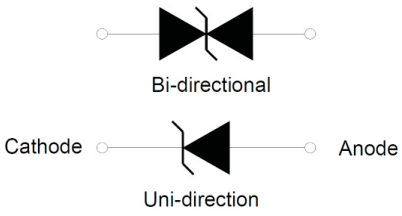
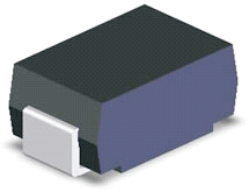
TVS Diode

KLS5-SMAJ SMAJ Series





SMA

Features

*400W peak pulse capability at 10/1000μs waveform

*IEC 61000-4-2(ESD) 15Kv(air), 8kV(contact)

*Quick response to surge voltage

*Excellent clamping capability

*Typical failure mode is short from over-specified voltage or current

*Solid-state silicon avalanche technology

Mechanical Characteristics

*Case: JEDEC DO-214AC. Moulded plastic over glass passivated junction

*Terminal: Solder plated, solderable per MIL-STD-750, Method 2026

*Polarity: Color band denoted positive end (cathode), except for bi-directional models

*Standard Packaging: 12mm tape (EIA STD RS-481)

*Weight: 0.002 ounces / 0.061 grams

Maximum Rating @ Ta=25℃ unless otherwise specified

Symbol	Parameter	Ratings	Units
P_{PK}	Peak Pulse Power Dissipation by10/1000μs Test Waveform	400	Watts
I_{FSM}	Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only	60	A
$P_{M(AV)}$	Power Dissipation on Infinite Heat Sink at TA=50℃	3.3	W
T_L	Lead Soldering Temperature	260(10sec.)	℃
T_J	Operating Temperature	-55 to +125	℃
T_{STG}	Storage Temperature	-55 to +150	℃

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Electrical Characteristics@ Ta=25℃ unless otherwise

Part No.		Marking		Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Maximum Clamping Voltage @IPP		Maximum Leakage Current
				V_{RWM}	V_{BR}	V_{BR}	I_T	V_C	I_{PP}	I_R@V_{RWM}
Uni	Bi	Uni	Bi	Volts	Volts	Volts	mA	Volts	A	μA
SMAJ5.0A	SMAJ5.0CA	HE	TE	5.0	6.40	7.00	10	9.2	43.5	800
SMAJ6.0A	SMAJ6.0CA	HG	TG	6.0	6.67	7.37	10	10.3	38.8	800
SMAJ6.5A	SMAJ6.5CA	HK	TK	6.5	7.22	7.98	10	11.2	35.7	500
SMAJ7.0A	SMAJ7.0CA	HM	TM	7.0	7.78	8.60	10	12.0	33.3	200
SMAJ7.5A	SMAJ7.5CA	HP	TP	7.5	8.33	9.21	1	12.9	31.0	100
SMAJ8.0A	SMAJ8.0CA	HR	TR	8.0	8.89	9.83	1	13.6	29.4	50
SMAJ8.5A	SMAJ8.5CA	HT	TT	8.5	9.44	10.40	1	14.4	27.8	20
SMAJ9.0A	SMAJ9.0CA	HV	TV	9.0	10.00	11.10	1	15.4	26.0	10
SMAJ10A	SMAJ10CA	HX	HX	10.0	11.10	12.30	1	17.0	23.5	5
SMAJ11A	SMAJ11CA	HZ	HZ	11.0	12.20	13.50	1	18.2	22.0	1
SMAJ12A	SMAJ12CA	IE	UE	12.0	13.30	14.70	1	19.9	20.1	1
SMAJ13A	SMAJ13CA	IG	UG	13.0	14.40	15.90	1	21.5	18.6	1
SMAJ14A	SMAJ14CA	IK	UK	14.0	15.60	17.20	1	23.2	17.2	1
SMAJ15A	SMAJ15CA	IM	UM	15.0	16.70	18.50	1	24.4	16.4	1
SMAJ16A	SMAJ16CA	IP	UP	16.0	17.80	19.70	1	26.0	15.4	1
SMAJ17A	SMAJ17CA	IR	UR	17.0	18.90	20.90	1	27.6	14.5	1
SMAJ18A	SMAJ18CA	IT	UT	18.0	20.00	22.10	1	29.2	13.7	1
SMAJ20A	SMAJ20CA	IV	UV	20.0	22.20	24.50	1	32.4	12.3	1
SMAJ22A	SMAJ22CA	IX	UX	22.0	24.40	26.90	1	35.5	11.3	1
SMAJ24A	SMAJ24CA	IZ	UZ	24.0	26.70	29.50	1	38.9	10.3	1
SMAJ26A	SMAJ26CA	JE	VE	26.0	28.90	31.90	1	42.1	9.5	1
SMAJ28A	SMAJ28CA	JG	VG	28.0	31.10	34.40	1	45.4	8.8	1
SMAJ30A	SMAJ30CA	JK	VK	30.0	33.30	36.80	1	48.4	8.3	1
SMAJ33A	SMAJ33CA	JM	VM	33.0	36.70	40.60	1	53.3	7.5	1
SMAJ36A	SMAJ36CA	JP	VP	36.0	40.00	44.20	1	58.1	6.9	1
SMAJ40A	SMAJ40CA	JR	VR	40.0	44.40	49.10	1	64.5	6.2	1
SMAJ43A	SMAJ43CA	JT	VT	43.0	47.80	52.80	1	69.4	5.8	1
SMAJ45A	SMAJ45CA	JV	VV	45.0	50.00	55.30	1	72.7	5.5	1
SMAJ48A	SMAJ48CA	JX	VX	48.0	53.30	58.90	1	77.4	5.2	1
SMAJ51A	SMAJ51CA	JZ	VZ	51.0	56.70	62.70	1	82.4	4.9	1
SMAJ54A	SMAJ54CA	RE	WE	54.0	60.00	66.30	1	87.1	4.6	1
SMAJ58A	SMAJ58CA	RG	WG	58.0	64.40	71.20	1	93.6	4.3	1
SMAJ60A	SMAJ60CA	RK	WK	60.0	66.70	73.70	1	96.8	4.1	1
SMAJ64A	SMAJ64CA	RM	WM	64.0	71.10	78.60	1	103.0	3.9	1

