

## LTKAK10 Series



### Description

The LTKAK10 series offer superior clamping characteristics over standard S.A.D. technologies by virtue of the Littelfuse Foldbak 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. They can also be connected in series and/or parallel to create various capability and flexible protection solutions.

The LTKAK10 SMT package provides a more compact PCB layout than typical through-hole AK TVS components.

### Agency Approvals

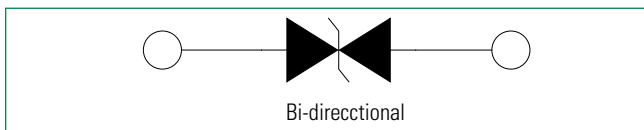
Agency	Agency File Number
	E128662

### Maximum Ratings and Thermal Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating Junction	T <sub>J</sub>	-55 to 125	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to 150	
Current Rating <sup>1</sup>	I <sub>PP</sub>	10	kA
Typical Thermal Resistance Junction to Lead	R <sub>θJL</sub>	10	°C/W
Typical Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	50	°C/W

**Note:**  
1. Rated min I<sub>PP</sub> measured with 8/20μs pulse.

### Functional Diagram



### Features

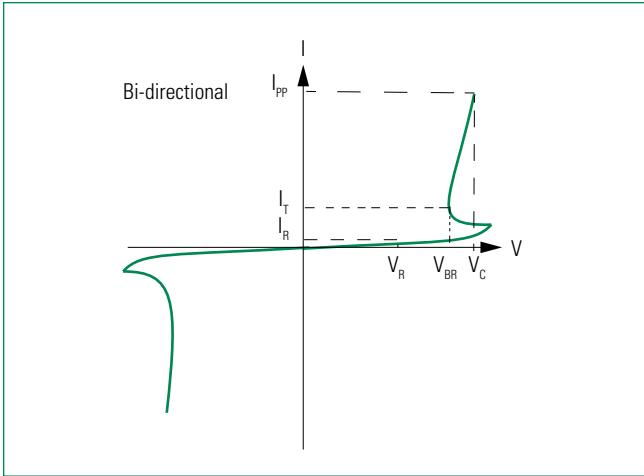
- High Power TVS designed in a surface mount compact SMT0-218 package
- Patent pending package design
- Foldbak technology for superior clamping factor
- Tube or tape and reel pack options available
- Ideal for automatic pick and place assembly and reflow process to reduce the manufacturing cost and increase the soldering quality as compared to axial leaded packages
- Bi-directional
- Meet MSL level 1, per J-STD-020, LF maximum peak of 245°C
- Halogen free and RoHS compliant
- 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

### Electrical Characteristics

Part Numbers	Standoff Voltage (V <sub>SO</sub> ) (V)	Max. Reverse Leakage (I <sub>R</sub> ) @ V <sub>SO</sub> (μA)	Reverse Breakdown Voltage (V <sub>BR</sub> ) @ I <sub>T</sub>		Test Current I <sub>T</sub> (mA)	Max. Clamping Voltage V <sub>CL</sub> @ Peak Pulse Current (I <sub>PP</sub> )			Max. Temp Coefficient of V <sub>BR</sub> (%/°C)	Max. Capacitance 0V Bias 10kHz (nF)	Agency Approval	
			Min Volts	Max Volts		V <sub>CL</sub> Volts	I <sub>PP</sub> (8/20μs) (A)	I <sub>PP</sub> (10/350μs) (A)				
							min	min				typ
LTKAK10-058C	58	10	64	70	10	110	10,000	1,400	1,700	0.1	8.5	x
LTKAK10-066C	66	10	72	80	10	120	10,000	1,400	1,700	0.1	7.5	x
LTKAK10-076C	76	10	85	95	10	140	10,000	1,400	1,700	0.1	6.5	x
LTKAK10-086C	86	10	95	105	10	157	10,000	1,000	1,200	0.1	6.5	x

