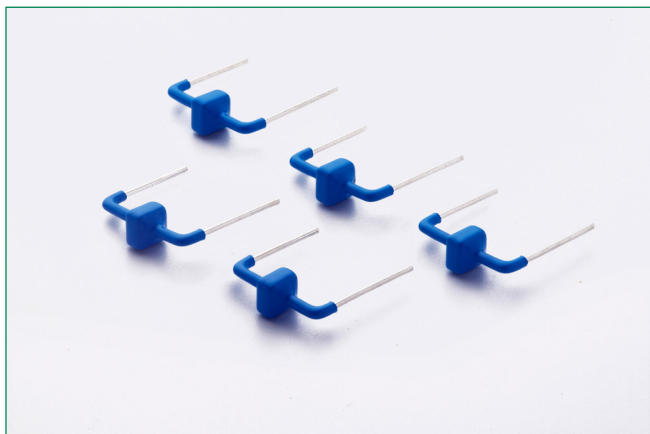


# AK3 Series

## Axial Leaded – 3kA



### Additional Information



Resources



Accessories



Samples

### Description

The AK3 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 varistor (MOV) solutions. They can be connected in series and / or parallel to create a very high surge current protection solution.

### Features & Benefits

- 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

### Maximum Ratings and Thermal Characteristics

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

Parameter	Symbol	Value	Unit
Operating Storage Temperature Range	$T_{STG}$	-55 to 150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to 125	$^\circ\text{C}$
Current Rating <sup>1</sup>	$I_{PP}$	3	kA

#### Note:

1. Rated  $I_{PP}$  measured with 8/20 $\mu\text{s}$  pulse.

### Agency Approvals

Agency	Agency File Number
	E128662

### Functional Diagram



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

Part Numbers	Part Marking	Standoff Voltage ( $V_{SO}$ ) Volts	Max. Reverse Leakage ( $I_R$ ) @ $V_{SO}$ $\mu\text{A}$	Typical $I_R$ @ $85^\circ\text{C}$ ( $\mu\text{A}$ )	Reverse Breakdown Voltage ( $V_{BR}$ ) @ $T_J$		Test Current $I_T$ (mA)	Max. Clamping Voltage $V_{CL}$ @ $I_{PP}$ Peak Pulse Current ( $I_{PP}$ ) (Note 1)		Max. Temp Coefficient OF $V_{BR}$ ( $^\circ\text{C}$ )	Max. Capacitance 0 Bias 10kHz (nF)	Agency Approval
					Min Volts	Max Volts		$V_{CL}$ Volts	$I_{PP}$ Amps			
AK3 - 015C	3 - 015C	15	10	15	16	19	10	28	3,000	0.1	12.0	X
AK3 - 030C	3 - 030C	30	10	15	32	37	10	90	3,000	0.1	11.0	X
AK3 - 038C	3 - 038C	38	10	15	40	46	10	95	3,000	0.1	10.0	-
AK3 - 058C	3 - 058C	58	10	15	64	70	10	110	3,000	0.1	6.0	X
AK3 - 066C	3 - 066C	66	10	15	72	80	10	120	3,000	0.1	6.0	X
AK3 - 076C	3 - 076C	76	10	15	85	95	10	140	3,000	0.1	6.0	X
AK3 - 150C	3 - 150C	150	10	15	158	194	10	230	3,000	0.1	2.6	X
AK3 - 170C	3 - 170C	170	10	15	179	220	10	260	3,000	0.1	2.4	X
AK3 - 190C	3 - 190C	190	10	15	200	245	10	290	3,000	0.1	2.4	X
AK3 - 208C	3 - 208C	208	10	15	223	246	10	306	3,000	0.1	2.4	X
AK3 - 380C	3 - 380C	380	10	15	401	443	10	520	3,000	0.1	2.0	X
AK3 - 430C	3 - 430C	430	10	15	440	490	10	625	3,000	0.1	2.0	X

Note: 1. Using 8/20 $\mu\text{s}$  wave shape as defined in IEC 61000-4-5.

