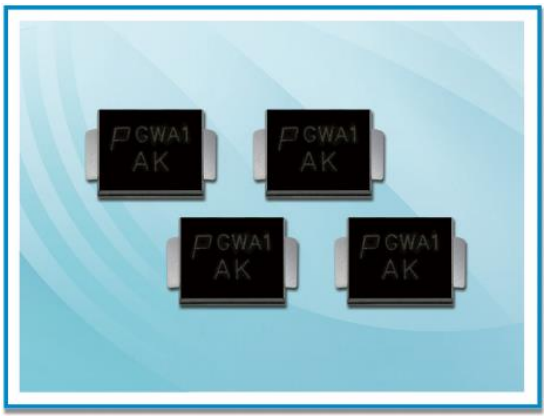
TVS Diode – SMAJ6L Series

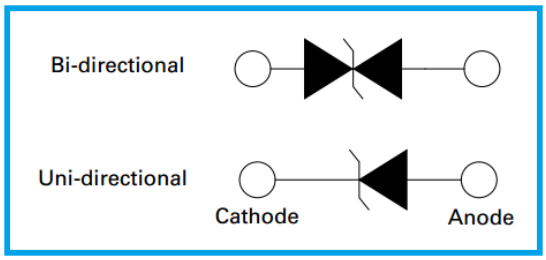
Features

- Plastic package, excellent insulation strength.
- Glass passivated chip junction in SMA package.
- Excellent voltage clamping capability.
- 600W peak pulse power capability on 10/1000μs waveform.
- Typical leakage current less than 1μA above 13V.
- Very fast response time, typically less than 1.0ps from 0 volt to V_{BR} minimum.
- High temperature soldering guaranteed: 265°C/10 sec.
- MSL: JEDEC-J-STD-020, Level 1



Applications

- I/O interface, V_{CC} bus
- Telecom
- Industrial and consumer electronic applications.
- Relay and electromagnetic valve surge absorption.



Mechanical and Physical Data

- Case: JEDEC SMA molded plastic.
- Surface mount device, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denoted cathode except bidirectional.

Maximum Ratings and Thermal Characteristics

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10/1000μs waveform (Note 1, Fig.1).	P_{PPM}	Min 600	Watt
Peak Pulse Current of 10/1000μs waveform (Note 1, Fig.3).	I_{PPM}	See Table	Amp
Steady State Power Dissipation at TL = 75°C, Lead lengths 0.375", (9.5mm) (Fig.5).	$P_{M(AV)}$	5.0	Watt
Peak Forward Surge Current, 8.3 ms Single Half Sine Wave Superimposed on Rated Load (Note 2, Fig.6).	I_{FSM}	100	Amp
Operating Junction and Storage Temperature Range.	T_J, T_{STG}	-55~150	°C

Note:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A = 25°C per Fig.2.
2. 8.3ms single half sine wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

