

### AK6 Series



**NOT RECOMMENDED FOR NEW DESIGN** PCN/ECN#: LFPCN41521  
REPLACED BY: AK6-Y Series



#### Agency Approvals

| AGENCY                                                                            | AGENCY FILE NUMBER |
|-----------------------------------------------------------------------------------|--------------------|
|  | E128662            |

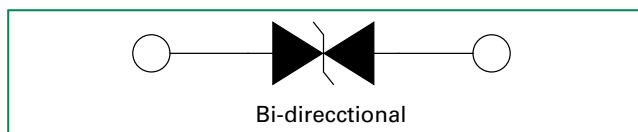
#### Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

| Parameter                            | Symbol           | Value      | Unit |
|--------------------------------------|------------------|------------|------|
| Operating Storage Temperature Range  | T <sub>STG</sub> | -55 to 150 | °C   |
| Operating Junction Temperature Range | T <sub>J</sub>   | -55 to 125 | °C   |
| Current Rating <sup>1</sup>          | I <sub>PP</sub>  | 6          | kA   |

**Note:**

1. Rated I<sub>PP</sub> measured with 8/20μS pulse.

#### Functional Diagram



#### Description

The AK6 series of high power TVS diode is specially designed for meeting severe surge test environment of both AC and DC line protection applications. It features a very fast response and ultra low clamping characteristics over traditional metal oxide (MOV) solutions. They can be connected in series and / or parallel to create a very high surge current protection solution.

#### Features

- Very low clamping voltage
- Ultra compact: less than one-tenth the size of traditional discrete solutions
- Sharp breakdown voltage
- Low slope resistance
- Bi-directional
- Foldbak technology for superior clamping factor
- Symmetric in leads width for easier soldering during assembly.
- IEC-61000-4-2 ESD 15kV(Air), 8kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2
- EFT protection of data lines in accordance with IEC 61000-4-4
- Halogen-free
- RoHS compliant
- Glass passivated junction
- Pb-free E4 means 2nd level interconnect is Pb-free and the terminal finish material is silver

#### Additional Information



Datasheet



Resources



Samples

| Part Numbers | Part Marking | Standoff Voltage (V <sub>SO</sub> ) Volts | Max. Reverse Leakage (I <sub>R</sub> ) @ V <sub>SO</sub> μA | Typical I <sub>R</sub> @ 85°C (μA) | Reverse Breakdown Voltage (V <sub>BR</sub> ) @ I <sub>T</sub> |           | Test Current I <sub>T</sub> (mA) | Max. Clamping Voltage V <sub>CL</sub> @ I <sub>PP</sub> Peak Pulse Current (I <sub>PP</sub> ) (Note 1) |                      | Max. Temp Coefficient OF V <sub>BR</sub> (%/°C) | Max. Capacitance 0 Bias 10kHz (nF) | Agency Approval  |
|--------------|--------------|-------------------------------------------|-------------------------------------------------------------|------------------------------------|---------------------------------------------------------------|-----------|----------------------------------|--------------------------------------------------------------------------------------------------------|----------------------|-------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------|
|              |              |                                           |                                                             |                                    | Min Volts                                                     | Max Volts |                                  | V <sub>CL</sub> Volts                                                                                  | I <sub>PP</sub> Amps |                                                 |                                    |                                                                                                       |
| AK6 - 030C   | 6 - 030C     | 30                                        | 10                                                          | 15                                 | 32                                                            | 37        | 10                               | 90                                                                                                     | 6,000                | 0.1                                             | 11.0                               | X                                                                                                     |
| AK6 - 058C   | 6 - 058C     | 58                                        | 10                                                          | 15                                 | 64                                                            | 70        | 10                               | 110                                                                                                    | 6,000                | 0.1                                             | 8.0                                | X                                                                                                     |
| AK6 - 066C   | 6 - 066C     | 66                                        | 10                                                          | 15                                 | 72                                                            | 80        | 10                               | 120                                                                                                    | 6,000                | 0.1                                             | 6.0                                | X                                                                                                     |
| AK6 - 076C   | 6 - 076C     | 76                                        | 10                                                          | 15                                 | 85                                                            | 95        | 10                               | 140                                                                                                    | 6,000                | 0.1                                             | 6.5                                | X                                                                                                     |
| AK6 - 170C   | 6 - 170C     | 170                                       | 10                                                          | 15                                 | 180                                                           | 220       | 10                               | 260                                                                                                    | 6,000                | 0.1                                             | 2.8                                | X                                                                                                     |
| AK6 - 190C   | 6 - 190C     | 190                                       | 10                                                          | 15                                 | 200                                                           | 245       | 10                               | 290                                                                                                    | 6,000                | 0.1                                             | 2.5                                | X                                                                                                     |
| AK6 - 240C   | 6 - 240C     | 240                                       | 10                                                          | 15                                 | 250                                                           | 285       | 10                               | 340                                                                                                    | 6,000                | 0.1                                             | 2.0                                | X                                                                                                     |
| AK6 - 380C   | 6 - 380C     | 380                                       | 10                                                          | 15                                 | 401                                                           | 443       | 10                               | 520                                                                                                    | 6,000                | 0.1                                             | 1.4                                | X                                                                                                     |
| AK6 - 430C   | 6 - 430C     | 430                                       | 10                                                          | 15                                 | 440                                                           | 490       | 10                               | 625                                                                                                    | 6,000                | 0.1                                             | 1.0                                | X                                                                                                     |

