

LTKAK6 Series

SMT0-218 - 6 kA



Agency Approvals

Agency	Agency File Number
	E128662

Maximum Ratings and Thermal Characteristics

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating Junction	T_J	-55 to 125	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	
Current Rating ¹	I_{PP}	6	kA
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	10	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	50	$^\circ\text{C/W}$

Note:

1. Rated min I_{PP} measured with 8/20 μs pulse.

Description

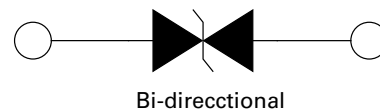
The LTKAK6 series offers superior clamping characteristics over standard S.A.D. technologies by virtue of the Littelfuse Foldback technology, which provides a clamping voltage lower than the avalanche voltage (but above the rated working voltage). Therefore, any voltage rise due to increased current conduction is contained to a minimum, providing the best possible protection level. This LTKAK6 series can be combined in series or parallel solutions to offer various clamping levels and surge withstand options.

The LTKAK6 SMT package provides a more compact PCB layout than typical through-hole AK TVS components.

Features

- High Power TVS designed in a surface mount and compact SMT0-218 package
- Patent granted package design
- Foldback Technology for superior clamping characteristics
- Tube or tape and reel pack options available
- Ideal for automatic pick and place assembly and reflow process to reduce the manufacturing cost and increase the soldering quality as compared to axial leaded packages
- Low clamping and slope resistance.
- Meet MSL level1, per J-STD-020, LF maximum peak of 245°C
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)
- UL Recognized compound meeting flammability rating V-0

Functional Diagram



Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Part Numbers	Standoff Voltage (V_R) (V)	Max. Reverse Leakage (I_R) @ V_R (μA)	Reverse Breakdown Voltage (V_{BR}) @ I_T		Test Current I_T (mA)	Max. Clamping Voltage V_C @ (I_{PP}) (Volts)	Max. Temp Coefficient of V_{BR} ($^\circ\text{C}$)	Max. Capacitance 0V Bias 10kHz (nF)
			Min Volts	Max Volts				
LTKAK6-058C	58	10	64	70	10	110	0.1	6.5
LTKAK6-066C	66	10	72	80	10	120	0.1	5.5
LTKAK6-076C	76	10	85	95	10	140	0.1	4.5

Note: Using 8/20 waveshape as defined in IEC 61000-4-5 2nd edition.

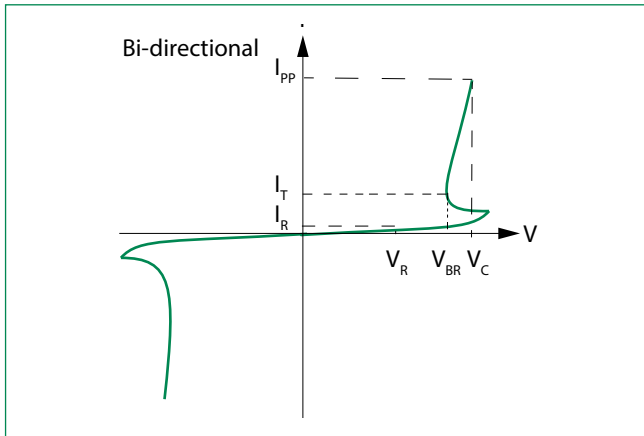
Surge Ratings

Part Numbers	Max Peak Pulse Current (I_{PP})			
	(8/20 μs) (A)	(10/350 μs) (A)		(10/1000 μs) (A)
	Min	Min	Typ	Min
LTKAK6-058C	6,000	900	1,100	430
LTKAK6-066C	6,000	900	1,100	430
LTKAK6-076C	6,000	900	1,100	430

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I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation --

Max 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 --

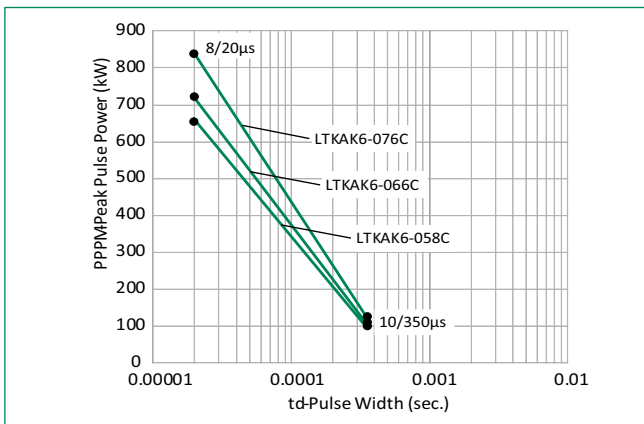
Peak voltage measured across the TVS at a specified I_{ppm} (peak impulse current)

