


LTKAK6 Series



Agency Approvals

| AGENCY | AGENCY FILE NUMBER |
|---|--------------------|
|  | E129662 |

Maximum Ratings and 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} | 6 | kA |

Note:

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

Description

The LTKAK6 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 LTKAK6 series can be combined in series or parallel solutions to offer various clamping levels and surge withstand options.

The LTKAK6 SMT package provides a more compact PCB layout than typical through-hole TO-218 AK TVS components.

Features

- High Power TVS designed in a surface mount and compact SMT0-218 package
- Patent pending package design
- Foldbak Technology for superior clamping characteristics
- 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
- Low clamping and slope resistance.
- Sharp breakdown voltage.
- Meet MSL level1, per J-STD-020, LF maximum peak of 260°C
- 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 (T_A=25°C unless otherwise noted)

| 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 (mA) | Max. Clamping Voltage V _C @ (I _{PP}) (Volts) | Max. Temp Coefficient of V _{BR} (%/°C) | Max. Capacitance 0V Bias 10kHz (nF) |
|--------------|---|---|---|-----------|----------------------------------|---|---|-------------------------------------|
| | | | Min Volts | Max Volts | | | | |
| LTKAK6-058C | 58 | 10 | 64 | 70 | 10 | 110 | 0.1 | 6.5 |
| LTKAK6-066C | 66 | 10 | 72 | 80 | 10 | 120 | 0.1 | 5.5 |
| LTKAK6-076C | 76 | 10 | 85 | 95 | 10 | 140 | 0.1 | 4.5 |

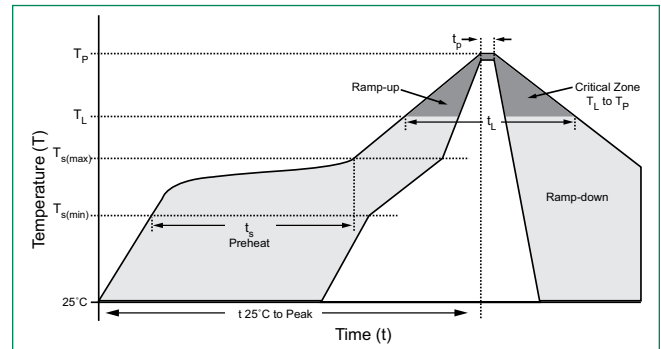
Note: Using 8/20 waveshape as defined in IEC 61000-4-5 2nd edition.

Surge Ratings

| Part Numbers | Max Peak Pulse Current (I _{PP}) | | |
|--------------|---|----------------|-----------------|
| | (80/20μS) (A) | (10/350μS) (A) | (10/1000μS) (A) |
| | Min | Min | Min |
| LTKAK6-058C | 6,000 | 900 | 430 |
| LTKAK6-066C | 6,000 | 900 | 430 |
| LTKAK6-076C | 6,000 | 900 | 430 |

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 ^{+0/-5} °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 |



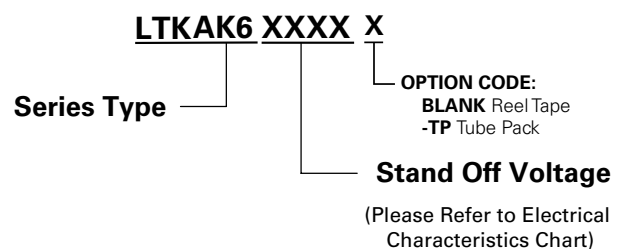
Flow/Wave Soldering (Solder Dipping)

| | |
|--------------------|------------|
| Peak Temperature : | 265°C |
| Dipping Time : | 10 seconds |
| Soldering : | 1 time |

Physical Specifications

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

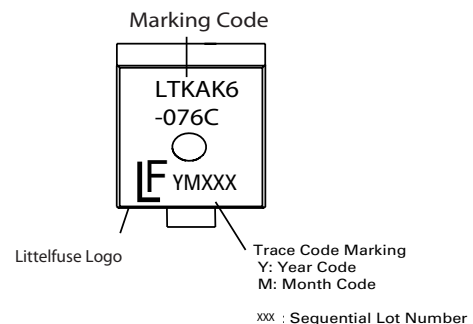
Part Numbering System



Physical Specifications

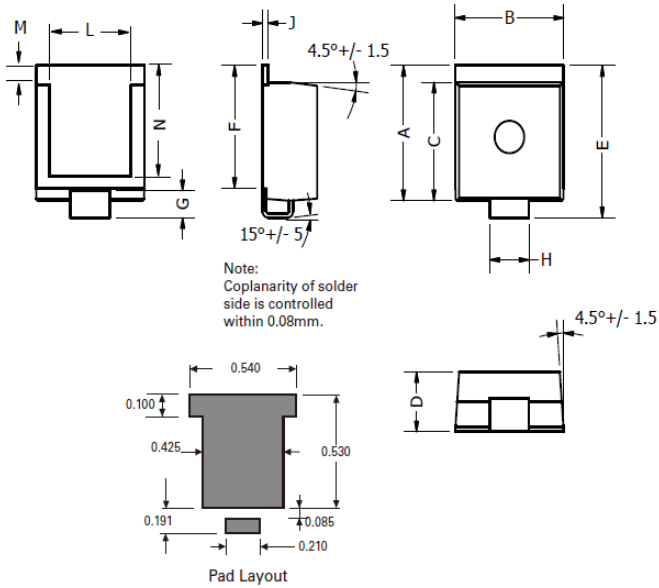
| | |
|-------------------|--------------------------|
| High Temp Storage | JESD22-A103 |
| HTRB | JESD22-A108 |
| MSL | JESDEC-J-STD020, Level 1 |
| H3TRB | JESD22-A101 |
| RSH | JESD22-B106 |

