

## 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

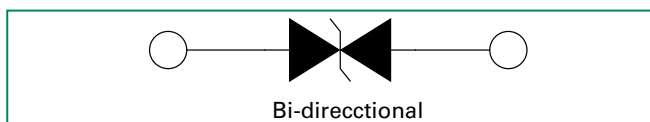
### Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

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

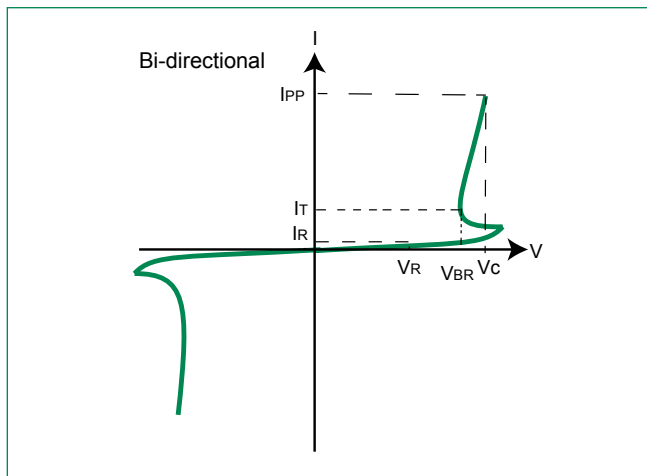
- High Power TVS designed in a surface mount compact SMT0-218 package
- Patent pending package design
- Foldbak technology for superior clamping factor
- Tube or tape and reel pack options available
- Ideal for automatic pick and place assembly and reflow process to reduce the manufacturing cost and increase the soldering quality as compared to axial leaded packages
- Bi-directional
- Meet MSL level 1, per J-STD-020, LF maximum peak of 260°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	950	1,100	0.1	7.5	-
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	-

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

## I-V Curve Characteristics



### **P<sub>PPM</sub> Peak Pulse Power Dissipation –**

Max power dissipation

### **V<sub>R</sub> Stand-off Voltage –**

Maximum voltage that can be applied to the TVS without operation

### **V<sub>BR</sub> Breakdown Voltage –**

Maximum voltage that flows through the TVS at a specified test current (I<sub>T</sub>)

### **V<sub>C</sub> Clamping Voltage –**

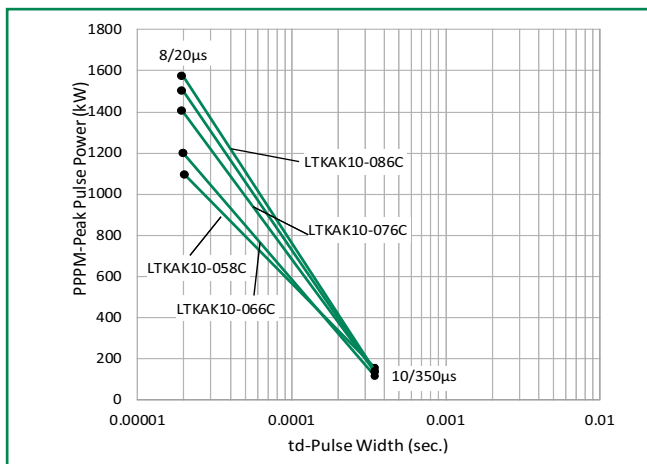
Peak voltage measured across the TVS at a specified I<sub>ppm</sub> (peak impulse current)

### **I<sub>R</sub> Reverse Leakage Current –**

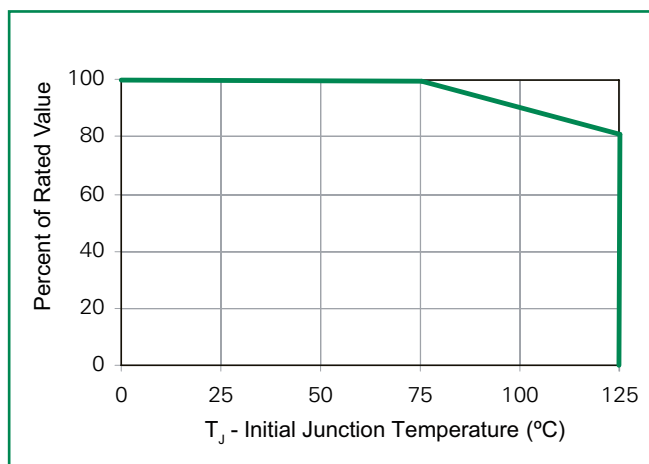
Current measured at V<sub>R</sub>

## Ratings and Characteristic Curves (T<sub>A</sub>=25°C unless otherwise noted)

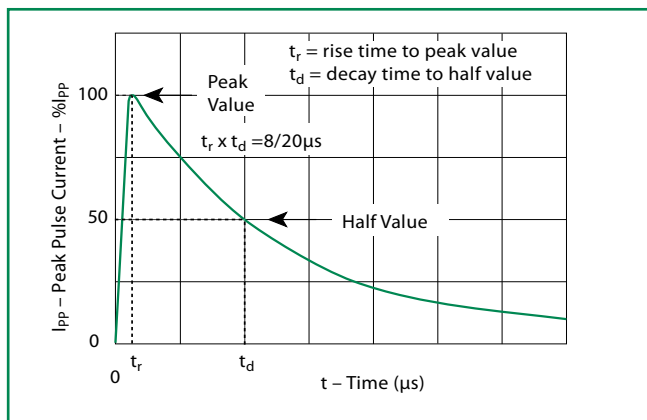
### Typical Peak Pulse Power Rating Curve