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

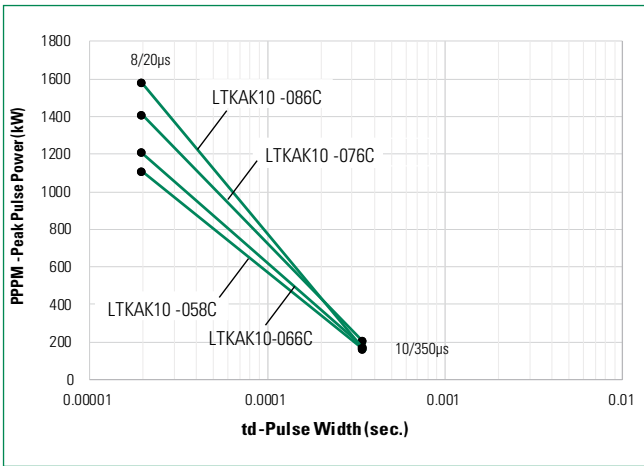
**I-V Curve Characteristics**



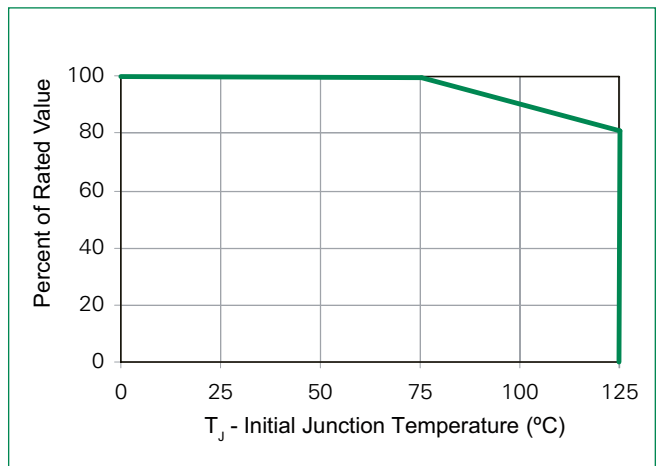
- $P_{PPM}$  Peak Pulse Power Dissipation** --  
Max power dissipation
- $V_R$  Stand-off Voltage** --  
Maximum voltage that can be applied to the TVS without operation
- $V_{BR}$  Breakdown Voltage** --  
Maximum voltage that flows through the TVS at a specified test current ( $I_T$ )
- $V_C$  Clamping 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)**

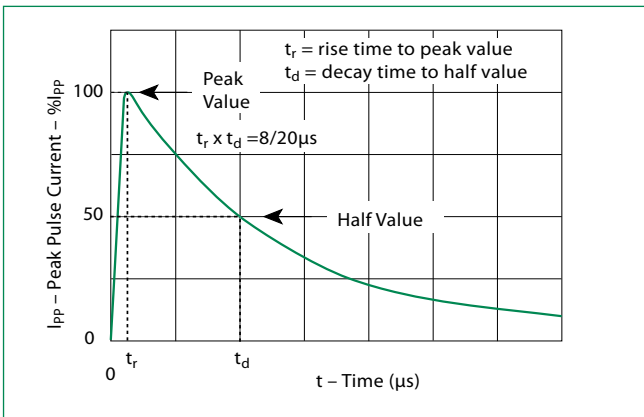
**Typical Peak Pulse Power Rating Curve**



**Peak Power Derating**



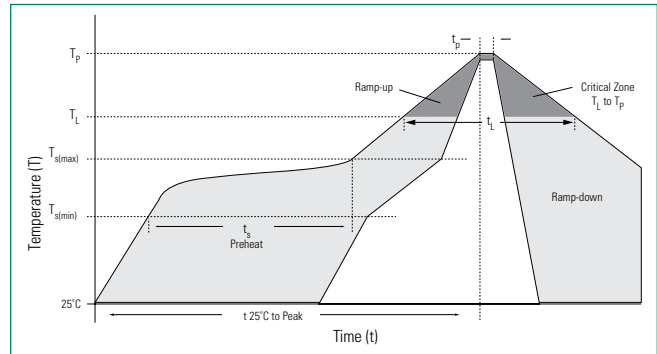
**Pulse Waveform**



Please contact Littelfuse for reliability or FIT/MTBF data, the component's performance is dependent on the application's environmental conditions such as elevated ambient temperatures.