I_R Reverse Leakage Current --

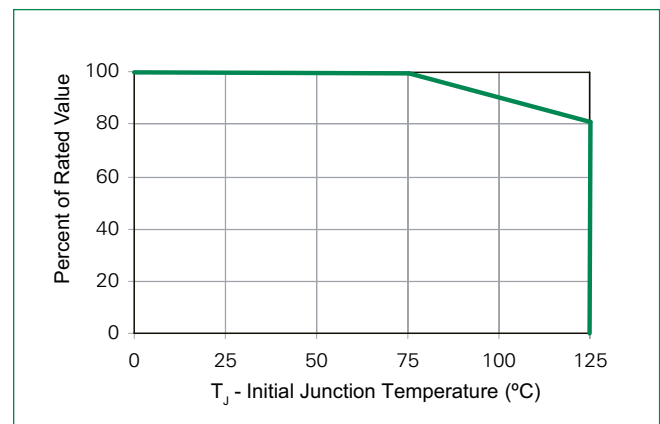
Current measured at V_R

Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)

Typical Peak Pulse Power Rating Curve

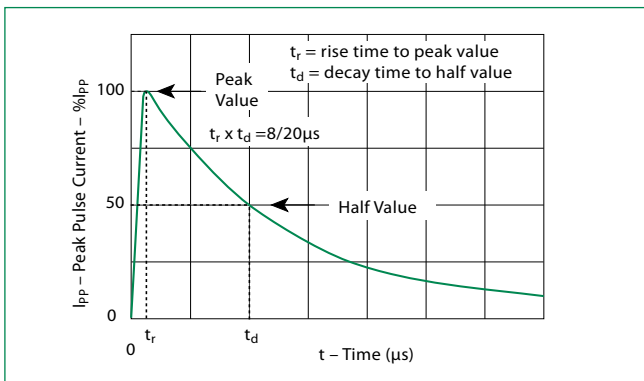


Peak Power Derating



Please contact Littelfuse for reliability or FIT/MTBF data, the performance is subject to vary and depends on the end customers' application condition.

Pulse Waveform

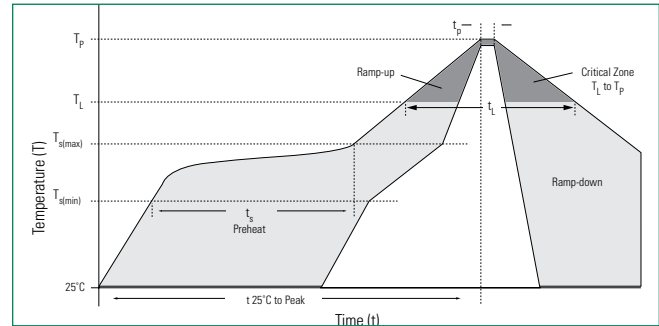


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Soldering Parameters

Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_p)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_A) to peak		3°C/second max
$T_{s(max)}$ to T_A - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_A) (Liquidus)	217°C
	- Time (min to max) (t_p)	60 – 150 seconds
Peak Temperature (T_p)		245 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		30 seconds Max
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes Max.
Do not exceed		245°C



Flow/Wave Soldering (Solder Dipping)

Peak Temperature :	260°C
Dipping Time :	10 seconds
Soldering :	1 time

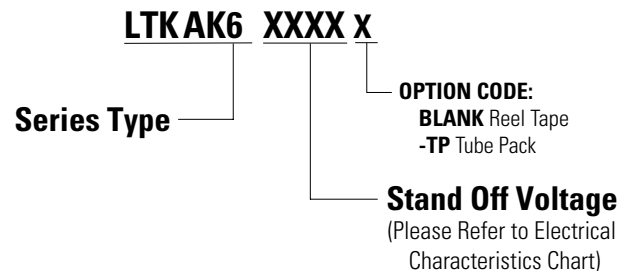
Physical Specifications

Weight	0.153 ounce, 4.34 gram
Case	Epoxy encapsulated
Terminal	Tin plated lead, solderable per MIL-STD-202 Method 208