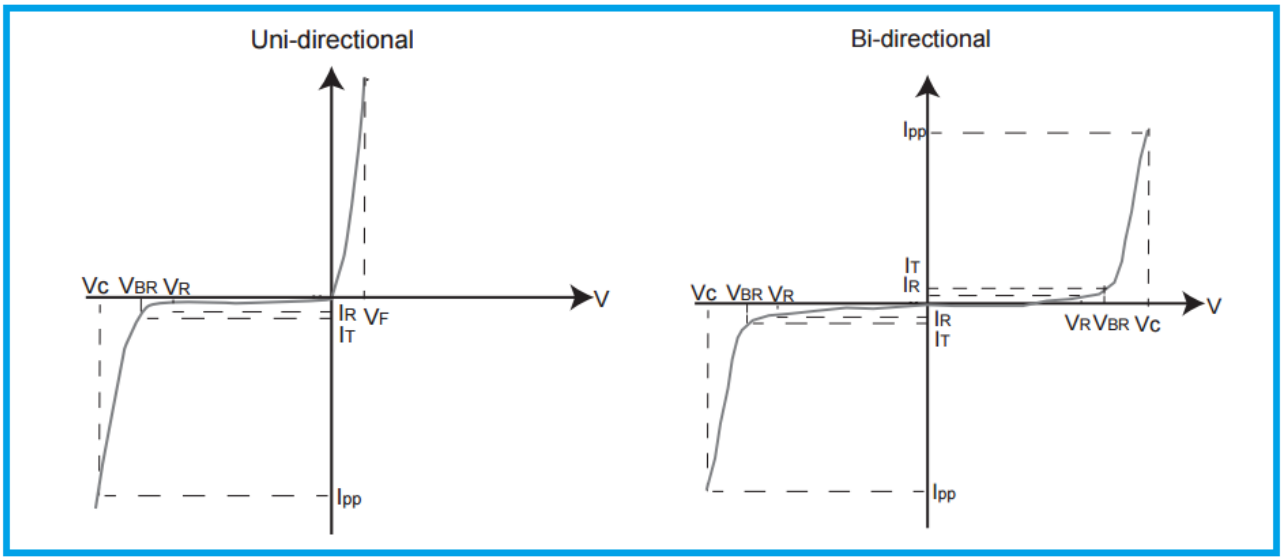
Part Number Code

SMAJ6L □□□ C A

- A: V_{BR} Voltage tolerance (A: 5%; Blank: 10%)
- C: Bi-directional; Blank: Uni-directional
- □□□: Reverse Stand-Off Voltage or Typical Breakdown Voltage
- SMAJ6L: SMAJ6L Series (600W)

TVS Diode – SMAJ6L Series

I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation – Maximum power dissipation

V_R Stand-off Voltage – Maximum voltage that can be applied to the TVS without operation

V_{BR} Breakdown Voltage – Maximum voltage that flows through the TVS at a specified test current (I_T)

V_C Clamping Voltage – Peak voltage measured across the TVS at a specified I_{PPM} (Peak Impulse Current)

I_R Reverse Leakage Current – Current measured at V_R

V_F Forward Voltage Drop for Uni-directional

Electrical Characteristics

Part Number		Marking		Reverse Stand Off Voltage V_R (V)	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C (V) @ I_{PP}	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R (μA) @ V_R
Uni	Bi	Uni	Bi		Min.	Max.				
SMAJ6L5.0A	SMAJ6L5.0CA	AE6	WE6	5.0	6.40	7.00	10	9.2	65.22	800
SMAJ6L6.0A	SMAJ6L6.0CA	AG6	WG6	6.0	6.67	7.37	10	10.3	58.25	800
SMAJ6L6.5A	SMAJ6L6.5CA	AK6	WK6	6.5	7.22	7.98	10	11.2	53.57	500
SMAJ6L7.0A	SMAJ6L7.0CA	AM6	WM6	7.0	7.78	8.60	10	12.0	50.00	200
SMAJ6L7.5A	SMAJ6L7.5CA	AP6	WP6	7.5	8.33	9.21	1	12.9	46.51	100
SMAJ6L8.0A	SMAJ6L8.0CA	AR6	WR6	8.0	8.89	9.83	1	13.6	44.12	50
SMAJ6L8.5A	SMAJ6L8.5CA	AT6	WT6	8.5	9.44	10.4	1	14.4	41.67	20
SMAJ6L9.0A	SMAJ6L9.0CA	AV6	WV6	9.0	10.0	11.1	1	15.4	38.96	10
SMAJ6L10A	SMAJ6L10CA	AX6	WX6	10.0	11.1	12.3	1	17.0	35.29	5
SMAJ6L11A	SMAJ6L11CA	AZ6	WZ6	11.0	12.2	13.5	1	18.2	32.97	1
SMAJ6L12A	SMAJ6L12CA	BE6	XE6	12.0	13.3	14.7	1	19.9	30.15	1
SMAJ6L13A	SMAJ6L13CA	BG6	XG6	13.0	14.4	15.9	1	21.5	27.91	1
SMAJ6L14A	SMAJ6L14CA	BK6	XK6	14.0	15.6	17.2	1	23.2	25.86	1
SMAJ6L15A	SMAJ6L15CA	BM6	XM6	15.0	16.7	18.5	1	24.4	24.59	1
SMAJ6L16A	SMAJ6L16CA	BP6	XP6	16.0	17.8	19.7	1	26.0	23.08	1
SMAJ6L17A	SMAJ6L17CA	BR6	XR6	17.0	18.9	20.9	1	27.6	21.74	1
SMAJ6L18A	SMAJ6L18CA	BT6	XT6	18.0	20.0	22.1	1	29.2	20.55	1

