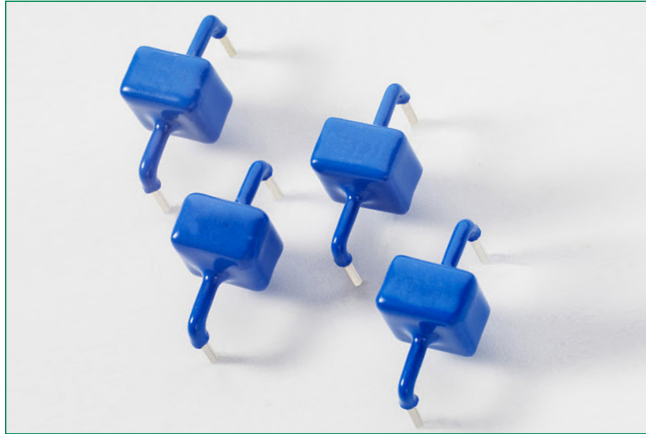


# AK10 Series

## Axial Leaded – 10kA



### Additional Information



Resources



Accessories



Samples

### Maximum Ratings and Thermal Characteristics

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

Parameter	Symbol	Value	Unit
Operating Storage Temperature Range	$T_{\text{STG}}$	-55 to 150	$^{\circ}\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to 125	$^{\circ}\text{C}$
Current Rating <sup>1</sup>	$I_{\text{PP}}$	10	kA

**Note:**

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

### Description

The AK10 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

### Agency Approvals

Agency	Agency File Number
	E128662

### Functional Diagram



Bi-directional

### Electrical Characteristics

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

Part Numbers	Part Marking	Standoff Voltage ( $V_{\text{SO}}$ ) Volts	Max. Reverse Leakage ( $I_{\text{R}}$ ) @ $V_{\text{SO}}$ $\mu\text{A}$	Typical $I_{\text{R}}$ @ $85^{\circ}\text{C}$ ( $\mu\text{A}$ )	Reverse Breakdown Voltage ( $V_{\text{BR}}$ ) @ $I_{\text{T}}$		Test Current $I_{\text{T}}$ (mA)	Max. Clamping Voltage $V_{\text{CL}}$ @ Peak Pulse Current ( $I_{\text{PP}}$ ) (Note 1)		Max. Temp Coefficient of $V_{\text{BR}}$ (%/ $^{\circ}\text{C}$ )	Max. Capacitance 0 Bias 10kHz (nF)	Agency Approval
					Min Volts	Max Volts		$V_{\text{CL}}$ Volts	$I_{\text{PP}}$ Amps			
AK10 - 015C	10 - 015C	15	10	15	16	19	10	28	10,000	0.1	40.0	-
AK10 - 030C	10 - 030C	30	10	15	32	37	10	58	10,000	0.1	20.0	X
AK10 - 033C	10 - 033C	33	10	15	36	40	10	53	10,000	0.1	20.0	X
AK10 - 058C	10 - 058C	58	10	15	64	70	10	110	10,000	0.1	10.0	X
AK10 - 066C	10 - 066C	66	10	15	72	80	10	120	10,000	0.1	10.0	X
AK10 - 076C	10 - 076C	76	10	15	85	95	10	140	10,000	0.1	6.5	X
AK10 - 170C	10 - 170C	170	10	15	180	220	10	260	10,000	0.1	4.0	X
AK10 - 190C	10 - 190C	190	10	15	200	245	10	290	10,000	0.1	3.0	X
AK10 - 220C	10 - 220C	220	10	15	230	270	10	330	10,000	0.1	2.5	X
AK10 - 240C	10 - 240C	240	10	15	250	285	10	340	10,000	0.1	2.2	X
AK10 - 270C	10 - 270C	270	10	15	282	315	10	401	10,000	0.1	2.3	X
AK10 - 380C	10 - 380C	380	10	15	401	443	10	520	10,000	0.1	2.0	X
AK10 - 430C	10 - 430C	430	10	15	440	490	10	625	10,000	0.1	1.4	X
AK10 - 530C	10 - 530C	530	10	15	560	619	10	750	10,000	0.1	1.0	X