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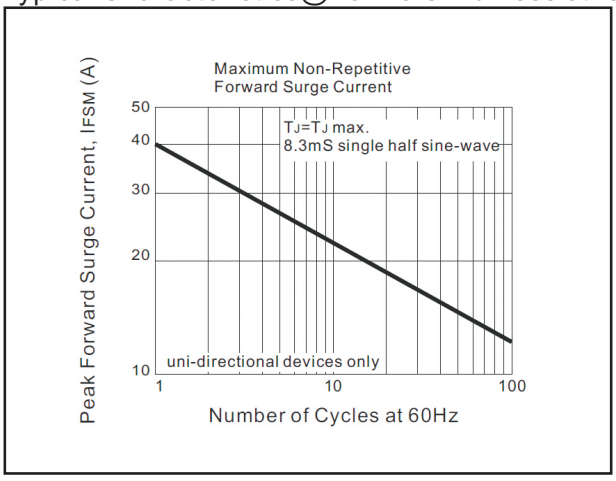
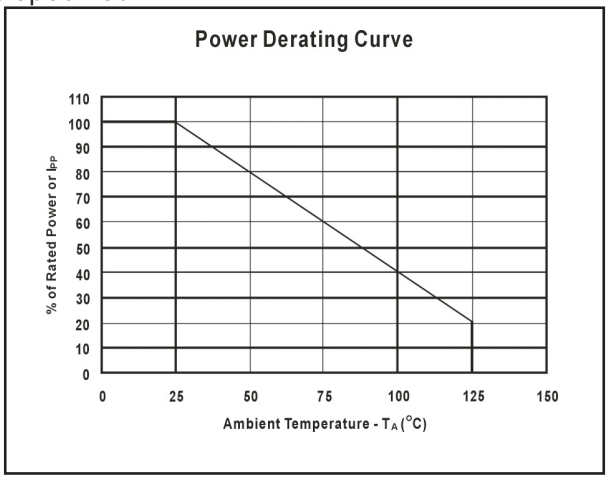
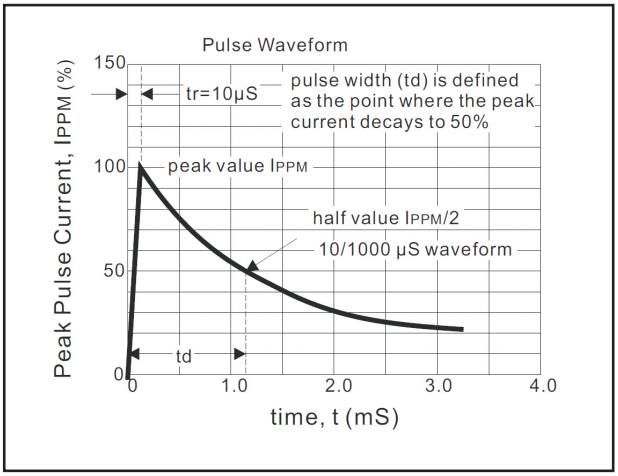
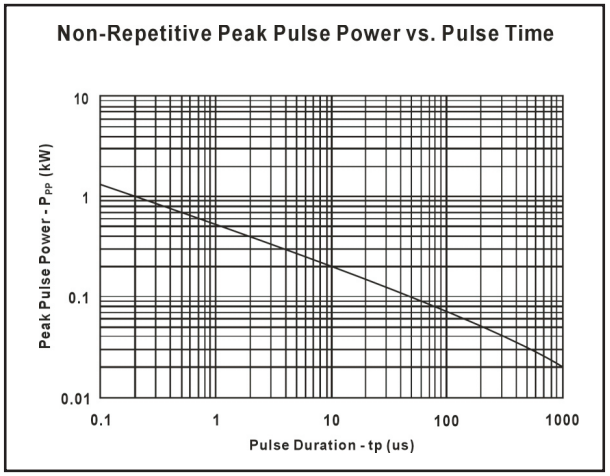
SMAJ70A	SMAJ70CA	RP	WP	70.0	77.80	86.00	1	113.0	3.5	1
SMAJ75A	SMAJ75CA	RR	WR	75.0	83.30	92.10	1	121.0	3.3	1
SMAJ78A	SMAJ78CA	RT	WT	78.0	86.70	95.80	1	126.0	3.2	1
SMAJ85A	SMAJ85CA	RV	WV	85.0	94.40	104.00	1	137.0	2.9	1
SMAJ90A	SMAJ90CA	RX	WX	90.0	100.00	111.00	1	146.0	2.7	1
SMAJ100A	SMAJ100CA	RZ	WZ	100.0	111.00	123.00	1	162.0	2.5	1
SMAJ110A	SMAJ110CA	SE	XE	110.0	122.00	135.00	1	177.0	2.3	1
SMAJ120A	SMAJ120CA	SG	XG	120.0	133.00	147.00	1	193.0	2.1	1
SMAJ130A	SMAJ130CA	SK	XK	130.0	144.00	159.00	1	209.0	1.9	1
SMAJ150A	SMAJ150CA	SM	XM	150.0	167.00	185.00	1	243.0	1.6	1
SMAJ160A	SMAJ160CA	SP	XP	160.0	178.00	197.00	1	259.0	1.5	1
SMAJ170A	SMAJ170CA	SR	XR	170.0	189.00	209.00	1	275.0	1.5	1
SMAJ180A	SMAJ180CA	ST	YT	180.0	201.00	222.00	1	292.0	1.4	1
SMAJ200A	SMAJ200CA	SZ	YZ	200.0	224.00	247.00	1	324.0	1.2	1
SMAJ220A	SMAJ220CA	GE	ZE	220.0	246.00	272.00	1	356.0	1.1	1