# AK3 Series

## Axial Leaded – 3kA

### Physical Specifications

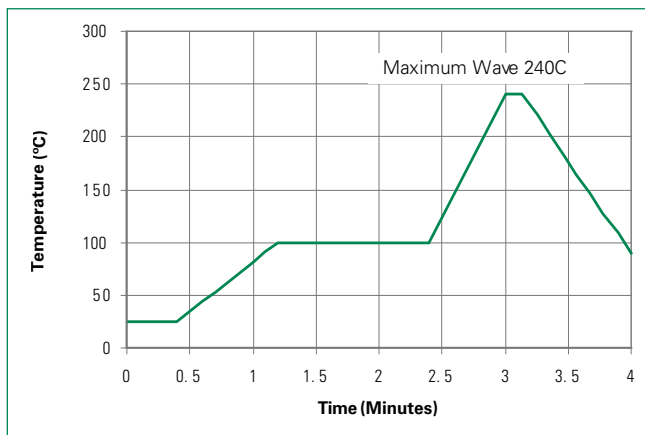
<b>Weight</b>	Contact manufacturer
<b>Case</b>	Epoxy encapsulated
<b>Terminal</b>	Silver plated leads, solderable per MIL-STD-750 Method 2026

### Flow/Wave Soldering (Solder Dipping)

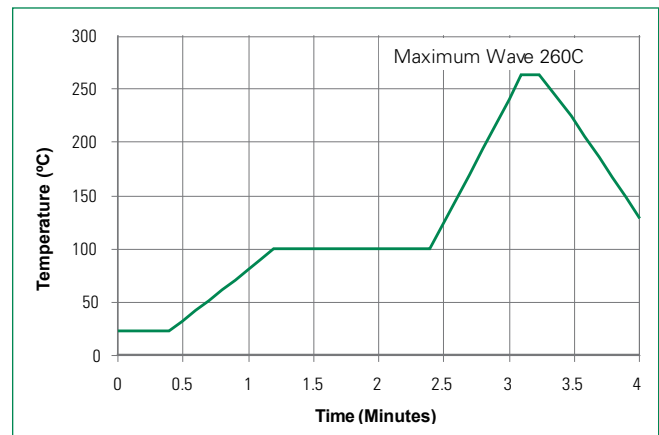
<b>Peak Temperature :</b>	265°C
<b>Dipping Time :</b>	10 seconds
<b>Soldering :</b>	1 time

### Wave Solder Profile

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

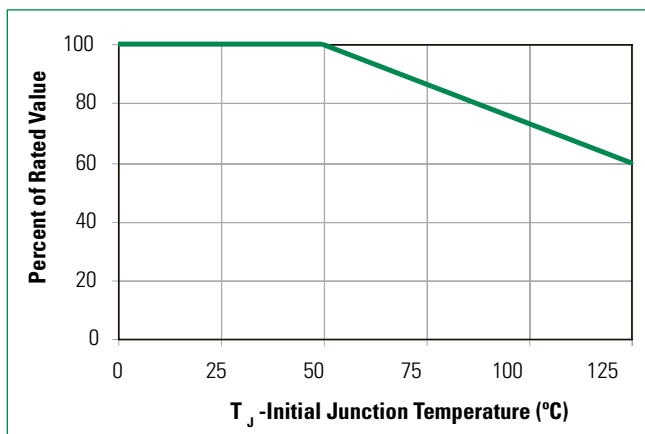


**Figure 2:**  
Lead-free Profile

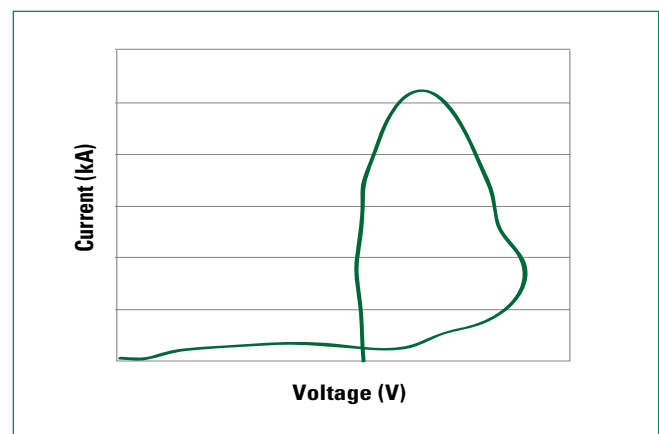


### Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$ unless otherwise noted)

