LTKAK2-L Series
Surface Mount – 2 kA



Description

The LTKAK2-L series offers a clamping voltage lower than alternative technologies such as MOVs and GDTs. Rated to 2 kA (8/20µS) surge current, LTKAK2-L series offers a high level of protection for mission critical and high reliability applications. It aids compliance to surge requirements such as IEC 61000-4-5 (Level 4).

The compact surface mount SMTO-218 package is compatible with automated PCBA processes and enables high power density designs

Features & Benefits

- High Power TVS in a compact, surface mount, package
- Ideal for automated PCB assembly process, reducing manufacturing costs and improving soldering quality, as compared to axial leaded packages
- Bi-directional devices
- 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 epoxy meeting flammability rating V-0

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

Parameter	Symbol	Value	Unit
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-40 to 125	°C
Current Rating[1]	I_{PP}	2	kA

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

Functional Diagram



Bi-directional

Electrical Characteristics (T_A = 25 °C unless otherwise noted)

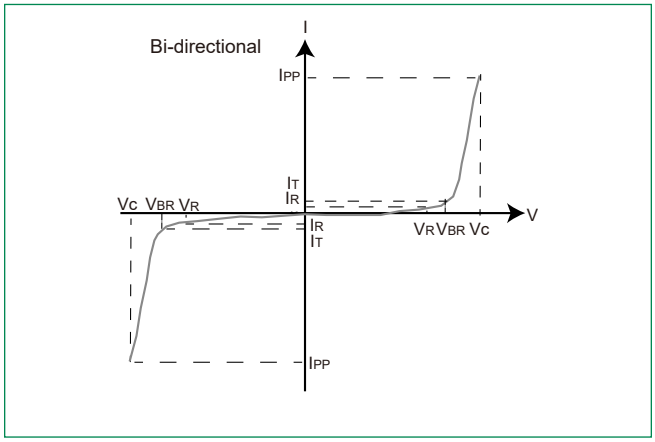
Part Number	Standoff Voltage (V_R) (V)	Max. Reverse Leakage (I_R) @V_R µA	Reverse Breakdown Voltage (V_{BR}) @ I_T		Test Current I_T	Max. Clamping Voltage V_C @ I_{PP} Peak Pulse Current (I_{PP}) (Note 1)		Max. Temp Coefficient of V_{BR}	Max. Capacitance 0 Bias 10 kHz
			Min Volts	Max Volts	(mA)	V_C Volts	I_{PP} Amps	(%/°C)	(nF)
LTKAK2-150C-L	150	10	167.0	185.0	5	243	2,000	0.1	7.0
LTKAK2-160C-L	160	10	178.0	197.0	5	259	2,000	0.1	6.5
LTKAK2-170C-L	170	10	189.9	208.9	5	275	2,000	0.1	6.5

Note: Using 8/20 µs wave shape as defined in IEC 61000-4-5.

© 2023 Littelfuse, Inc.
Specifications are subject to change without notice.

LTKAK2-L Series
Surface Mount – 2 kA

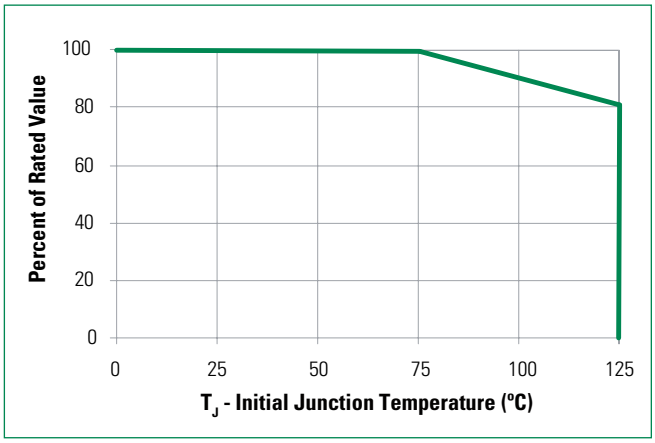
I-V Curve Characteristics



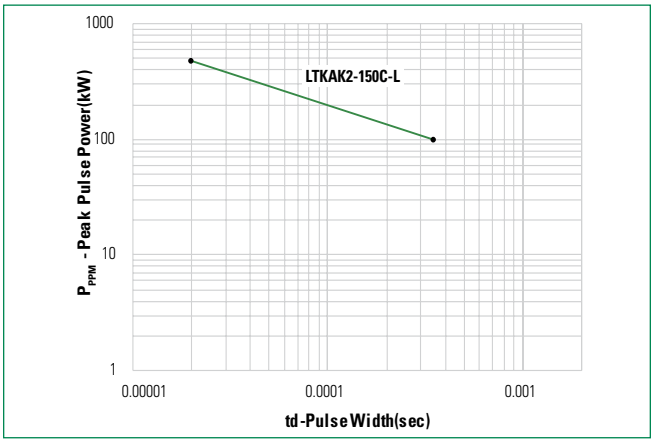
P_{PPM} Peak Pulse Power Dissipation -- Max power dissipation
V_R Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation
V_{BR} Breakdown Voltage -- Maximum voltage that flows though the TVS at a specified test current (I_T)
V_C Clamping Voltage -- Peak voltage measured across the TVS at a specified Ippm (peak impulse current)
I_R Reverse Leakage Current -- Current measured at V_R
V_F Forward Voltage Drop for Uni-directional

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

Peak Power Derating



Typical Peak Pulse Power Rating Curve

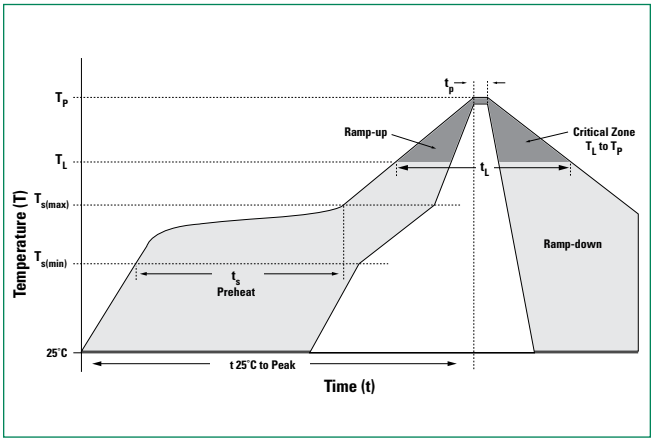


© 2023 Littelfuse, Inc.
Specifications are subject to change without notice.