Typical Characteristics@ Ta=25℃ unless otherwise specified









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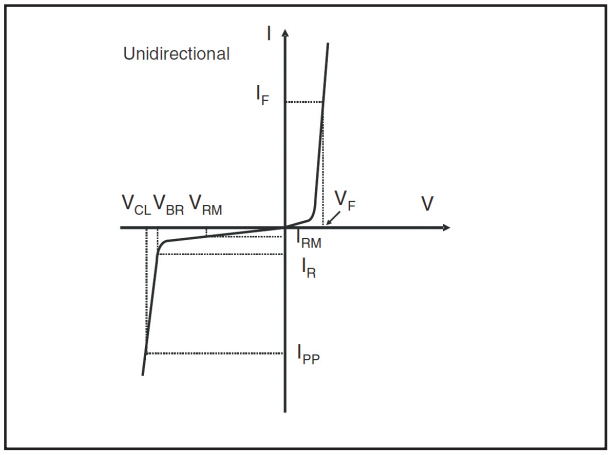
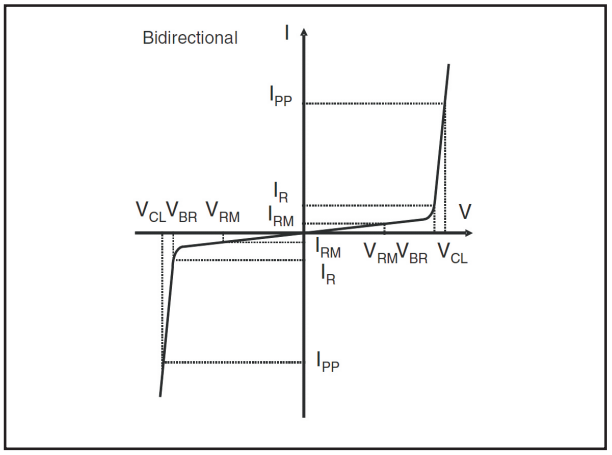
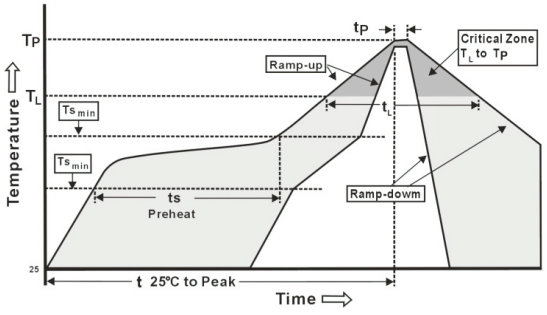
I-V Curve Characteristics



