

LTKAK3 Series

SMT0-218 - 3 kA



Agency Recognitions

| Agency | Agency File Number |
|--------|--------------------|
| | E128662 |

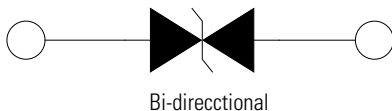
Maximum Ratings and Thermal Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|-----------------|------------|----------------------|
| Operating Junction Temperature | T_J | -55 to 125 | $^{\circ}\text{C}$ |
| Storage Temperature | T_{STG} | -55 to 150 | $^{\circ}\text{C}$ |
| Current Rating ¹ | I_{PP} | 3 | 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.

Functional Diagram



Description

The LTKAK3 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 LTKAK3 series can be combined in series or parallel solutions to offer various clamping levels and surge withstand options.

The LTKAK3 SMT package provides a more compact PCB layout than typical through-hole TO-218 AK TVS components.

Features & Benefits

- Compact design having the Hi Power TVS in surface mount package
- Patent granted package design
- Foldback 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
- Meet MSL level1, per J-STD-020, LF maximum peak of 245 $^{\circ}\text{C}$
- 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
- UL Recognized as an Isolated Loop Circuit Protector to UL 497B

Surge Ratings

| Part Numbers | Max. Peak Pulse Current (I_{PP}) | | |
|--------------|--------------------------------------|-----------------------------|------------------------------|
| | (8/20 μs) (A) | (10/350 μs) (A) | (10/1000 μs) (A) |
| | min | min | min |
| LTKAK3-066C | 3,000 | 800 | 500 |

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

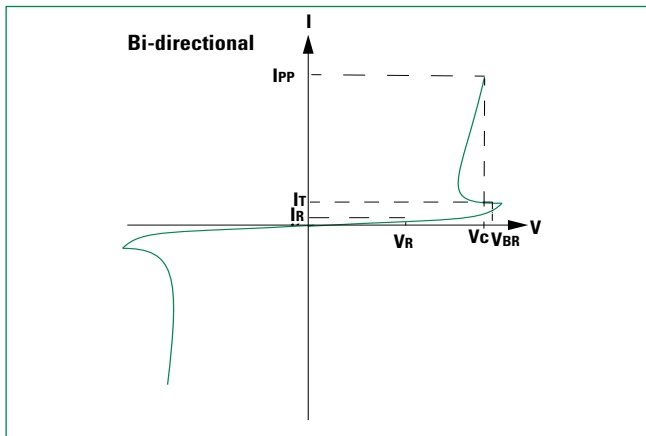
| Part Numbers | Standoff Voltage (V_R) Volts | Max. Reverse Leakage (I_R) @ V_R μA | Reverse Breakdown Voltage (V_{BR}) @ I_T | | Test Current I_T μA | Max. Clamping Voltage V_C @ I_{PP} Volts | Max. Temp Coefficient OF V_{BR} ($^{\circ}\text{C}$) | Max. Capacitance 0V bias 10kHz (nF) |
|--------------|----------------------------------|--|--|-----------|----------------------------------|--|--|-------------------------------------|
| | | | Min Volts | Max Volts | | | | |
| LTKAK3-066C | 66 | 10 | 75 | 83 | 40 | 120 | 0.1 | 6 |

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

LTKAK3 Series

SMT0-218 - 3 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 --

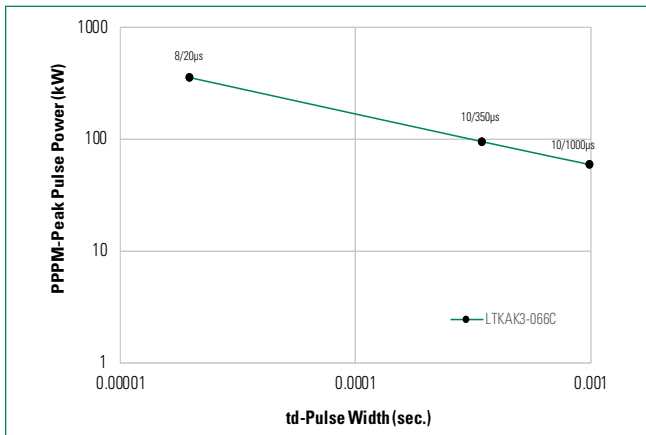
Peak voltage measured across the TVS at a specified I_{ppm} (peak impulse current)