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

### Physical Specifications

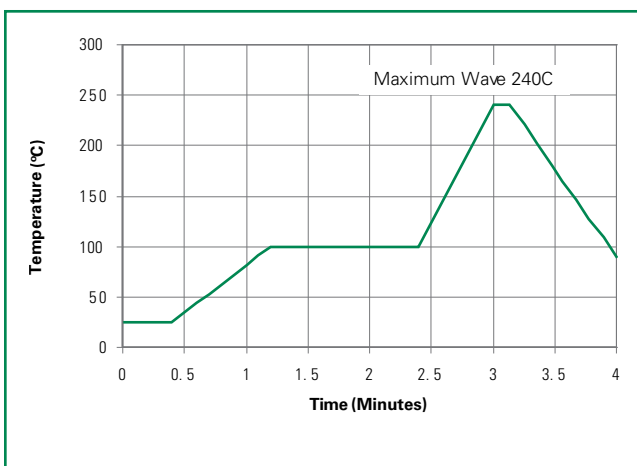
|                 |                                                             |
|-----------------|-------------------------------------------------------------|
| <b>Weight</b>   | Contact manufacturer                                        |
| <b>Case</b>     | Epoxy encapsulated                                          |
| <b>Terminal</b> | Silver plated leads, solderable per MIL-STD-750 Method 2026 |

### Flow/Wave Soldering (Solder Dipping)

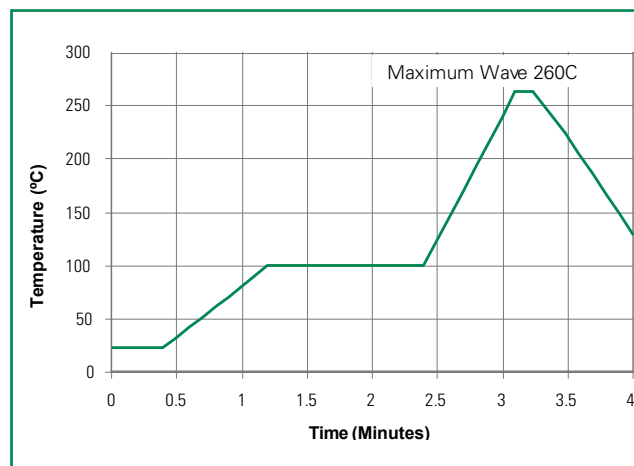
|                           |            |
|---------------------------|------------|
| <b>Peak Temperature :</b> | 265°C      |
| <b>Dipping Time :</b>     | 10 seconds |
| <b>Soldering :</b>        | 1 time     |