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Part Number		Marking		Reverse Stand Off Voltage V_R (V)	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C (V) @ I_{PP}	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R (μA) @ V_R
Uni	Bi	Uni	Bi		Min.	Max.				
SMAJ6L20A	SMAJ6L20CA	BV6	XV6	20.0	22.2	24.5	1	32.4	18.52	1
SMAJ6L22A	SMAJ6L22CA	BX6	XX6	22.0	24.4	26.9	1	35.5	16.90	1
SMAJ6L24A	SMAJ6L24CA	BZ6	XZ6	24.0	26.7	29.5	1	38.9	15.42	1
SMAJ6L26A	SMAJ6L26CA	CE6	YE6	26.0	28.9	31.9	1	42.1	14.25	1
SMAJ6L28A	SMAJ6L28CA	CG6	YG6	28.0	31.1	34.4	1	45.4	13.22	1
SMAJ6L30A	SMAJ6L30CA	CK6	YK6	30.0	33.3	36.8	1	48.4	12.40	1
SMAJ6L33A	SMAJ6L33CA	CM6	YM6	33.0	36.7	40.6	1	53.3	11.26	1
SMAJ6L36A	SMAJ6L36CA	CP6	YP6	36.0	40.0	44.2	1	58.1	10.33	1
SMAJ6L40A	SMAJ6L40CA	CR6	YR6	40.0	44.4	49.1	1	64.5	9.30	1
SMAJ6L43A	SMAJ6L43CA	CT6	YT6	43.0	47.8	52.8	1	69.4	8.65	1
SMAJ6L45A	SMAJ6L45CA	CV6	YV6	45.0	50.0	55.3	1	72.7	8.25	1
SMAJ6L48A	SMAJ6L48CA	CX6	YX6	48.0	53.3	58.9	1	77.4	7.75	1
SMAJ6L51A	SMAJ6L51CA	CZ6	YZ6	51.0	56.7	62.7	1	82.4	7.28	1
SMAJ6L54A	SMAJ6L54CA	RE6	ZE6	54.0	60.0	66.3	1	87.1	6.89	1
SMAJ6L58A	SMAJ6L58CA	RG6	ZG6	58.0	64.4	71.2	1	93.6	6.41	1

Note:

1. For bi-directional type having V_R of 10 volts and less, the I_R limit is double.

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Ratings and Characteristic Curves