**Soldering Parameters**

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



**Flow/Wave Soldering (Solder Dipping)**

<b>Peak Temperature :</b>	260°C
<b>Dipping Time :</b>	10 seconds
<b>Soldering :</b>	1 time

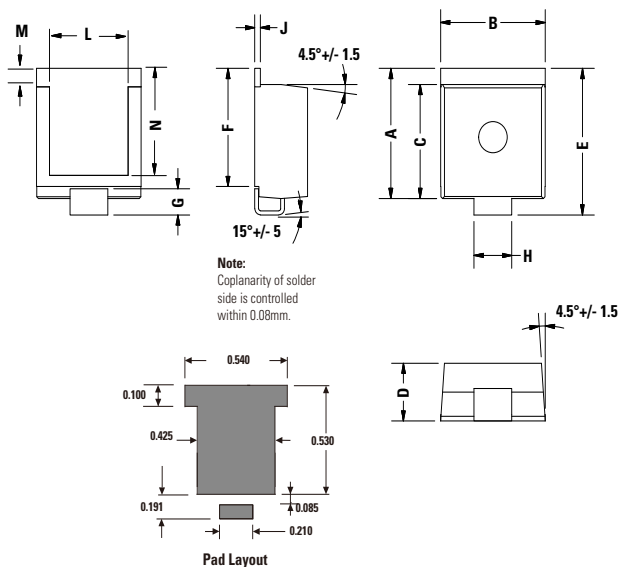
**Physical Specifications**

<b>Weight</b>	Contact manufacturer
<b>Case</b>	Compound encapsulated
<b>Terminal</b>	Tin plated lead, solderable per MIL-STD-202 Method 208

**Environmental Specifications**

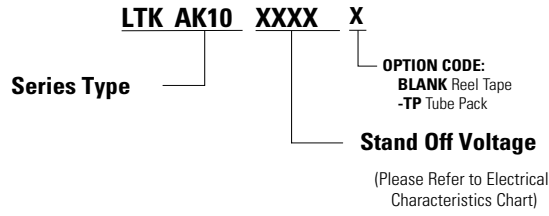
<b>High Temp. Storage</b>	JESD22-A103
<b>HTRB</b>	JESD22-A108
<b>MSL</b>	JESDEC-J-STD-020, Level 1
<b>H3TRB</b>	JESD22-A101
<b>RSH</b>	JESD22-B106

**Dimensions – SMT0-218 Tab**

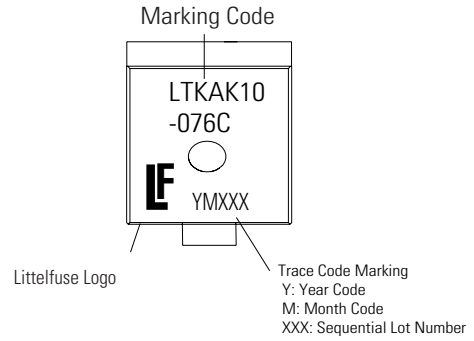


Dimension	Inches		Millimeters	
	Min	Max	Min	Max
<b>A</b>	0.621	0.655	15.78	16.63
<b>B</b>	0.529	0.594	13.43	15.09
<b>C</b>	0.544	0.561	13.83	14.24
<b>D</b>	0.273	0.285	6.94	7.24
<b>E</b>	0.702	0.737	17.82	18.72
<b>F</b>	0.567	0.587	14.40	14.90
<b>G</b>	0.087	0.126	2.20	3.20
<b>H</b>	0.193	0.222	4.89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

**Part Numbering System**



**Part Marking System**



**Packaging**

Part Number	Weight	Packing Mode	Base Quantity
LTKAK10-xxxC	4.34g	Tape & Reel – 32mm/13" tape	400
LTKAK10-xxxC-TP	4.34g	Tube Pack	100(25/Tube)

**Tape and Reel Specification**

