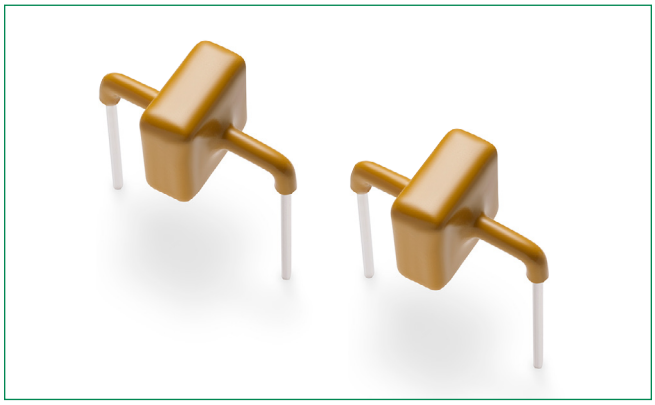
AK10-Y Series
Axial Leaded – 10kA



Agency Approvals

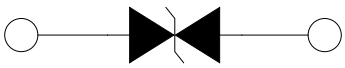
Agency	Agency File/Certificate Number
	E128662

Maximum Ratings and Thermal Characteristics
(T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 125	°C
Current Rating[1]	I_{PP}	10	kA

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

Functional Diagram



Bi-directional

Description

The AK10-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). It accomplishes this 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 maintained at a minimum magnitude, providing the best possible protection level. These AK components can be connected in series and / or parallel to create a very high surge current protection solution.

Features

- 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
- 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 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°C unless otherwise noted)

Part Numbers	Part Marking	Standoff Voltage (V_{SO}) Volts	Max. Reverse Leakage (I_R) @V_{SO} µA	Typical I_R @ 85°C (µA)	Reverse Breakdown Voltage (V_{BR}) @ I_T		Test Current I_T	Max. Clamping Voltage V_{CL} @ Peak Pulse Current (I_{PP}) (Note 1)		Max. Temp Coefficient of V_{BR}	Max. Capacitance 0 Bias 10kHz	Agency Approval
					Min Volts	Max Volts	(mA)	V_{CL} Volts	I_{PP} Amps	(%/°C)	(nF)	
AK10-015C-Y	10-015C	15	10	15	16	19	10	28	10,000	0.1	40.0	-
AK10-030C-Y	10-030C	30	10	15	32	37	10	48	10,000	0.1	20.0	X
AK10-033C-Y	10-033C	33	10	15	36	40	10	53	10,000	0.1	20.0	X
AK10-058C-Y	10-058C	58	10	15	64	70	10	110	10,000	0.1	10.0	X
AK10-066C-Y	10-066C	66	10	15	72	80	10	120	10,000	0.1	10.0	X
AK10-076C-Y	10-076C	76	10	15	85	95	10	140	10,000	0.1	6.5	X
AK10-170C-Y	10-170C	170	10	15	180	220	10	260	10,000	0.1	4.0	X
AK10-190C-Y	10-190C	190	10	15	200	245	10	290	10,000	0.1	3.0	X
AK10-220C-Y	10-220C	220	10	15	230	270	10	330	10,000	0.1	2.5	X
AK10-240C-Y	10-240C	240	10	15	250	285	10	340	10,000	0.1	2.2	X
AK10-270C-Y	10-270C	270	10	15	282	315	10	401	10,000	0.1	2.3	X
AK10-380C-Y	10-380C	380	10	15	401	443	10	520	10,000	0.1	2.0	X
AK10-430C-Y	10-430C	430	10	15	440	490	10	625	10,000	0.1	1.4	X
AK10-530C-Y	10-530C	530	10	15	560	619	10	750	10,000	0.1	1.0	X

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

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Ratings and Characteristic Curves (TA=25°C unless otherwise noted) (Continued)