Part Marking System



Dimensions — SMT0-218

Note: Coplanarity of solder side is controlled within 0.08mm.

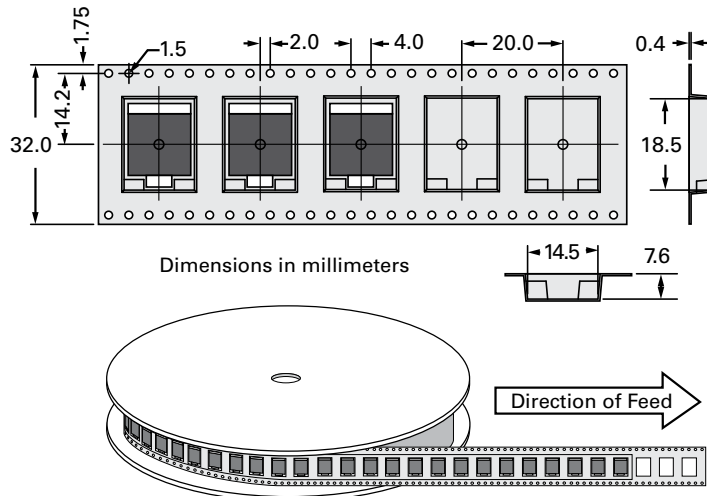


| Dimension | Inches | | Millimeters | |
|-----------|--------|-------|-------------|-------|
| | Min | Max | Min | Max |
| A | 0.621 | 0.655 | 15.78 | 16.63 |
| B | 0.529 | 0.594 | 13.43 | 15.09 |
| C | 0.544 | 0.561 | 13.83 | 14.24 |
| D | 0.273 | 0.285 | 6.94 | 7.24 |
| E | 0.702 | 0.737 | 17.82 | 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 |
|----------------|--------|-----------------------------|---------------|
| LTKAK6-xxxC | 4.34g | Tape & Reel – 32mm/13" tape | 400 |
| LTKAK6-xxxC-TP | 4.34g | Tube Pack | 100(25/Tube) |

Tape and Reel Specification



LTKAK10 Series



Agency Approvals

| AGENCY | AGENCY FILE NUMBER |
|--------|--------------------|
| | E129662 |

Maximum Ratings and 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} | 10 | kA |

Note:

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

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.

LTKAK10 in SMT0-218 package provide the enhanced quality, easy manufacturing and compact mechanical design than current AK TVS families.

Features

- Compact design having the Hi Power TVS in surface mount package
- Patent pending package design
- Foldbak Technology for superior clamping factor
- Option for pack in tube or tape and reel.
- Ideal for automatic pick and place assembly and reflow process to reduce the manufacturing cost and increase the soldering quality compared to axial leads package
- Low clamping and slope resistance.
- Sharp breakdown voltage.
- Halogen free and RoHS compliant
- 2nd level interconnect is Pb-free (IPC/JEDEC J-STD-609A.01)
- Plastic package has underwriters laboratory flammability classification 94V-0

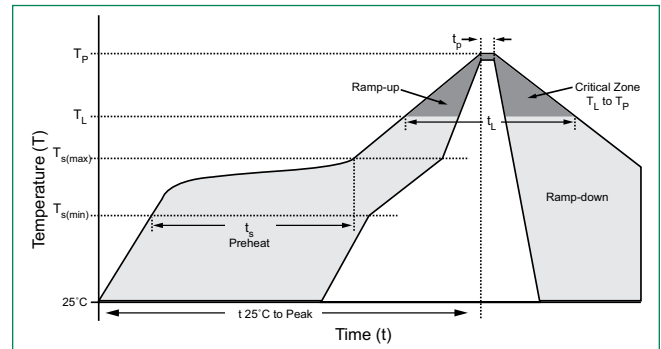
Electrical Characteristics

| 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 0 Bias 10kHz |
|--------------|---|--|---|-----------|-----------------------------|---|-----------------------|------------------------------|-----|--------------------------------|--|-------------------------------|
| | | | Min Volts | Max Volts | | (mA) | V _{CL} Volts | I _{PP} (8/20μS) (A) | | I _{PP} (10/350μS) (A) | | |
| | | | | | min | | | typ | min | typ | | |
| LTKAK10-058C | 58 | 10 | 64 | 70 | 10 | 110 | 10,000 | - | - | - | 0.1 | 8.5 |
| LTKAK10-066C | 66 | 10 | 72 | 80 | 10 | 120 | 10,000 | 13,000 | 800 | - | 0.1 | 7.5 |
| LTKAK10-076C | 76 | 10 | 85 | 95 | 10 | 140 | 10,000 | 12,000 | 450 | - | 0.1 | 6.5 |