### Wave Solder Profile

**Figure 1 - Non Lead-free Profile**

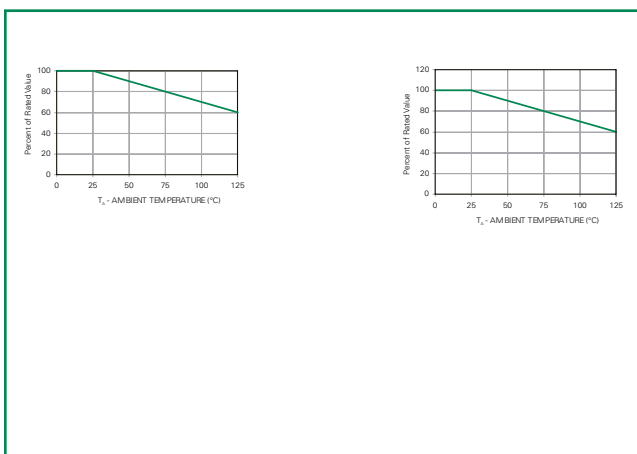


**Figure 2 - Lead-free Profile**

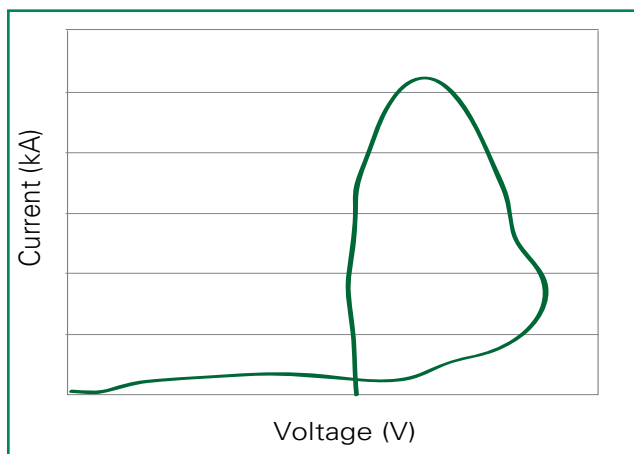


### Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$ unless otherwise noted)

**Figure 3 - Peak Power Derating**



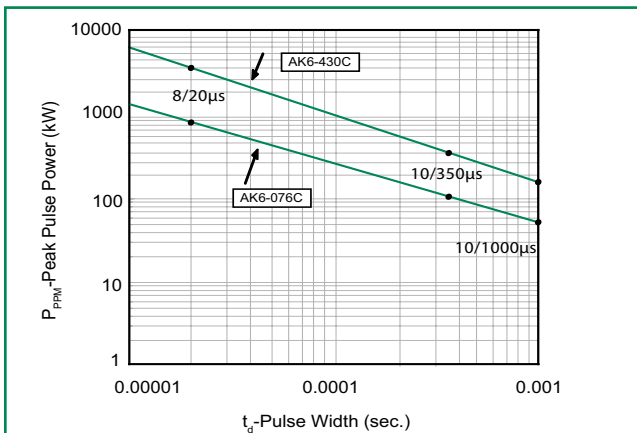
**Figure 4 - Surge Response**



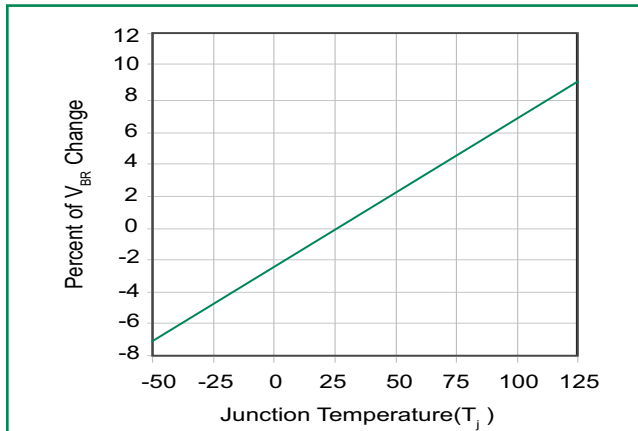
continues on next page.

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

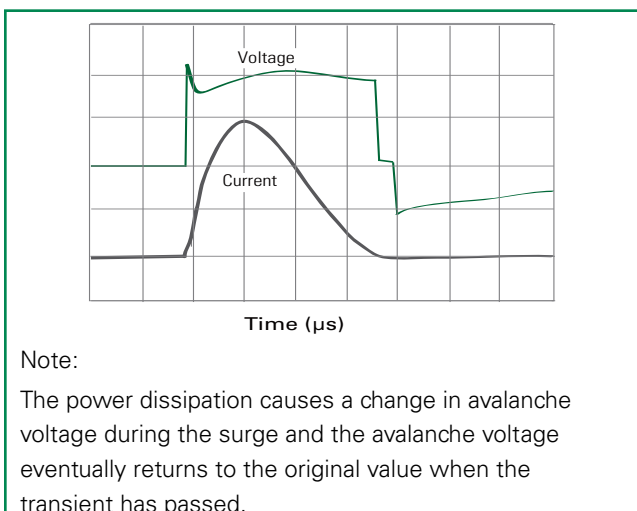
**Figure 5 - Typical Peak Pulse Power Rating Curve**