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

# AK10 Series

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### Physical Specifications

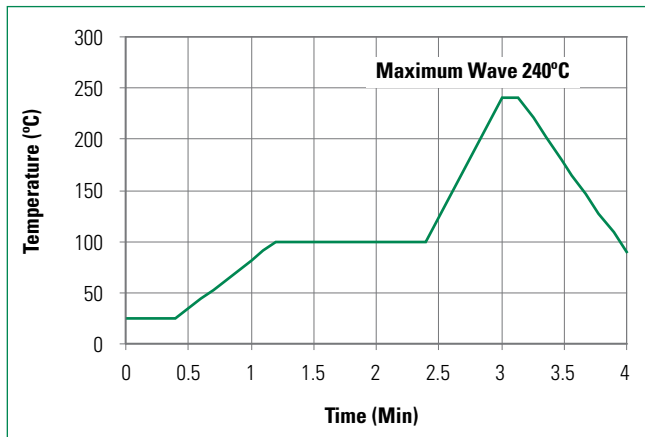
<b>Weight</b>	Contact manufacturer
<b>Case</b>	Epoxy encapsulated
<b>Terminal</b>	Silver plated leads, solderable per MIL-STD-750 Method 2026

### Flow/Wave Soldering (Solder Dipping)

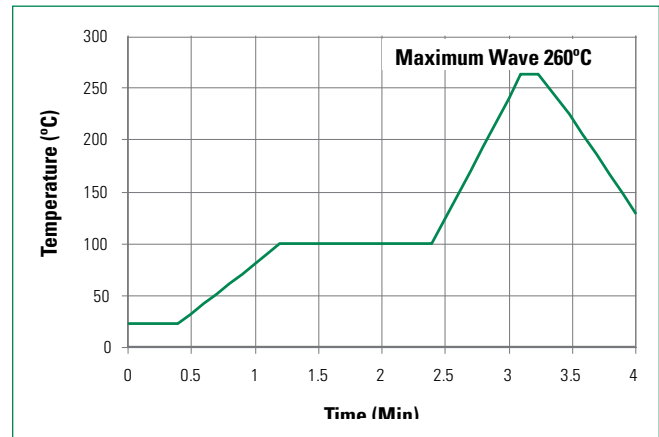
<b>Peak Temperature :</b>	265°C
<b>Dipping Time :</b>	10 seconds
<b>Soldering :</b>	1 time