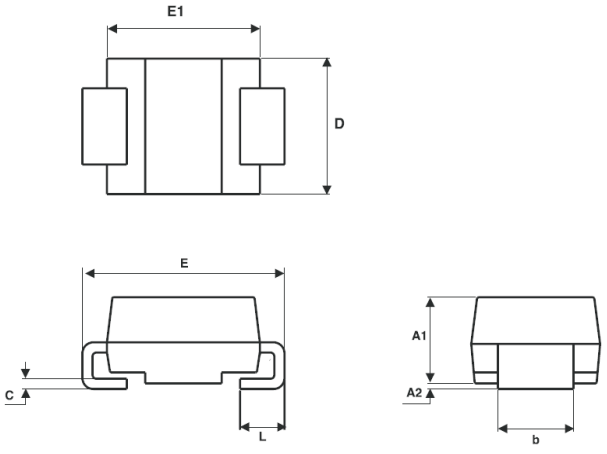


Soldering Parameters

Reflow Condition		Fb – Free assembly
Pre Heat	-Temperature Min ($T_{s(Min)}$)	150°C
	-Temperature Max ($T_{s(Max)}$)	200°C
	-Time (Min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus) Temp (T_L) to peak		3°C/second Max
$T_{S(Max)}$ to T_L - Ramp-up Rate		3°C/second Max
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		250$^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-dowm Rate		6°C/second Max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260°C



Package Outline/Plastic surface mounted package



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.03	0.075	0.080
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

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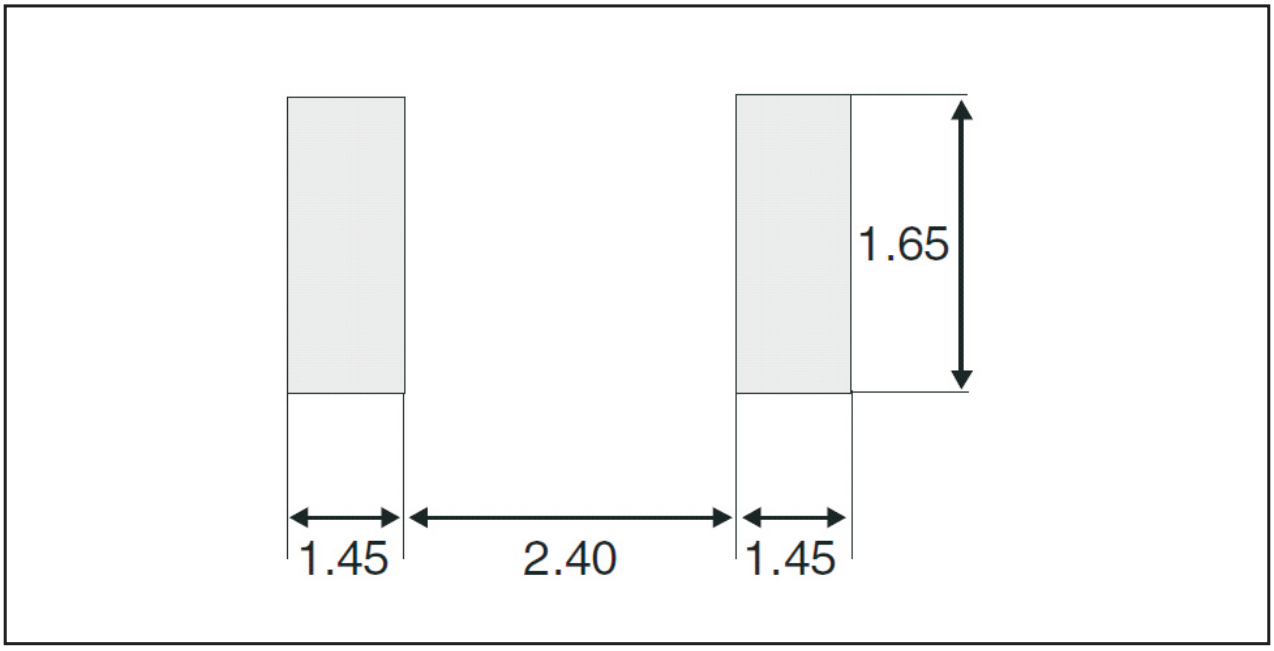
Soldering Footprint



Package And Marking Information

Device	Package	Shipping	Reel Size
SMAJ Series	SMA	5000/Reel	12 inch
SMAJ Series	SMA	2000/Reel	7 inch