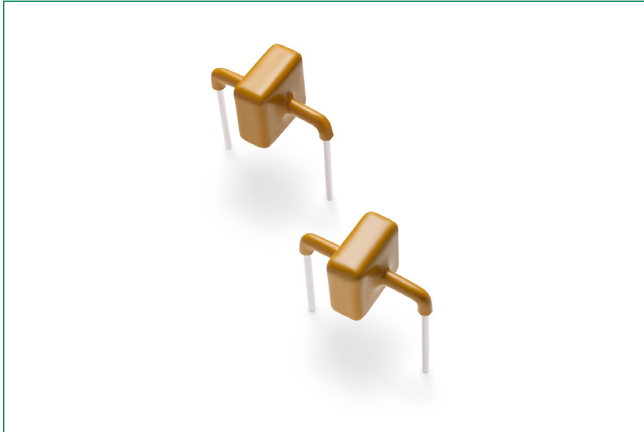


# AK1-Y Series

## Axial Leaded – 1kA



### Agency Recognitions

Agency	Agency File Number
	E128662

### Maximum Ratings and Thermal Characteristics

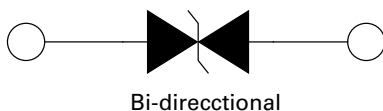
( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

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>	$I_{\text{PP}}$	1	kA

**Note:**

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

### Functional Diagram



## Descriptions

The AK1-Y 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 as compared to MOVs (Metal Oxide Varistors). These AK components can be connected in series and / or parallel to create a very high surge current protection solution.

## Features & Benefits

- Recognized to UL 497B as an Isolated Loop Circuit Protector
- Both reflow and wave soldering capable
- Very low clamping voltage
- Ultra compact: less than one-tenth the size of traditional discrete solutions
- Sharp breakdown voltage
- Low slope resistance
- Bi-directional
- IEC 61000-4-2 ESD 15kV(Air), 8kV (Contact)
- Symmetric in leads width for easier soldering during assembly.
- ESD protection of data lines in accordance with IEC 61000-4-2
- EFT protection of data lines in accordance with IEC 61000-4-4
- UL Recognized compound meeting flammability rating V-0
- Halogen-free and RoHS compliant
- Glass passivated junction
- Pb-free E4 means 2nd level interconnect is Pb-free and the terminal finish material is silver

### 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 $V_{\text{CL}}$ @ $I_{\text{PP}}$ 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			
AK1-076C-Y	1-076C	76	10	15	85	95	10	140	1,000	0.1	8.5	X
AK1-380C-Y	1-380C	380	10	15	401	443	10	570	1,000	0.1	2.0	X
AK1-430C-Y	1-430C	430	10	15	440	490	10	625	1,000	0.1	2.0	X

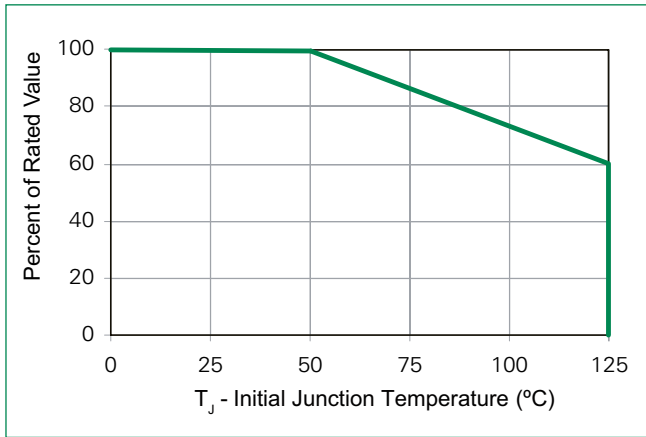
**Note:** Using 8/20 $\mu\text{s}$  wave shape as defined in IEC 61000-4-5.