Figure 1
Peak Power Derating

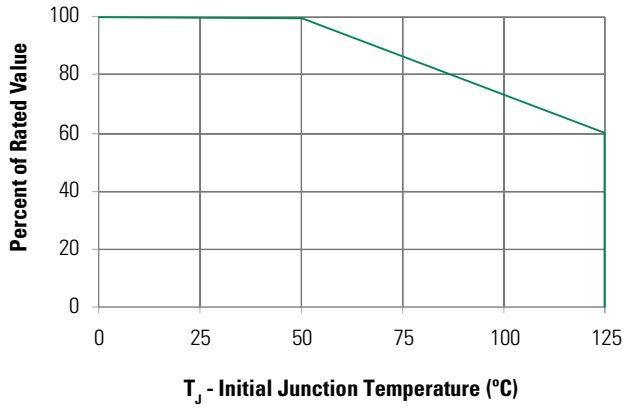


Figure 2
Pulse Waveform

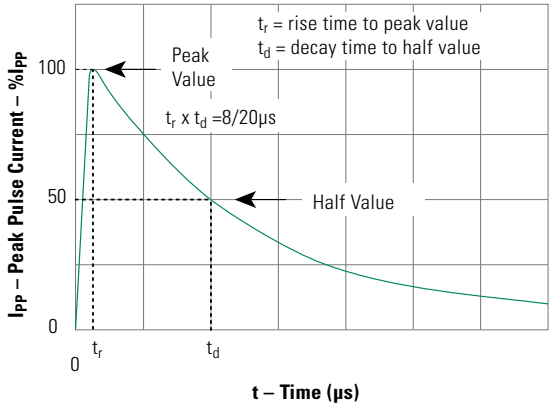


Figure 3
Typical Peak Pulse Power Rating Curve

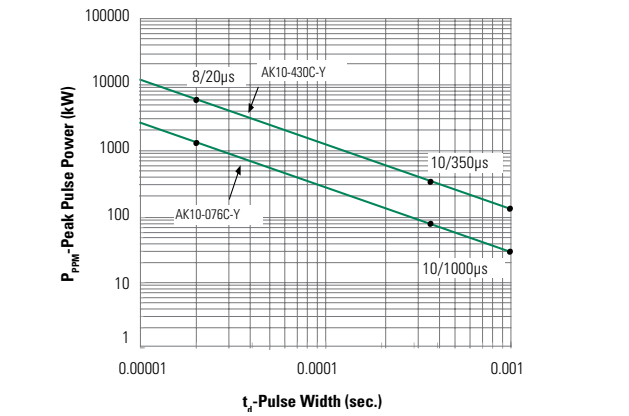


Figure 4
Typical V_{BR} Vs Junction Temperature

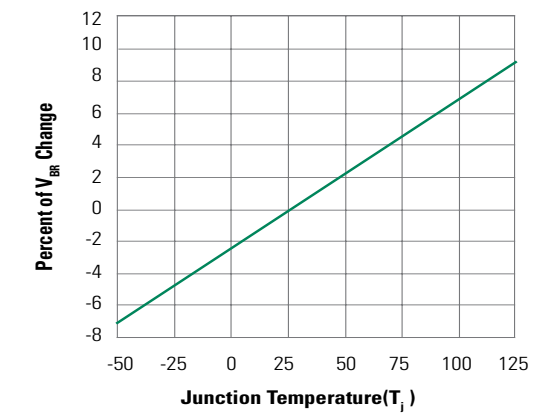
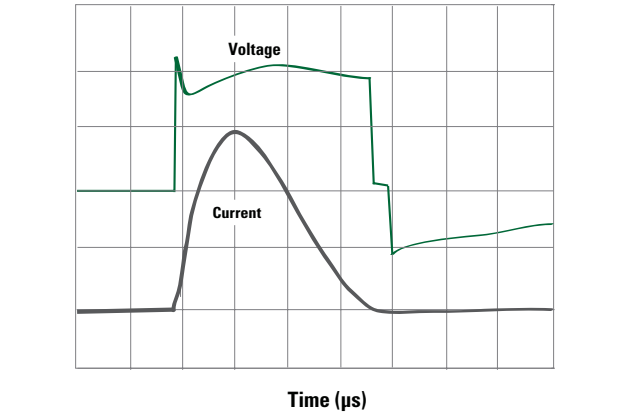


Figure 5
Surge Response (8/20 Surge current waveform)



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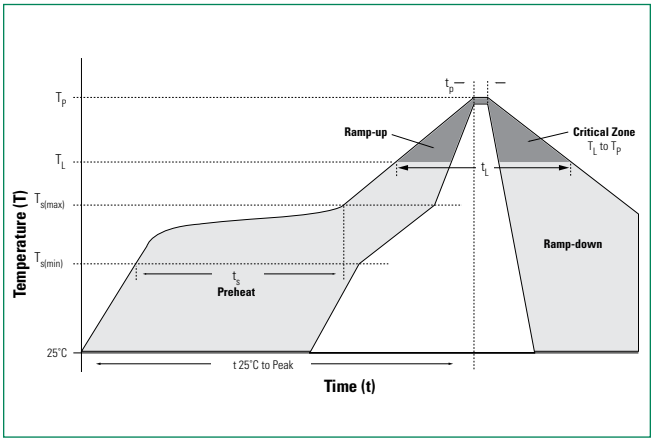
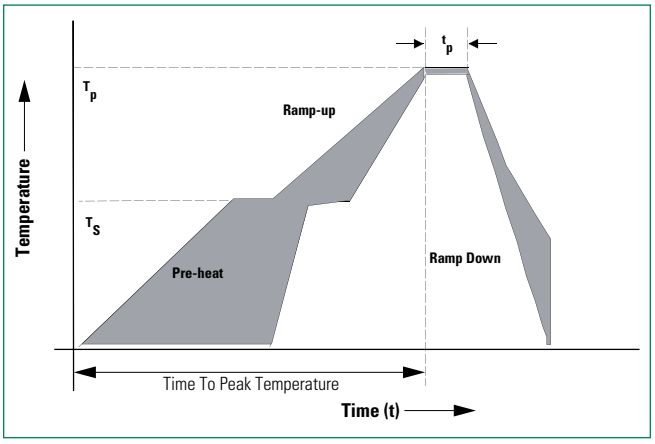
Soldering Parameters