Fig 1 - Peak Pulse Power Rating Curve

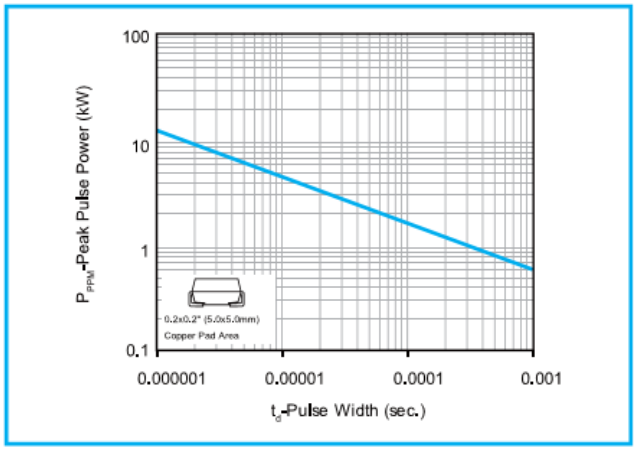


Fig 2 - Pulse Derating Curve

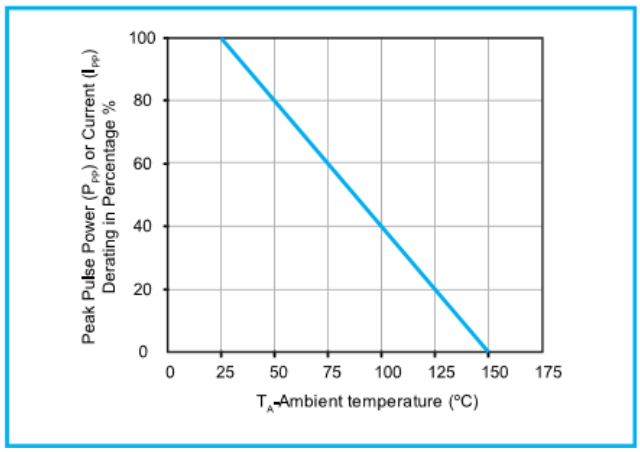


Fig 3 - Pulse Waveform

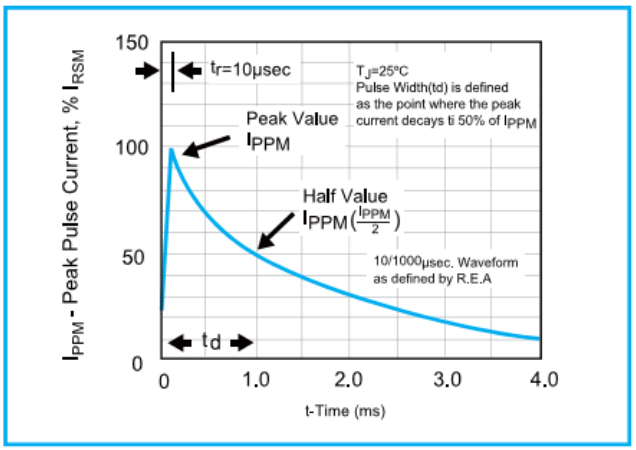


Fig 4 – Typical Junction Capacitance

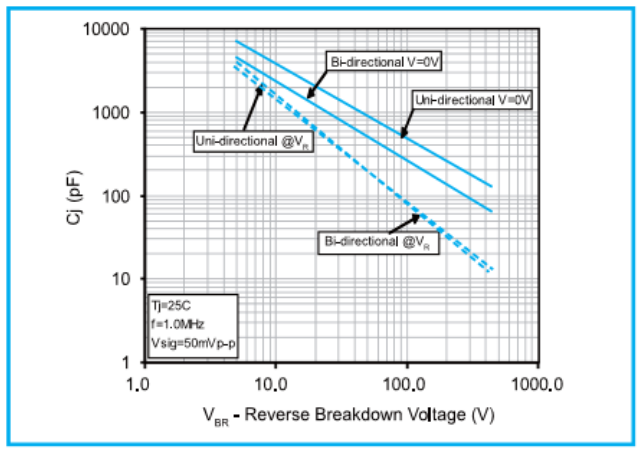


Fig 5 – Steady State Power Dissipation Derating Curve

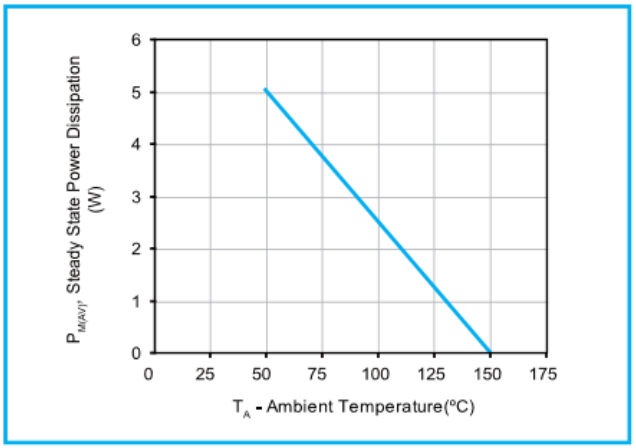
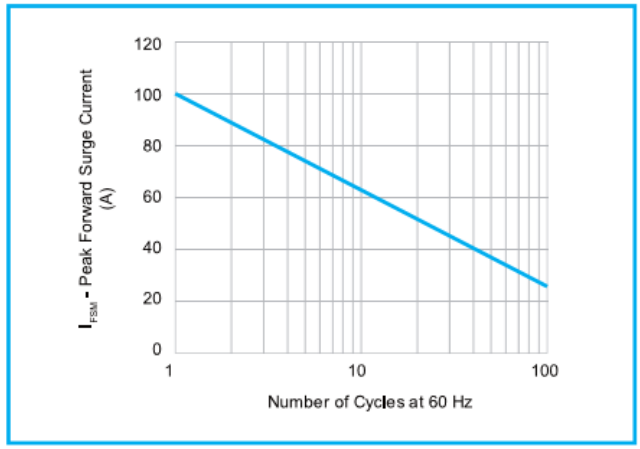