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

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 ^{+0/-5} °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 |



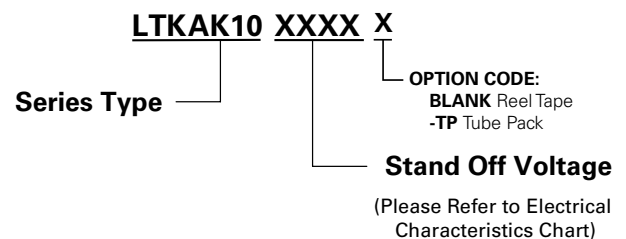
Flow/Wave Soldering (Solder Dipping)

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| Peak Temperature : | 265°C |
| Dipping Time : | 10 seconds |
| Soldering : | 1 time |

Physical Specifications

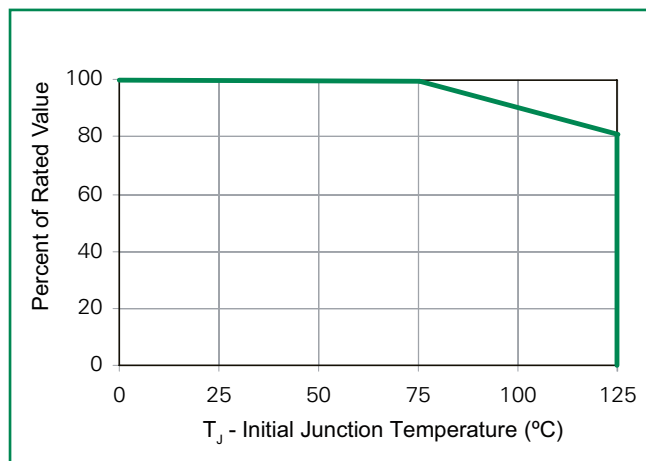
| | |
|----------|--|
| Weight | Contact manufacturer |
| Case | Epoxy encapsulated |
| Terminal | Tin plated lead, solderable per MIL-STD-202 Method 208 |

Part Numbering System



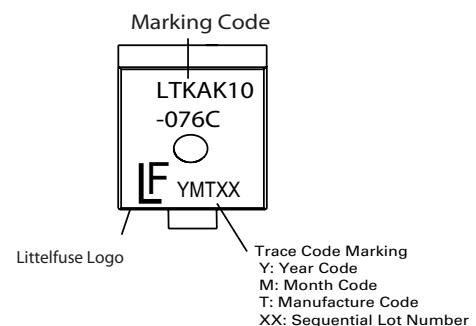
Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)

Peak Power Derating



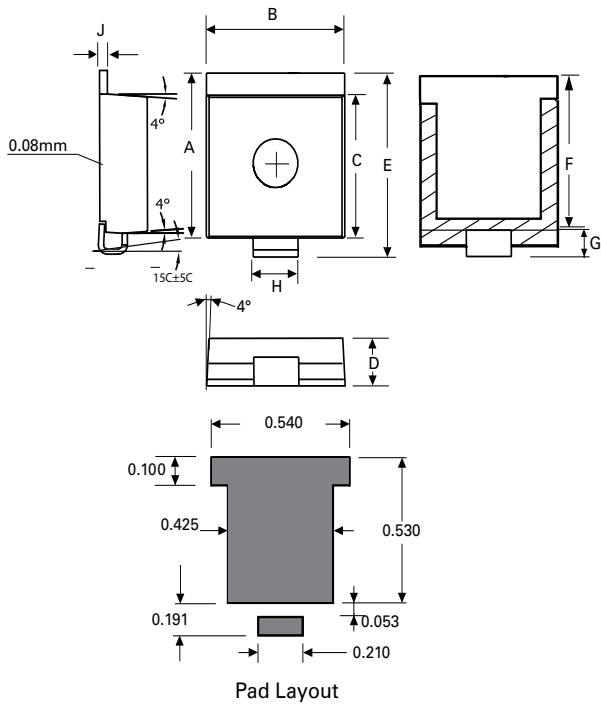
Please contact Littelfuse for reliability or FIT/MTBF data, the performance is subject to vary and depends on the end customers' application condition.

Part Marking System



Dimensions — SMT0-218 Tab

Note: Coplanarity of solder side is controlled within 0.08mm.



| 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 |
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| G | 0.074 | 0.104 | 1.88 | 2.64 |
| H | 0.193 | 0.222 | 4.89 | 5.65 |
| J | 0.028 | 0.033 | 0.72 | 0.85 |

Packaging

| Part Number | Weight | Packing Mode | Base Quantity |
|-----------------|--------|-----------------------------|---------------|
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| LTKAK10-xxxC-TP | 4.34g | Tube Pack | 100(25/Tube) |

Tape and Reel Specification