LTKAK2-L Series
Surface Mount – 2 kA

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 – 120 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3 °C/second max
$T_{S(max)}$ to T_A - Ramp-up Rate		3 °C/second max
Reflow	**-Temperature (T_L) (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



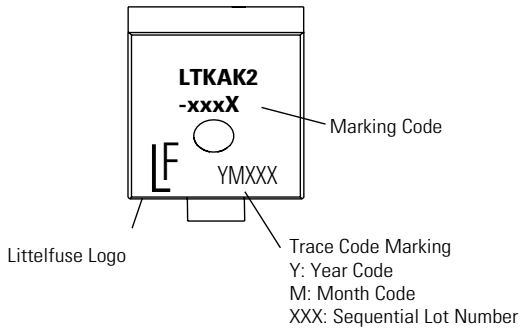
Physical Specifications

Weight	0.159 ounce, 4.5 gram
Case	Epoxy encapsulated
Terminal	Tin plated lead, solderable per MIL-STD-202 Method 208

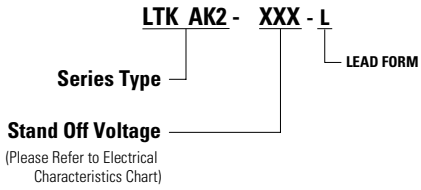
Environmental Specifications

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 TA = 130 °C/85 %RH. JEDEC, JESD22-A-118
Temp Cycling (TC)	-40 °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 Marking System



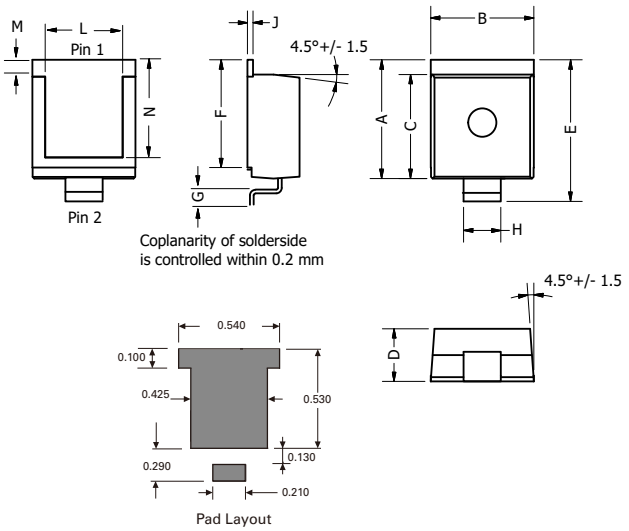
Part Marking System



© 2023 Littelfuse, Inc.
Specifications are subject to change without notice.

LTKAK2-L Series
Surface Mount – 2 kA

Dimensions

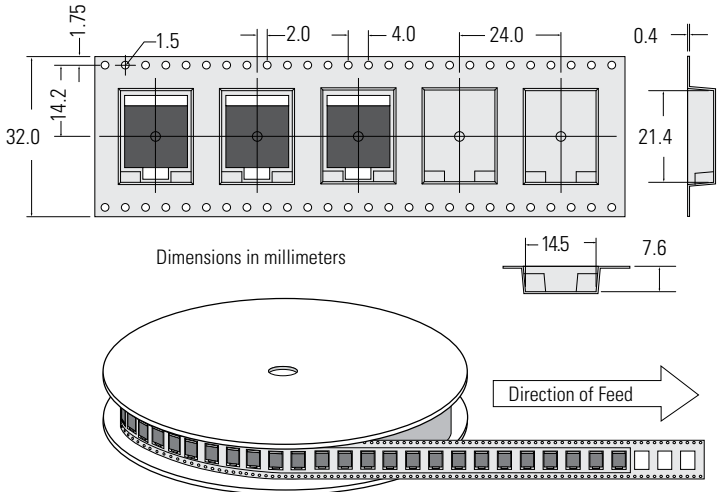


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.621	0.655	15.78	16.63
B	0.529	0.594	13.43	15.09
C	0.544	0.561	13.83	14.24
D	0.273	0.285	6.94	7.24
E	0.768	0.843	19.52	21.42
F	0.567	0.587	14.40	14.90
G	0.087	0.126	2.20	3.20
H	0.193	0.222	4.89	5.65
J	0.028	0.033	0.72	0.85
L	0.400	0.440	10.17	11.17
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
LTKAK2-150C-L	4.5g	Tape & Reel – 32mm/13" tape	400
LTKAK2-160C-L	4.5g	Tape & Reel – 32mm/13" tape	400
LTKAK2-170C-L	4.5g	Tape & Reel – 32mm/13" tape	400
LTKAK2-150C-LTP	4.5g	Tube Pack	100(25/Tube)
LTKAK2-160C-LTP	4.5g	Tube Pack	100(25/Tube)
LTKAK2-170C-LTP	4.5g	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.

Littelfuse

© 2023 Littelfuse, Inc.
Specifications are subject to change without notice.