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	Agncy File Number
	E128662

Features

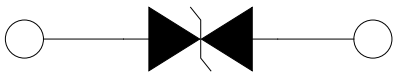
- High Power TVS designed in a surface mount compact SMTO-218 package
- Patent pending package design
- Foldbak technology for superior clamping factor
- Tube or tape and reel pack options available
- Ideal for automatic pick and place assembly and reflow process to reduce the manufacturing cost and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

Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

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

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

Functional Diagram



Bi-direcctional

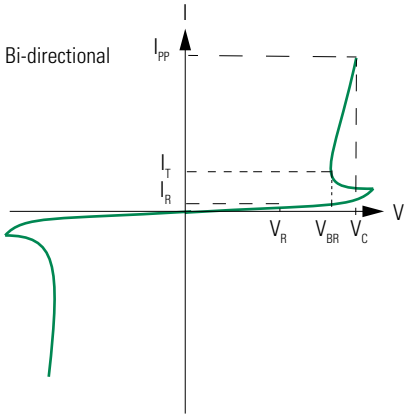
Electrical Characteristics

Part Numbers	Standoff Voltage (V_{SO}) (V)	Max. Reverse Leakage (I_R) @V_{SO} (µA)	Reverse Breakdown Voltage (V_{BR}) @ I_T		Test Current I_T	Max. Clamping Voltage V_{CL} @ Peak Pulse Current (I_{PP})				Max. Temp Coefficient of V_{BR}	Max. Capacitance 0V Bias 10kHz	Agency Approval
			Min Volts	Max Volts	(mA)	V_{CL} Volts	I_{PP} (8/20µs) (A)	I_{PP} (10/350µs) (A)		(%/°C)	(nF)	
							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.

Revised: 02/10/20

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

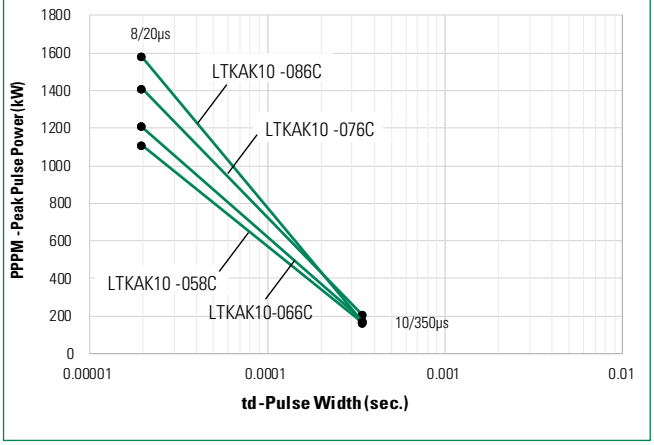
V_{BR} Breakdown Voltage --
Maximum voltage that flows though the TVS at a specified test current (I_T)

V_C Clamping Voltage --
Peak voltage measured across the TVS at a specified Ippm (peak impulse current)

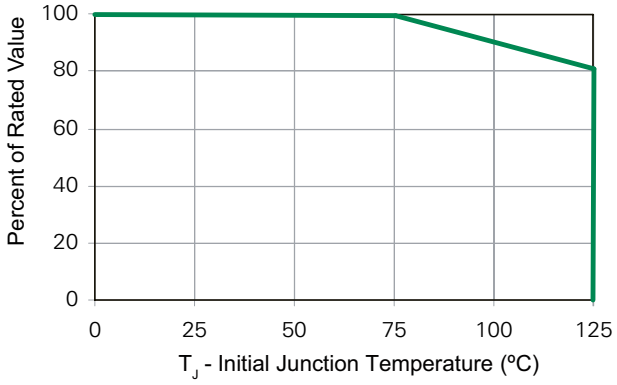
I_R Reverse Leakage Current --
Current measured at V_R

Ratings and Characteristic Curves (T_A=25°C unless otherwise noted)