I_R Reverse Leakage Current --

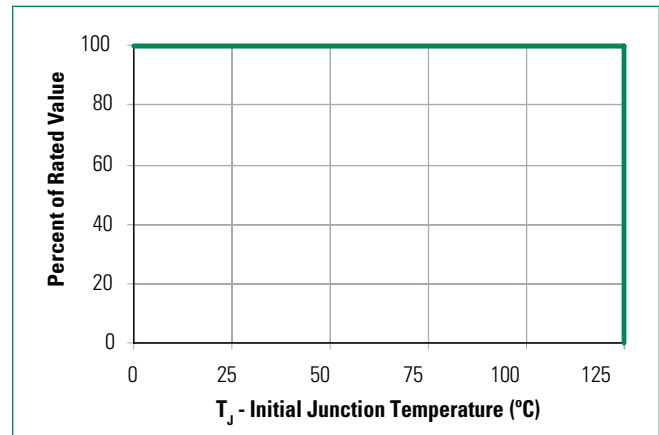
Current measured at V_R

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

Typical Peak Pulse Power Rating Curve

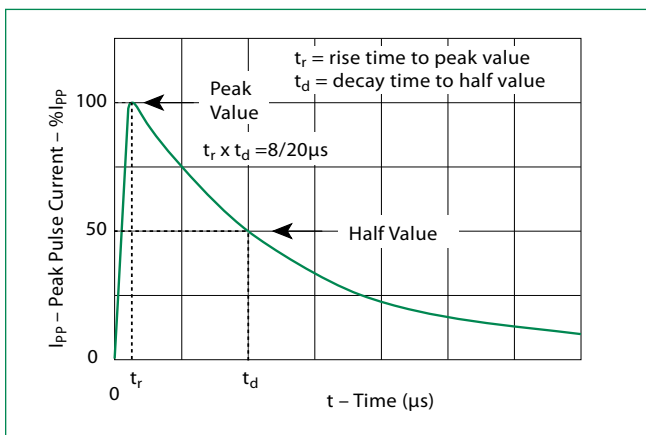


Peak Power Derating



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

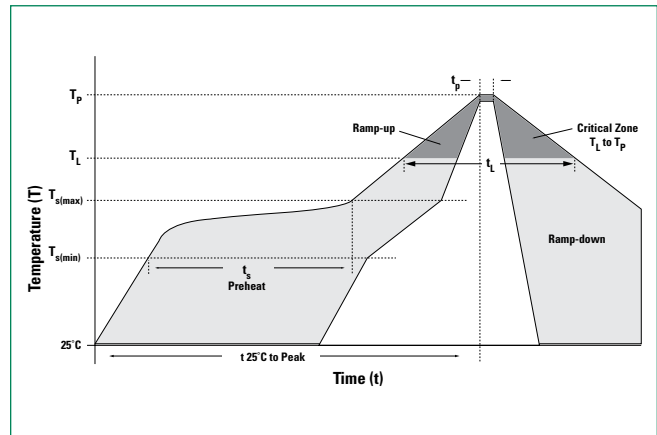


LTKAK3 Series

SMT0-218 - 3 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 – 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 Max |
| 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 | 0.149 ounce, 4.215 gram |
| Case | Compound encapsulated |
| Terminal | Tin plated lead, solderable per MIL-STD-202 Method 208 |

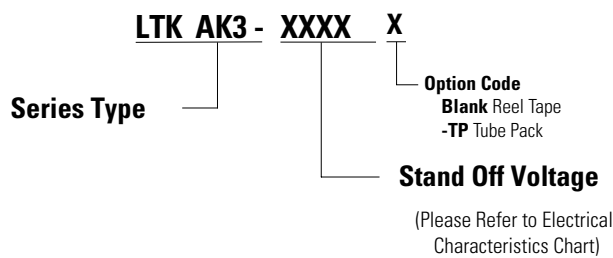
Flow/Wave Soldering (Solder Dipping)