### Peak Power Derating



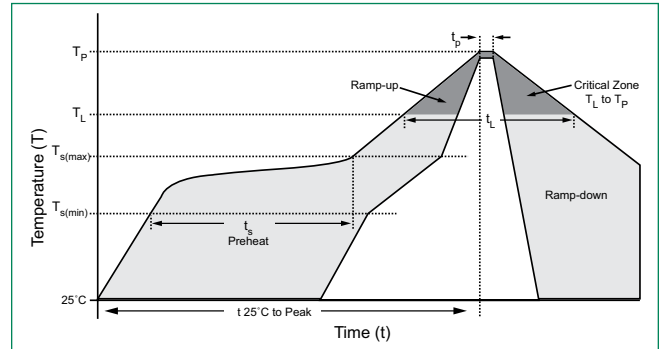
## Pulse Waveform



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

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) ( $t_s$ )	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) ( $t_s$ )	60 – 150 seconds
Peak Temperature ( $T_p$ )		260 <sup>+0/-5</sup> °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 ( $T_p$ )		8 minutes Max.
Do not exceed		260°C



## Flow/Wave Soldering (Solder Dipping)

<b>Peak Temperature :</b>	265°C
<b>Dipping Time :</b>	10 seconds
<b>Soldering :</b>	1 time

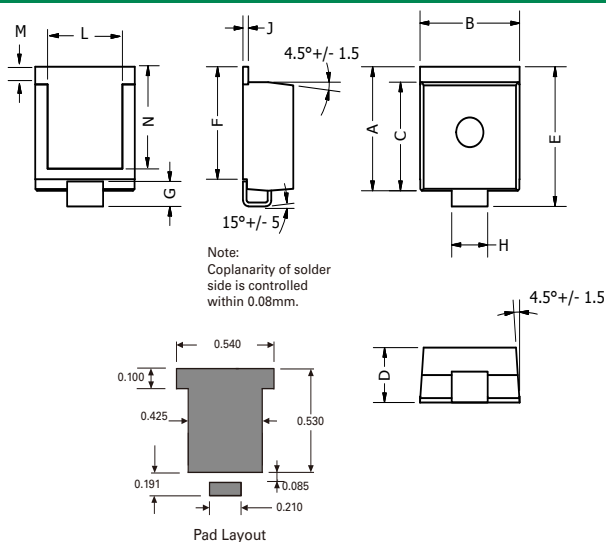
## Physical Specifications

<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

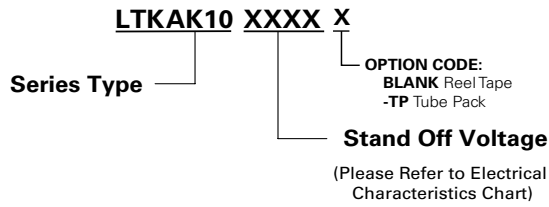
<b>High Temp. Storage</b>	JESD22-A103
<b>HTRB</b>	JESD22-A108
<b>MSL</b>	JESDEC-J-STD-020, Level 1
<b>H3TRB</b>	JESD22-A101
<b>RSH</b>	JESD22-B106

## Dimensions — SMT0-218 Tab

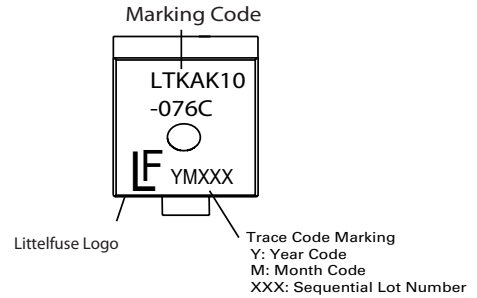


Dimension	Inches		Millimeters	
	Min	Max	Min	Max
A	0.621	0.655	15.78	16.63
B	0.529	0.594	13.43	15.09
C	0.544	0.561	13.83	14.24
D	0.273	0.285	6.94	7.24
E	0.702	0.737	17.82	18.72
F	0.567	0.587	14.40	14.90
G	0.087	0.126	2.20	3.20
H	0.193	0.222	4.89	5.65
J	0.028	0.033	0.72	0.85
L	0.400	0.440	10.17	11.17
M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

### Part Numbering System



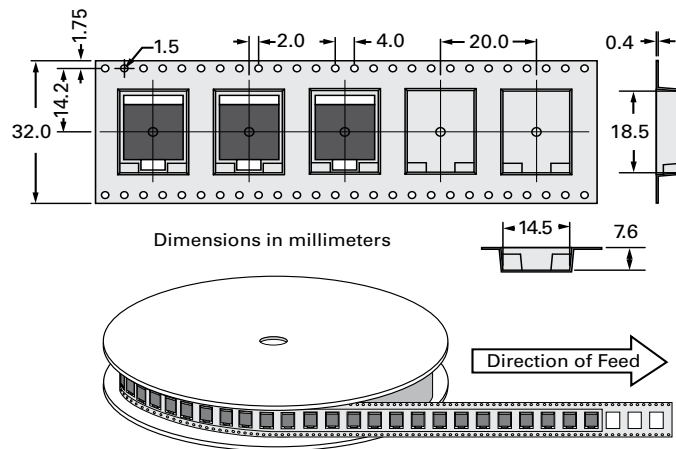
### Part Marking System



### 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



**Disclaimer Notice** - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at <http://www.littelfuse.com/disclaimer-electronics>.