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 – 120 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_A - Ramp-up Rate		3°C/second max
Reflow	**- Temperature (T_L) (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)		30 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 Soldering
(Solder Dipping)

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



Physical Specifications

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

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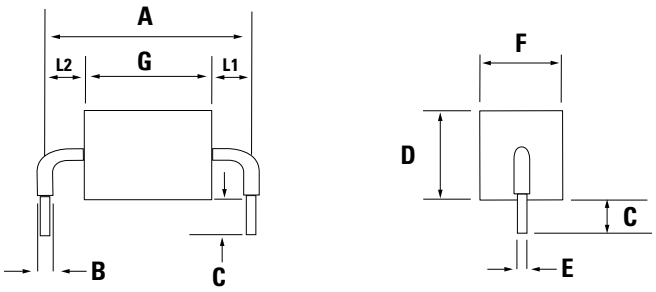
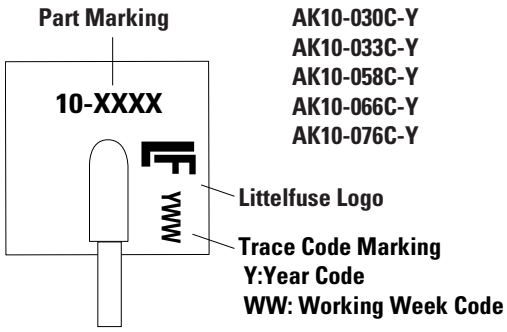
Dimensions



Dimensions	Inches	Millimeters
A	0.950 +/- 0.04	24.15 +/- 1.00
A - 530C-Y	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-Y	0.142 +/- 0.04	3.60 +/- 1.00
G - 030C-Y/ 033C-Y	0.167 +/- 0.04	4.23 +/- 1.00
G - 058C-Y/066C-Y/076C-Y	0.200 +/- 0.04	5.08 +/- 1.00
G - 170C-Y/190C-Y	0.362 +/- 0.04	9.2 +/- 1.00
G-220C-Y	0.39 +/- 0.04	9.9 +/- 1.00
G - 240C-Y/ /270C-Y	0.420 +/- 0.04	10.67 +/- 1.00
G - 380C-Y/430C-Y	0.650 +/- 0.04	16.50 +/- 1.00
G - 530C-Y	1.060 +/- 0.06	27.00 +/- 1.50
L1/L2	L1= L2 tolerance +/- 0.04 inch (1.0 mm)	

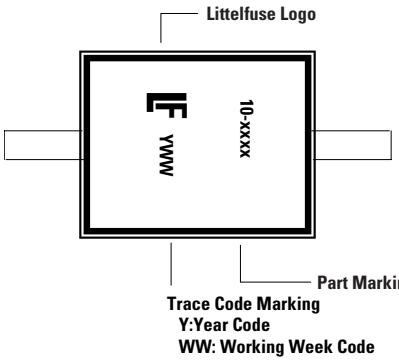
Part Marking System

Type 1 - Side View



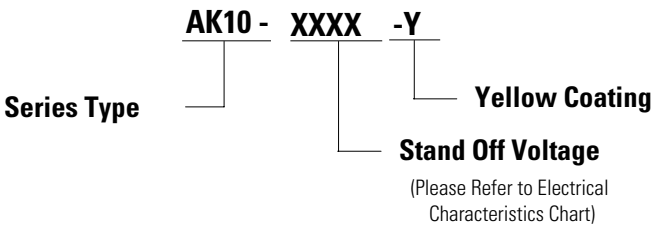
Apply to P/N listed below:
AK10-015C-Y
AK10-030C-Y
AK10-033C-Y
AK10-058C-Y
AK10-066C-Y
AK10-076C-Y

Type 2- Top View



Apply to P/N listed below:
AK10-170C-Y
AK10-190C-Y
AK10-220C-Y
AK10-240C-Y
AK10-270C-Y
AK10-380C-Y
AK10-430C-Y
AK10-530C-Y

Part Marking System



Packing Options

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

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