# AK1-Y Series

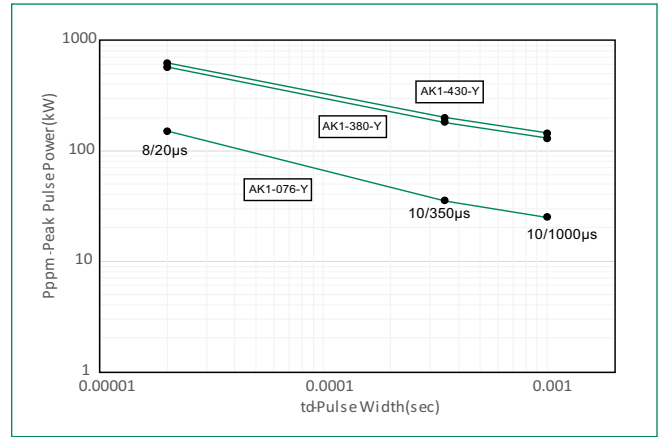
## Axial Leaded – 1kA

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

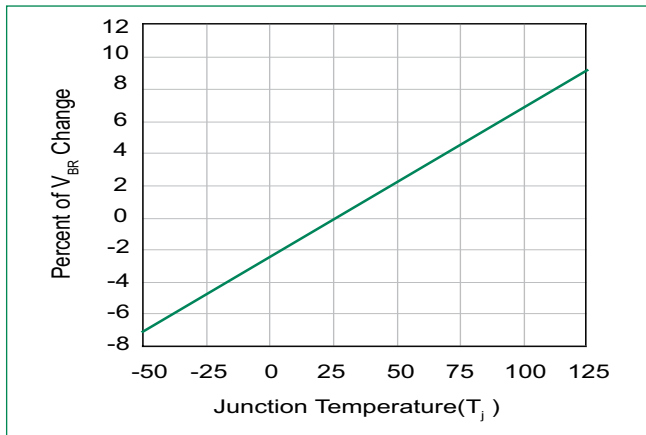
**Figure 1:**  
Peak Power Derating



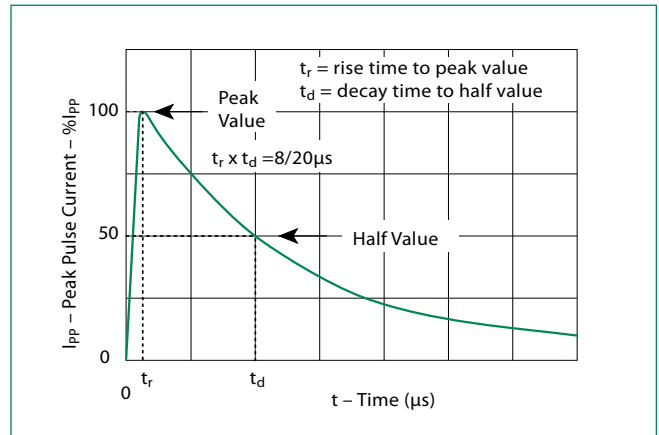
**Figure 2:**  
Typical Peak Pulse Power Rating Curve



**Figure 3:**  
Typical VBR Vs Junction Temperature



**Figure 4:**  
Pulse Waveform

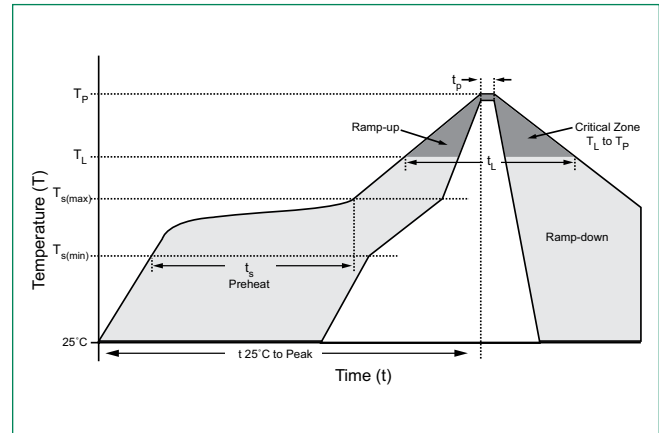


# AK1-Y Series

## Axial Leaded – 1kA

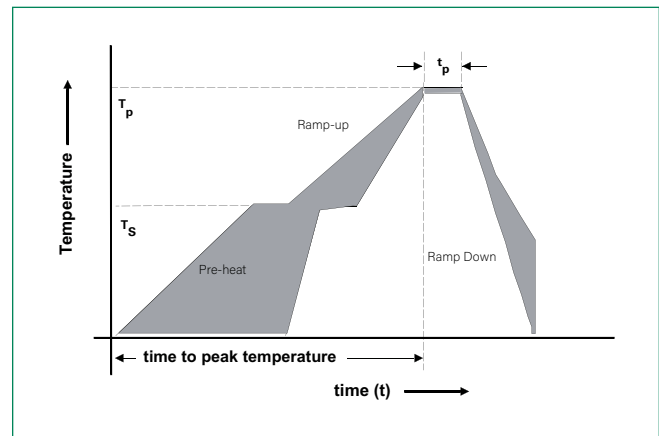
### Soldering Parameters

<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 – 120 secs
<b>Average ramp up rate (Liquidus Temp (<math>T_L</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 ( $T_L$ ) (Liquidus)	217°C
	- Time (min to max) ( $t_r$ )	60 – 150 seconds
<b>Peak Temperature (<math>T_p</math>)</b>		260 <sup>+0/-5</sup> °C
<b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>		30 seconds
<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>		260°C