Typical Peak Pulse Power Rating Curve

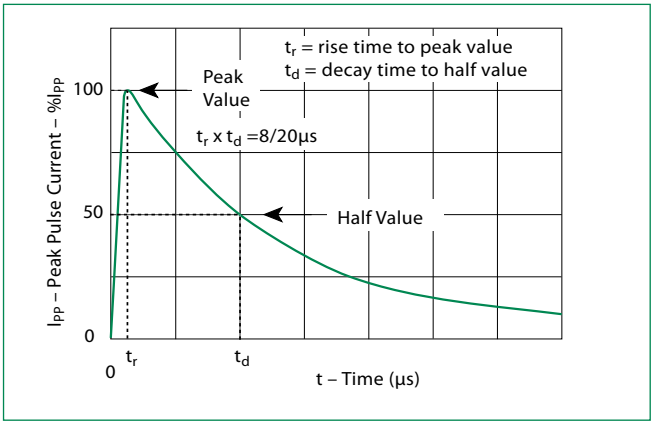


Peak Power Derating



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.

Pulse Waveform



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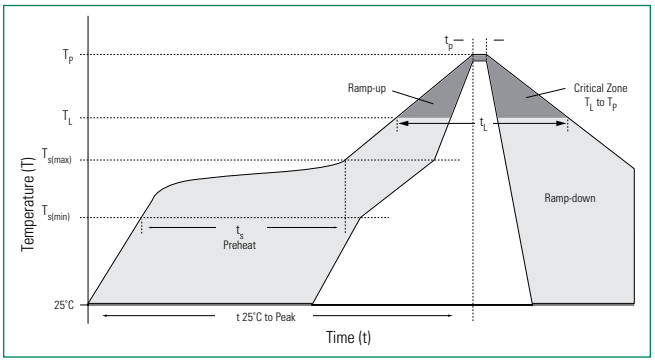
TVS Diodes
SMTO-218 - 10 kA > LTKAK10 series

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)		$245^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		30 seconds
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

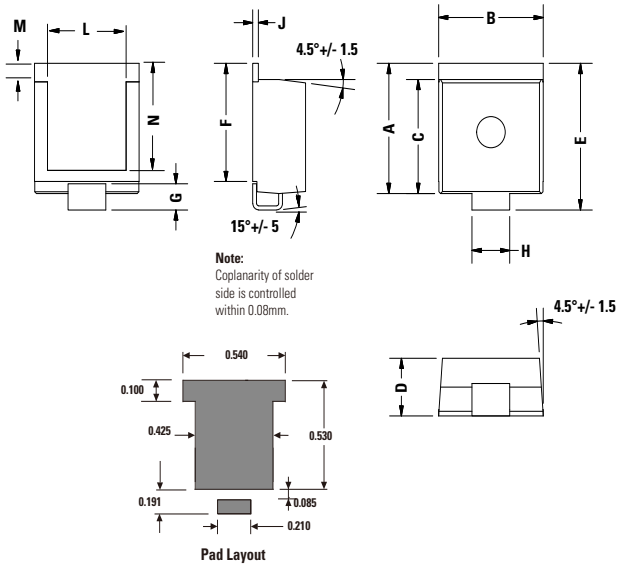
Physical Specifications

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

Environmental Specifications

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

Dimensions — SMTO-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

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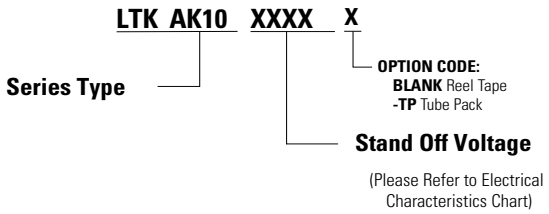
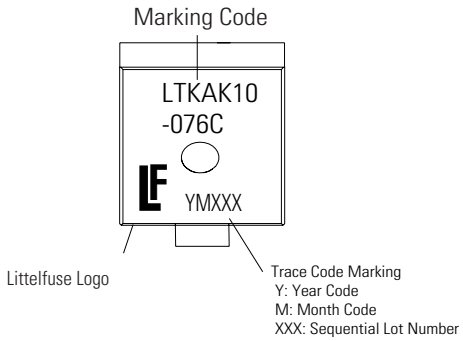
Part Numbering System



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