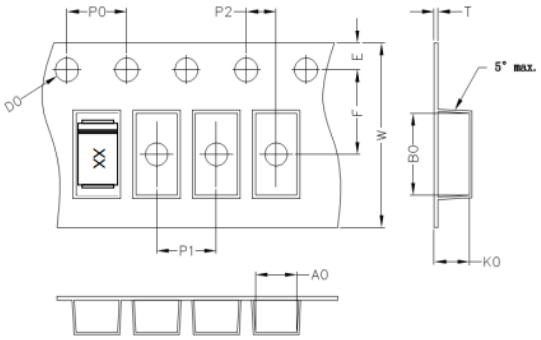
Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat -Temperature Min ($T_{S\,min}$) -Temperature Max ($T_{S\,max}$) -Time (min to max) (t_S)	 150°C 200°C 60-180 seconds
$T_{S\,max}$ to T_L -Ramp-up Rate	 3°C/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217°C 60-150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (t_P)	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

■ Packaging



A0	B0	K0	D0	E	F
2.80	5.30	2.36	1.55	1.75	5.50
P0	P1	P2	T	W	Tolerance
4.0	4.0	2.0	0.25	12	0.1

■ Quantity

106

Series Type	Packaging option	Base quantity	Packaging specification
SMAJ	Tape and reel	7500pcs / reel	EIA STD RS-481108

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■ Warehouse Storage Conditions of product

● Storage Condition:

1. Storage Temperature: -10℃~+40℃
2. Relative Humidity: ≦75%RH
3. Keep away from corrosive atmosphere and sunlight.

● Period of Storage: 1 year.