

**LTKAK3 Series**



**Agency Recognitions**

| 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 Temperature                 | T <sub>J</sub>   | -55 to 125 | °C   |
| Storage Temperature                            | T <sub>STG</sub> | -55 to 150 | °C   |
| Current Rating <sup>1</sup>                    | I <sub>PP</sub>  | 3          | 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.

**Description**

The LTKAK3 series offers 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. 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**

- Compact design having the Hi Power TVS in surface mount package
- Patent granted 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
- Meet MSL level1, 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
- Meets MSL level 1, per J-STD-020, lead frame maximum peak of 260°C
- UL Recognized as an Isolated Loop Circuit Protector to UL 497B

**Electrical Characteristics** (T<sub>A</sub>=25°C unless otherwise noted)

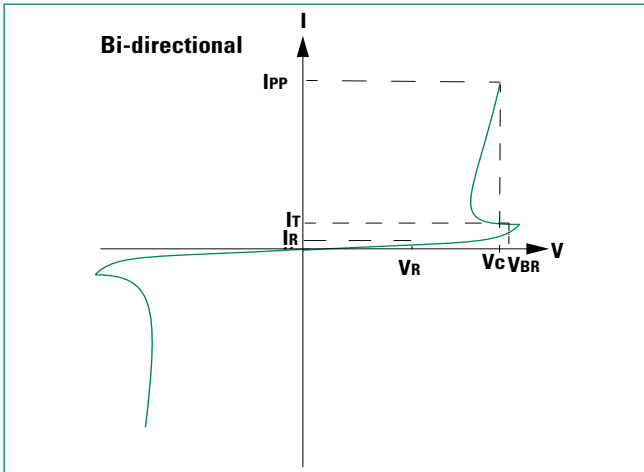
| Part Numbers | Standoff Voltage (V <sub>SO</sub> ) Volts | Max. Reverse Leakage (I <sub>R</sub> ) @ V <sub>SO</sub> µA | Reverse Breakdown Voltage (V <sub>BR</sub> ) @ I <sub>T</sub> |           | Test Current I <sub>T</sub> µA | Max. Clamping Voltage V <sub>CL</sub> @ I <sub>PP</sub> Volts | Max. Temp Coefficient OF V <sub>BR</sub> (%/°C) | Max. Capacitance 0V bias 10kHz (nF) |
|--------------|---|---|---|-----------|--------------------------------|---|---|-------------------------------------|
|              |   |   | Min Volts   | Max Volts |                                |   |   |                                     |
| LTKAK3-066C  | 66  | 10  | 75  | 83        | 40                             | 120   | 0.1   | 6                                   |

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

**Surge Ratings**

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

**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 --**

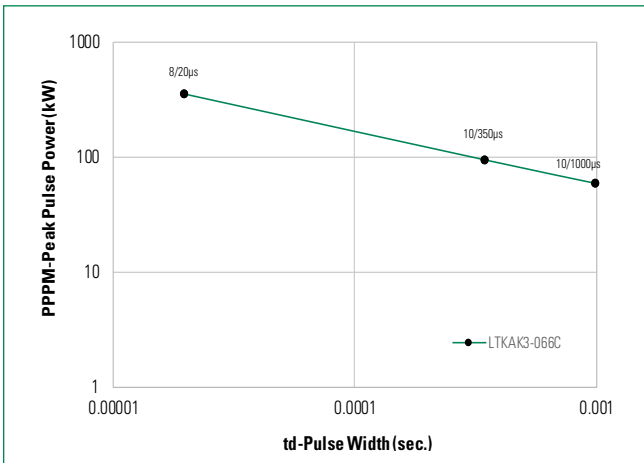
Peak voltage measured across the TVS at a specified I<sub>ppm</sub> (peak impulse current)