Fig 6 – Maximum Non-Repetitive Forward Surge Current (Uni-directional Only)



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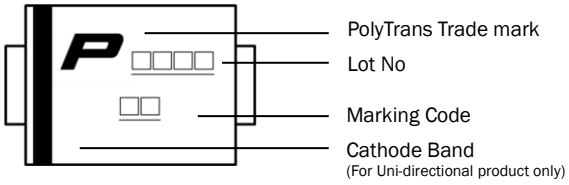
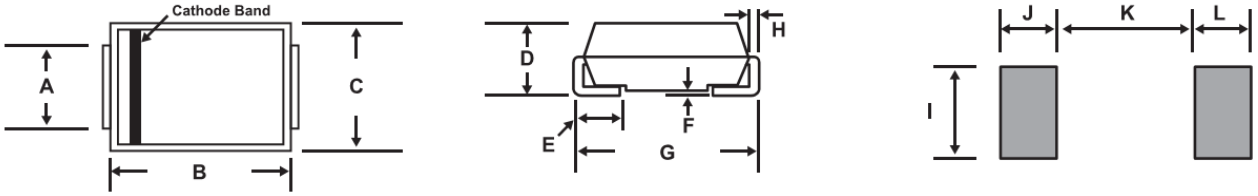
Marking Definitions



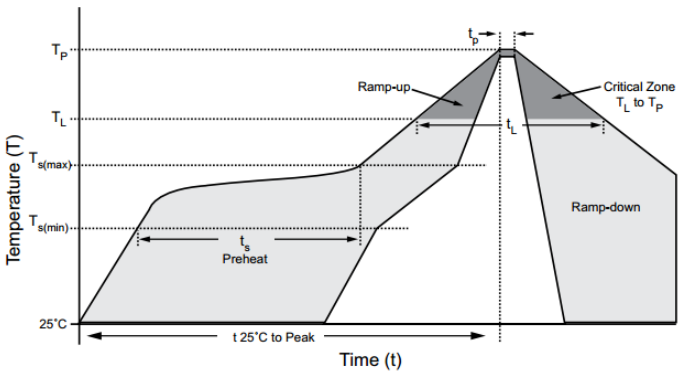
Physical Dimensions



Dimension	Millimeters		Inches	
	Min	Max	Min	Max
A	1.25	1.65	0.049	0.065
B	3.99	4.60	0.157	0.177
C	2.50	2.90	0.100	0.110
D	1.98	2.29	0.078	0.090
E	0.78	1.52	0.030	0.060
F	-	0.203	-	0.008
G	4.93	5.28	0.194	0.208
H	0.15	0.31	0.006	0.012
I	1.80	-	0.070	-
J	2.10	-	0.082	-
K	-	2.30	-	0.090
L	2.10	-	0.082	-

Lead Free Reflow Soldering Recommendations

Preheat	
- Temperature Min (T_{s_min})	150°C
- Temperature Max (T_{s_max})	200°C
- Time (T_{s_min} to T_{s_max})	60-180 seconds
- Average Ramp-Up Rate	1~3°C/second
Peak Temperature	260°C max.
Time within 5°C of actual Peak Temperature (t_p)	40 seconds max.
Ramp-Down Rate	6 °C /second max.



Note: If the soldering temperatures exceed the recommended profile, devices may not meet the performance requirements.

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Packaging Information

Part Number	Packaging Code	Component Package	Quantity	Packaging Option	Packaging Specification
SMAJ6L Series	T13	DO-214AC	5000	Tape & Reel – 12mm tape/13" reel	EIA STD RS-481

Tape and Reel Specifications