### Wave Solder Profile

**Figure 1**  
Non Lead-free Profile

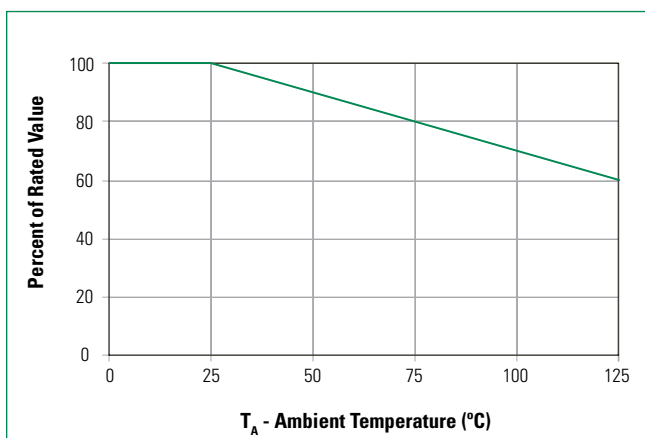


**Figure 2**  
Lead-free Profile

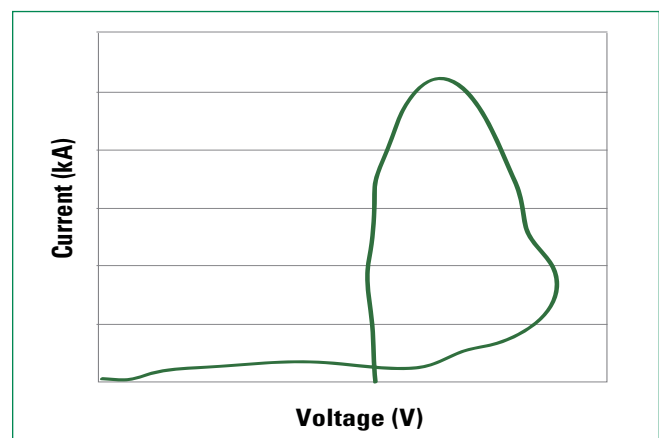


### Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

**Figure 3**  
Peak Power Derating



**Figure 4**  
Surge Response

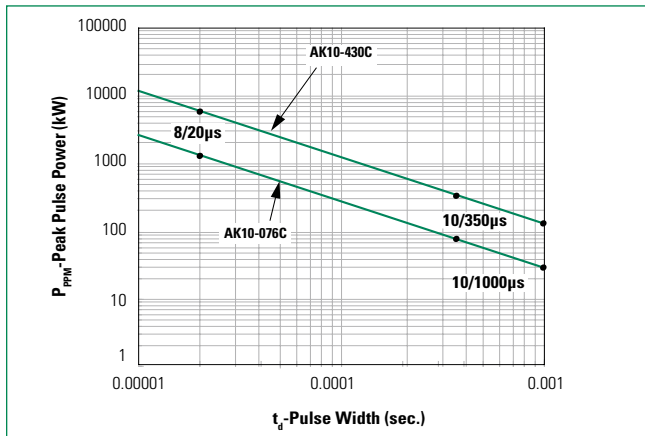


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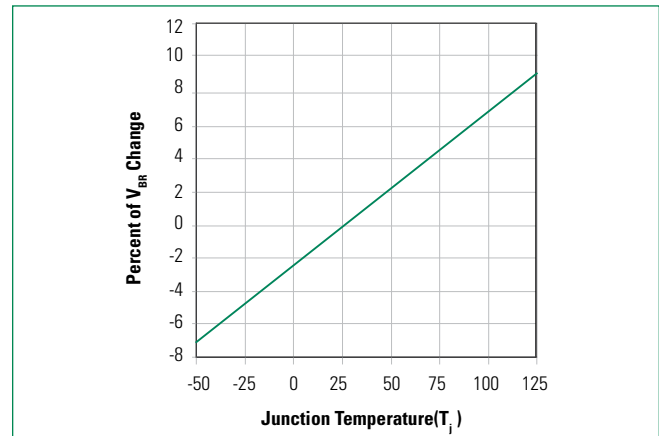
# AK10 Series

## Axial Leaded – 10kA

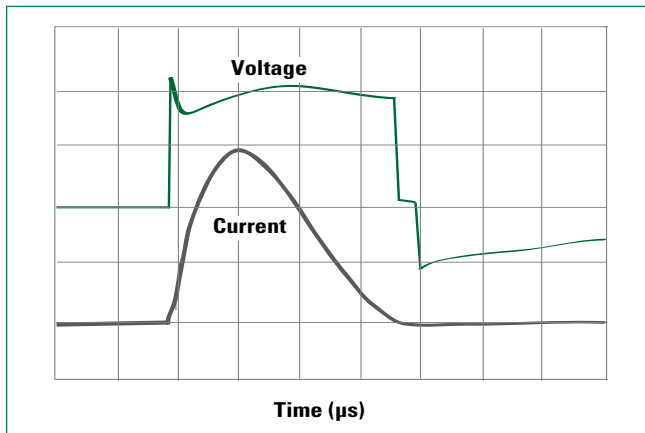
**Figure 5**  
Typical Peak Pulse Power Rating Curve