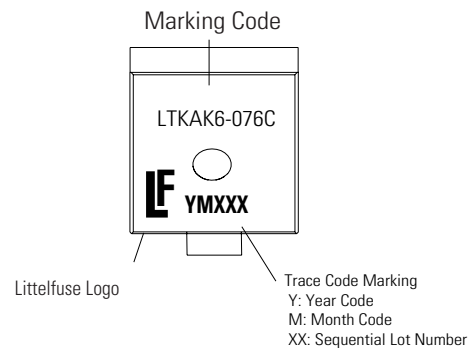
Environmental Specifications

High Temp Voltage Blocking (HTRB)	100 % DC reverse voltage rated 125 °C, 1008 hours JEDEC, JESD22-A-108
Biased Temp & Humidity (H3TRB)	80 % breakdown voltage (+85 °C) 85 %RH, 1008 hours JEDEC, JESD22-A-101
Unbiased Highly Accelerated Stress Test (UHAST)	96 hours at $T_A = 130$ °C/85 %RH. JEDEC, JESD22-A-118
Temp Cycling (TC)	-55 °C to +125 °C, 15 min. dwell, 1000 cycles. JEDEC, JESD22-A104
Moisture Sensitivity Level (MSL)	85 %RH, +85 °C, 168 hours, 3 reflow cycles (+245 °C Peak). JEDEC, JEDEC-J-STD-020, Level 1
Resistance to Solder Heat (RSH)	+245 °C, 30 seconds JEDEC, JEDEC JESD22-A-111

Part Numbering System



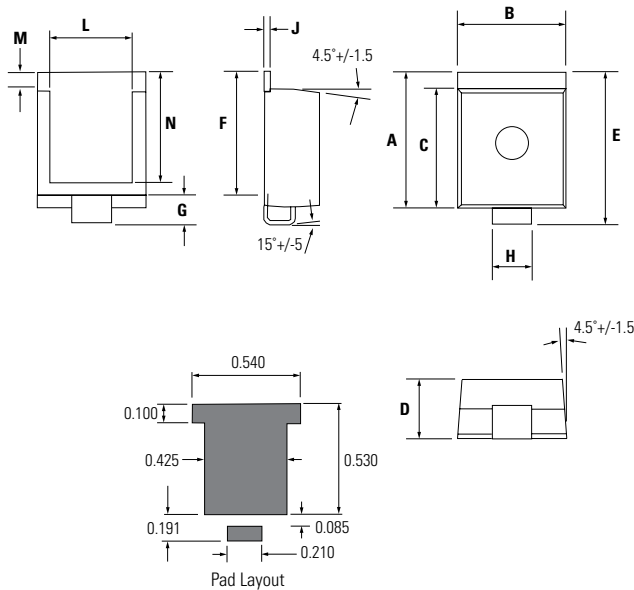
Part Marking System



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Dimensions — SMT0-218

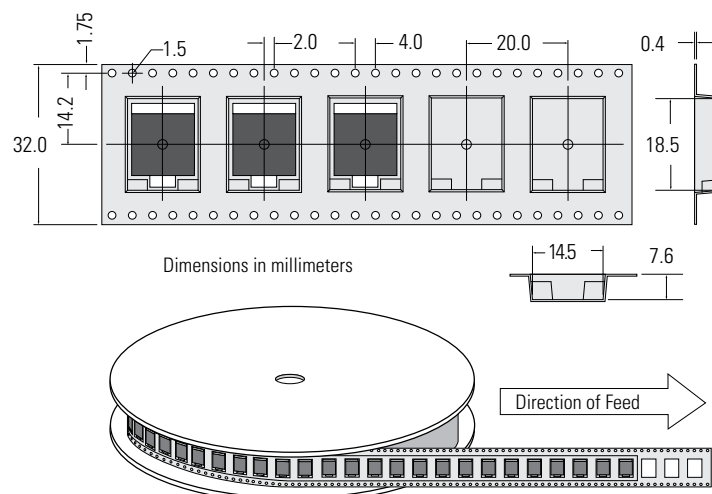


Dimension	Inches		Millimeters	
	Min	Max	Min	Max
A	0.621	0.655	15.78	16.63
B	0.529	0.594	13.43	15.09
C	0.544	0.561	13.83	14.24
D	0.273	0.285	6.94	7.24
E	0.702	0.737	17.82	18.72
F	0.567	0.587	14.40	14.90
G	0.087	0.126	2.20	3.20
H	0.193	0.222	4.89	5.65
J	0.028	0.033	0.72	0.85
L	0.400	0.440	10.17	11.17
M	0.073	0.112	1.85	2.85
N	0.510	0.533	12.95	13.55

Packaging

Part Number	Weight	Packing Mode	Base Quantity
LTKAK6-xxx C	4.34g	Tape & Reel – 32mm/13" tape	400
LTKAK6-xxx C-TP	4.34g	Tube Pack	100(25/Tube)

Tape and Reel Specification



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