### Flow Soldering (Solder Dipping)

<b>Reflow Condition</b>		Lead-free assembly
<b>Pre Heat</b>	- Temperature Min ( $T_{s(min)}$ )	140°C
	- Temperature Max ( $T_{s(max)}$ )	160°C
	- Time to Pre-Heat Temp	60 – 150 secs
<b>Average ramp up rate to Pre-Heat Temp</b>		5°C/second max
<b>Peak Temperature (<math>T_p</math>)</b>		260 <sup>+0/-5</sup> °C
<b>Average ramp up rate (pre-heat to <math>T_p</math>)</b>		5°C/second max
<b>Time within actual peak Temperature Max</b>		6 seconds
<b>Ramp-down Rate</b>		5°C/second max



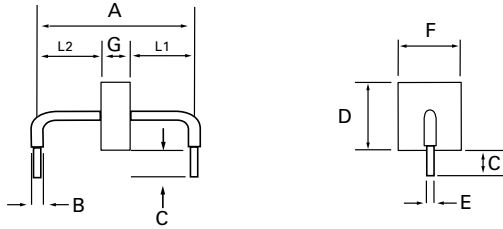
### Physical Specifications

<b>Weight</b>	Contact manufacturer
<b>Case</b>	UL Recognized compound meeting flammability rating V-0
<b>Terminal</b>	Silver plated leads, solderable per MIL-STD-750 Method 2026

# AK1-Y Series

## Axial Leaded – 1kA

### Dimensions

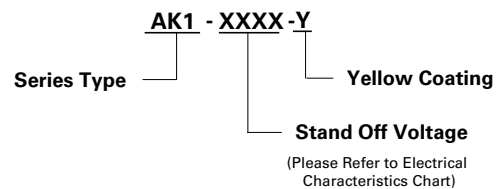


Dimensions	Inches	Millimeters
<b>A</b>	0.950 +/- 0.040	24.15 +/- 1.00
<b>B</b>	0.095 +/- 0.024	2.4 +/- 0.60
<b>C</b>	0.236 +/- 0.039	6.00 +/- 1.00
<b>D</b>	0.570 max.	14.48 max.
<b>E</b>	0.050 +/- 0.002	1.270 +/- 0.05
<b>F</b>	0.500 max.	12.70 max.
<b>G-076C-Y</b>	0.096 +/- 0.040	2.44 +/- 1.00
<b>G-380C-Y/ 430C-Y</b>	0.220 +/- 0.040	5.60 +/- 1 mm
<b>L1/L2</b>	L1= L2 tolerance +/- 0.04 inch (1.0 mm)	

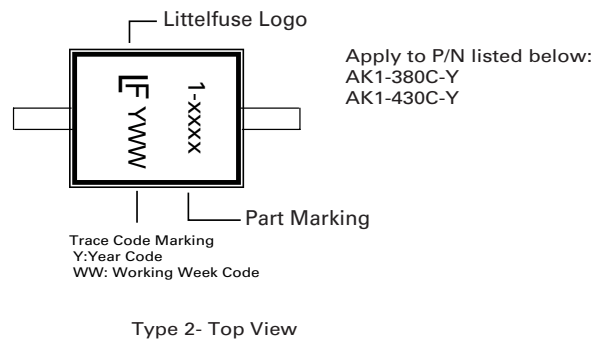
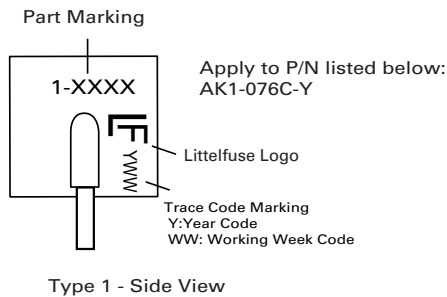
### Packing Options

Part Number	Component Package	Quantity	Packaging Option
AK1-XXXX-Y	AK Package	56pcs/Box	Bulk
AK1-XXXX-Y12	AK Package	12pcs/Box	Bulk

### Part Numbering System



### Part Marking System



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