**I<sub>R</sub> Reverse Leakage Current --**

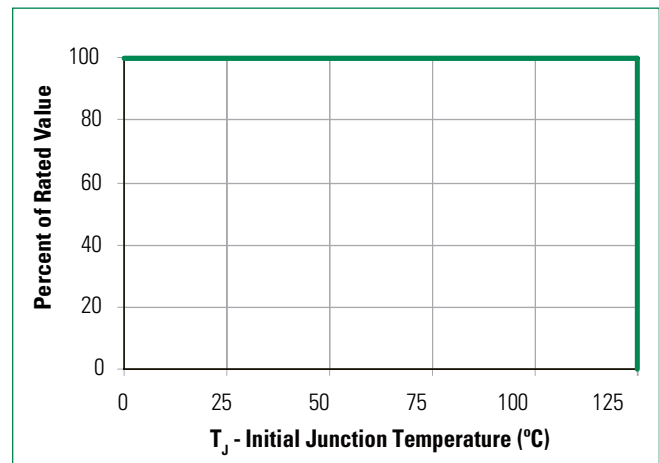
Current measured at V<sub>R</sub>

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

**Typical Peak Pulse Power Rating Curve**

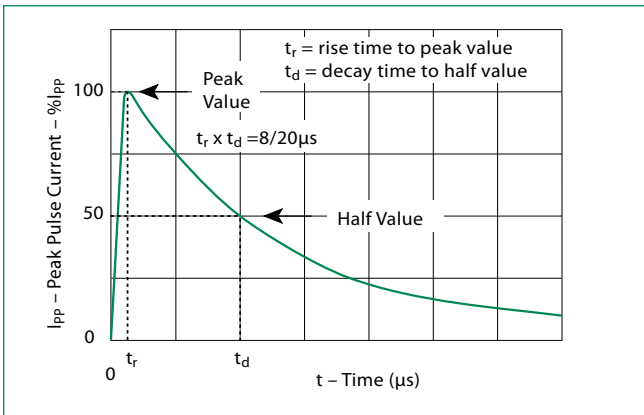


**Peak Power Derating**



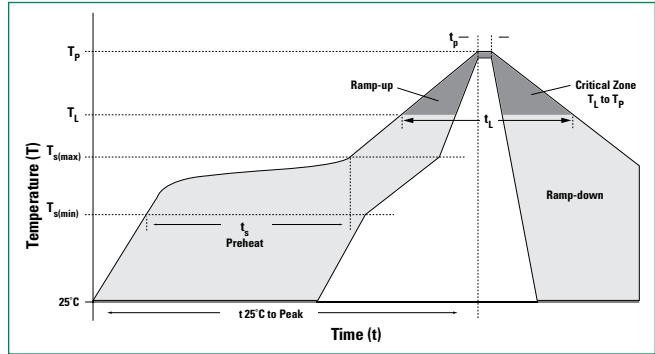
Please contact Littelfuse for reliability or FIT/MTBF data, the performance is subject to vary and depends on the end customers' application condition.

**Pulse Waveform**



**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 Max          |
| <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     |

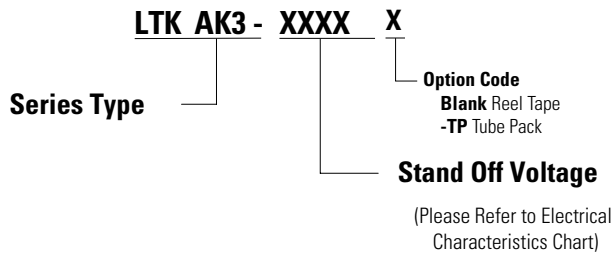
**Physical Specifications**

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

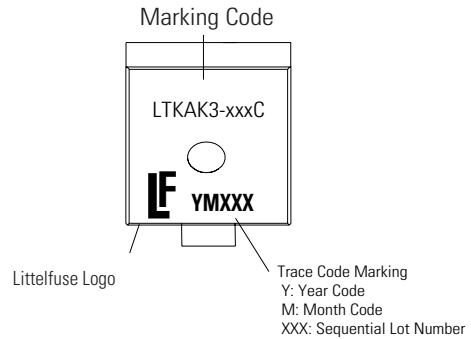
**Environmental Specifications**

|                            |                           |
|----------------------------|---------------------------|
| <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               |
| <b>Temperature cycling</b> | JESD22-A104               |

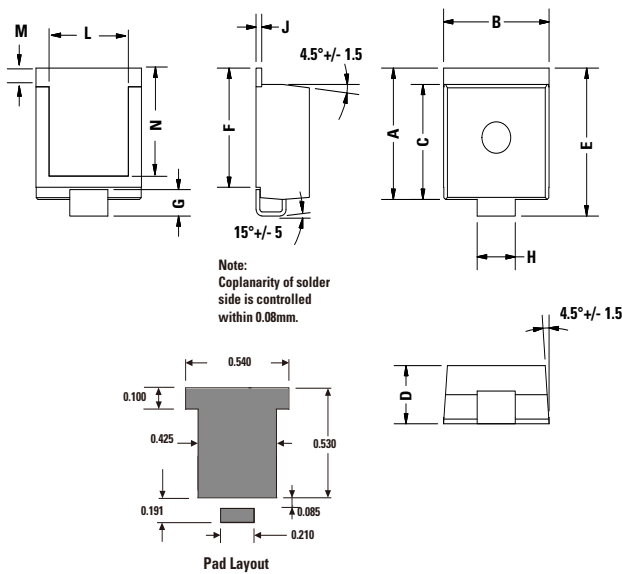
**Part Numbering System**



**Part Marking System**



**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**