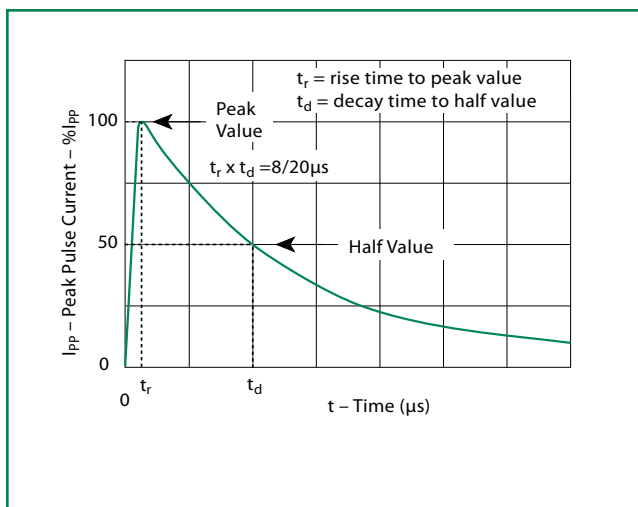
**Figure 6 - Typical  $V_{BR}$  Vs Junction Temperature**



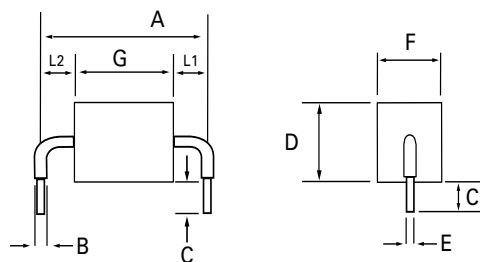
**Figure 7 - Surge Response (8/20 Surge current waveform)**



**Figure 8 - Pulse Waveform**

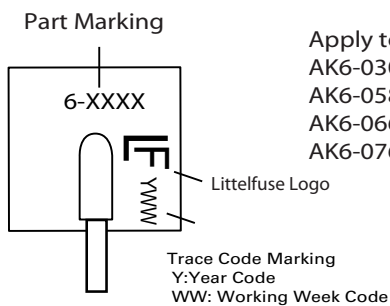


### Dimensions



| Dimensions            | Inches                                  | Millimeters    |
|-----------------------|-----------------------------------------|----------------|
| A                     | 0.950 +/- 0.040                         | 24.15 +/- 1.00 |
| B                     | 0.095 +/- 0.024                         | 2.4 +/- 0.60   |
| C                     | 0.236 +/- 0.040                         | 6.00 +/- 1.00  |
| D                     | 0.570 max.                              | 14.48 max.     |
| E                     | 0.050 +/- 0.002                         | 1.270 +/- 0.05 |
| F                     | 0.500 max.                              | 12.70 max.     |
| G - 030C              | 0.161 +/- 0.040                         | 4.10 +/- 1.00  |
| G - 058C/066C<br>076C | 0.189 +/- 0.040                         | 4.8 +/- 1.00   |
| G - 170C/190C         | 0.320 +/- 0.040                         | 8.13 +/- 1.00  |
| G - 240C              | 0.370 +/- 0.040                         | 9.4 +/- 1.00   |
| G - 380C/430C         | 0.543 +/- 0.040                         | 13.8 +/- 1.00  |
| L1/L2                 | L1= L2 tolerance +/- 0.04 inch (1.0 mm) |                |

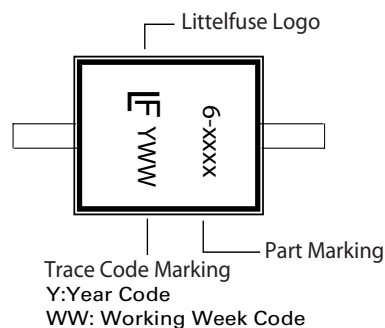
### Part Marking System



Type 1- Side View

Apply to P/N listed below:

AK6-030C  
AK6-058C  
AK6-066C  
AK6-076C

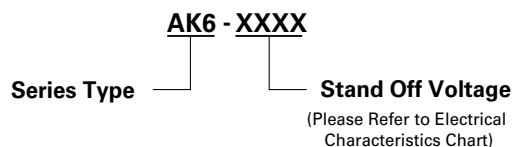


Type 2 - Top View

Apply to P/N listed below:

AK6-170C  
AK6-190C  
AK6-240C  
AK6-380C  
AK6-430C

### Part Numbering System



### Packing Options

| Part Number | Component Package | Quantity  | Packaging Option |
|-------------|-------------------|-----------|------------------|
| AK6-XXXX    | AK Package        | 56pcs/Box | Bulk             |
| AK6-XXXX-12 | AK Package        | 12pcs/Box | Bulk             |

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