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

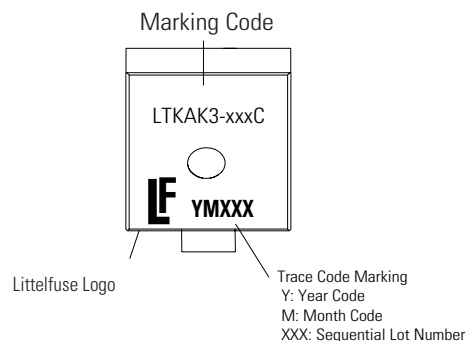
Environmental Specifications

| | |
|--|--|
| 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



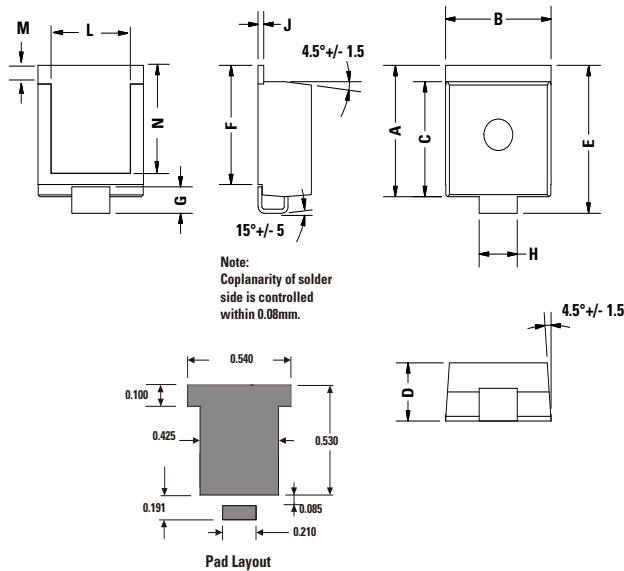
Part Marking System



LTKAK3 Series

SMT0-218 - 3 kA

Dimensions – SMT0-218

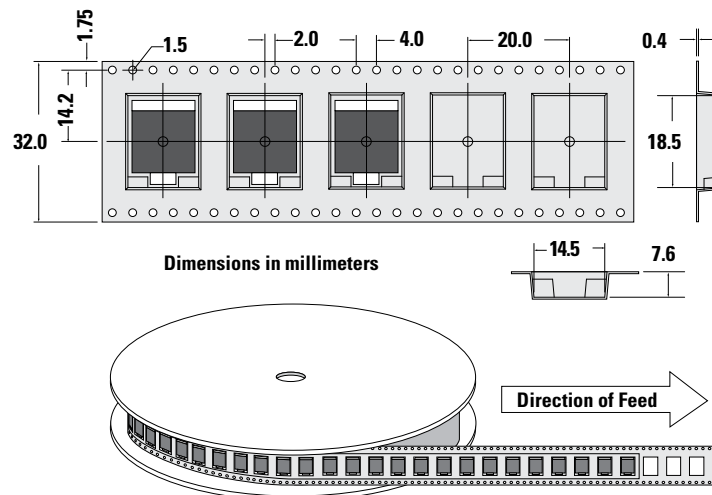


| Dimension | Inches | | Millimeters | |
|-----------|--------|-------|-------------|-------|
| | Min | Max | Min | Max |
| A | 0.621 | 0.655 | 15.78 | 16.63 |
| B | 0.529 | 0.594 | 13.43 | 15.09 |
| C | 0.544 | 0.561 | 13.83 | 14.24 |
| D | 0.273 | 0.285 | 6.94 | 7.24 |
| E | 0.702 | 0.737 | 17.82 | 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 |
|----------------|--------|-----------------------------|---------------|
| LTKAK3-xxxC | 4.215g | Tape & Reel – 32mm/13" tape | 400 |
| LTKAK3-xxxC-TP | 4.215g | 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>.