**Figure 3:**  
Peak Power Derating



**Figure 4:**  
Surge Response

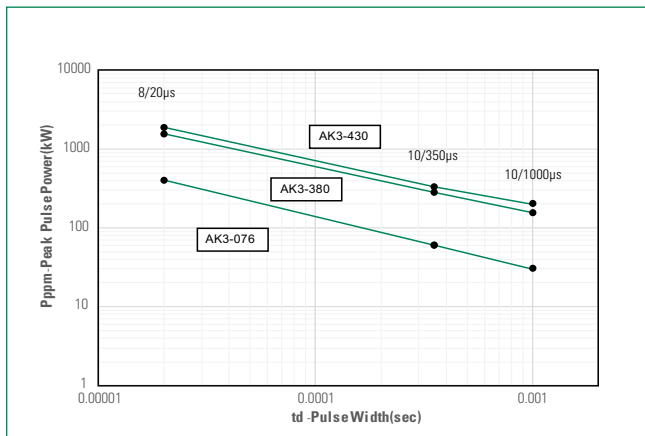


# AK3 Series

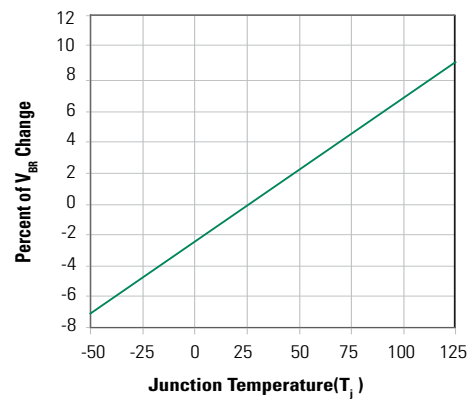
## Axial Leaded – 3kA

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

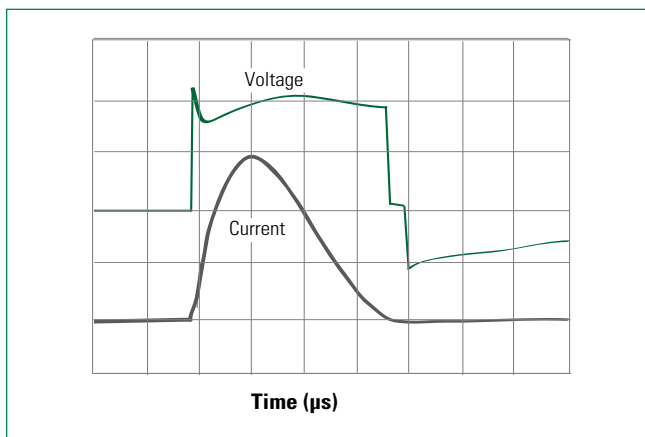
**Figure 5:**  
Typical Peak Pulse Power Rating Curve



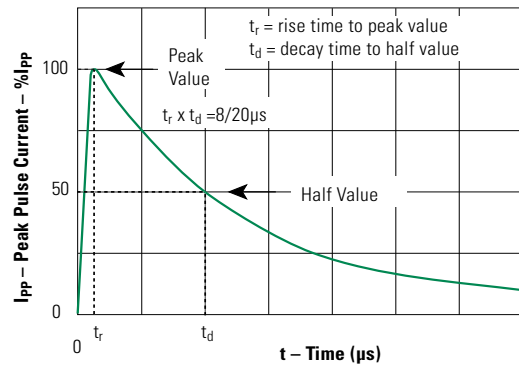
**Figure 6:**  
Typical  $V_{BR}$  Vs Junction Temperature



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



**Figure 8:**  
Pulse Waveform

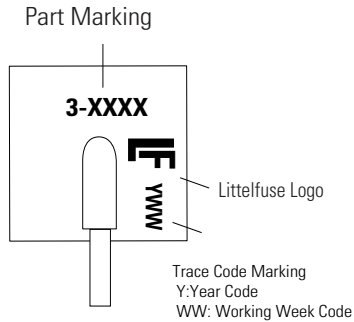


**Note:** The power dissipation causes a change in avalanche voltage during the surge and the avalanche voltage eventually returns to the original value when the transient has passed.