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

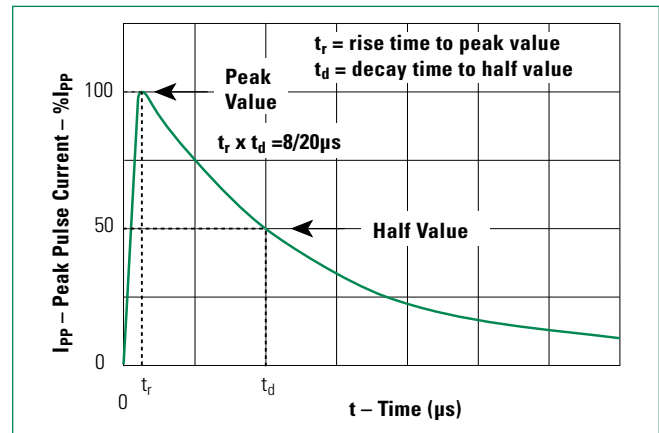


**Figure 7**  
Surge Response (8/20 Surge current waveform)

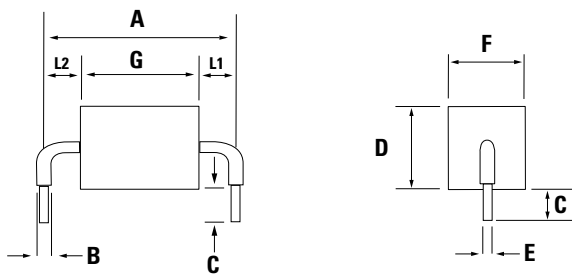


**Note:**  
The power dissipation causes a change in avalanche voltage during the surge and the avalanche voltage eventually returns to the original value when the transient has passed.

**Figure 8**  
Pulse Waveform



## Dimensions

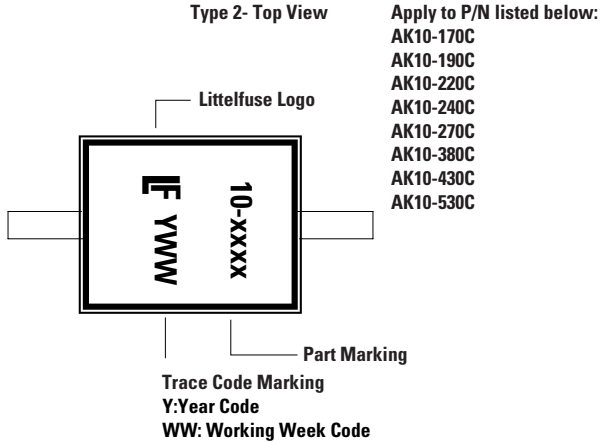
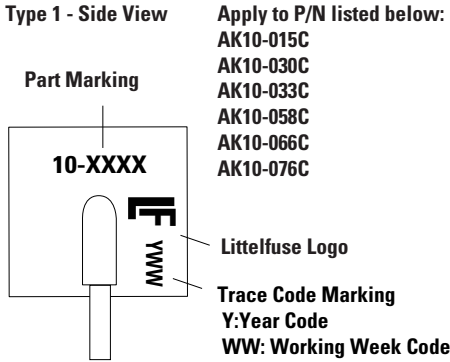


Dimensions	Inches	Millimeters
A	0.950 +/- 0.04	24.15 +/- 1.00
A - 530C	1.370 +/- 0.08	34.70 +/- 2.00
B	0.095 +/- 0.024	2.4 +/- 0.60
C	0.236 +/- 0.04	6.00 +/- 1.00
D	0.570 max.	14.48 max.
E	0.050 +/- 0.002	1.270 +/- 0.05
F	0.500 max.	12.70 max.
G - 015C	0.142 +/- 0.04	3.60 +/- 1.00
G-030C/033C	0.167 +/- 0.04	4.23 +/- 1.00
G - 058C/066C/076C	0.200 +/- 0.04	5.08 +/- 1.00
G - 170C/190C	0.362 +/- 0.04	9.2 +/- 1.00
G-220C	0.39 +/- 0.04	9.9 +/- 1.00
G-240C/270C	0.420 +/- 0.04	10.67 +/- 1.00
G - 380C/430C	0.650 +/- 0.04	16.50 +/- 1.00
G - 530C	1.060 +/- 0.06	27.00 +/- 1.50
L1/L2	L1= L2 tolerance +/- 0.04 inch (1.0 mm)	

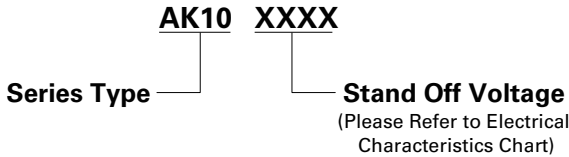
# AK10 Series

Axial Leaded – 10kA

## Part Marking System



## Part Numbering System



## Packing Options

Part Number	Component Package	Quantity	Packaging Option
AK10XXXX	AK Package	56pcs/Box	Bulk
AK10-XXXX-12	AK Package	12pcs/Box	Bulk

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