# AK3 Series

## Axial Leaded – 3kA

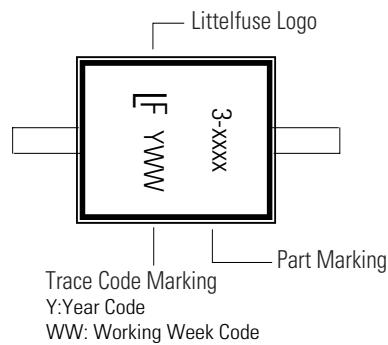
### Part Marking System



Apply to P/N listed below:

AK3-015C  
AK3-030C  
AK3-038C  
AK3-058C  
AK3-066C  
AK3-076C

**Type 1- Side View**

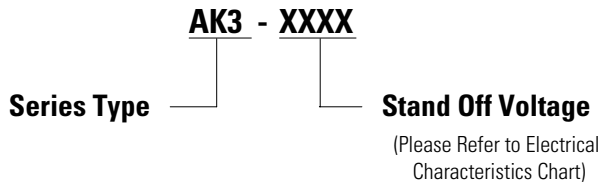


Apply to P/N listed below:

AK3-150C  
AK3-170C  
AK3-190C  
AK3-208C  
AK3-380C  
AK3-430C

**Type 2 - Top View**

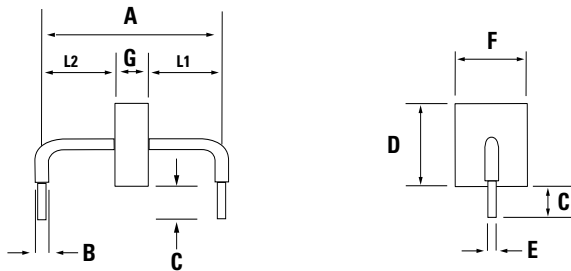
### Part Numbering System



### Packing Options

Part Number	Component Package	Quantity	Packaging Option
AK3-XXXX	AK Package	56pcs/Box	Bulk
AK3-XXXX-12	AK Package	12pcs/Box	Bulk

### Dimensions



Dimensions	Inches	Millimeters
<b>A</b>	0.951 +/- 0.040	24.15 +/- 1.00
<b>B</b>	0.094 +/- 0.024	2.40 +/- 0.60
<b>C</b>	0.236 +/- 0.039	6.00 +/- 1.00
<b>C</b>	-208C 0.145 +/- 0.040	3.68 +/- 1.00
<b>D</b>	0.433 max.	11.0 max.
<b>E</b>	0.050 +/- 0.002	1.27 +/- 0.05
<b>F</b>	0.374 max.	9.50 max.
<b>G</b>	-015C 0.093 +/- 0.039	2.36 +/- 1.00
	-030C/-038C/-066C 0.130 +/- 0.047	3.30 +/- 1.20
	-058C/-076C 0.168 +/- 0.047	4.27 +/- 1.20
	-150C 0.383 +/- 0.047	9.72 +/- 1.20
	-170C/-190C 0.420 +/- 0.047	10.67 +/- 1.20
	-208C 0.358 +/- 0.047	9.10 +/- 1.20
	-380C 0.547 +/- 0.047	13.90 +/- 1.20
<b>L1</b>	-430C 0.583 +/- 0.047	14.80 +/- 1.20
	-208C 0.296 +/- 0.047	7.52 +/- 1.20
<b>L1</b>	L1 = L2 tolerance +/- 0.047 inch (+/- 1.20 mm)	
<b>L2</b>	-208C	= A - (G+L1) tolerance +/- 0.047 inch (+/- 1.20 mm)
		L1 = L2 tolerance +/- 0.047 inch (+/- 1.20 mm)

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