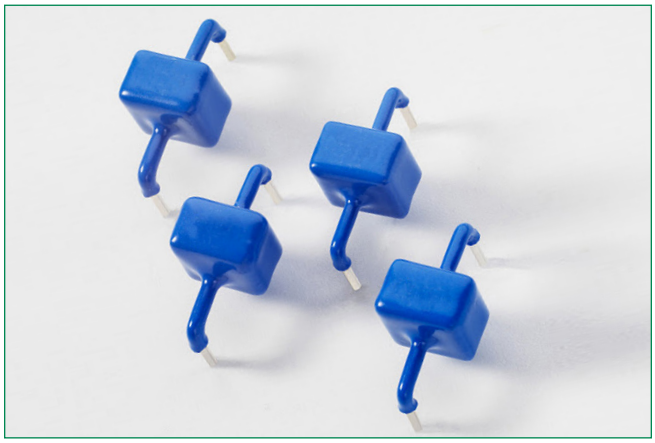
AK10 Series

Axial Leaded – 10kA



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

Additional Information

Resources | Accessories | Samples

Maximum Ratings and Thermal Characteristics

(T_A=25°C unless otherwise noted)

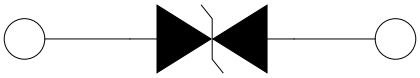
Parameter	Symbol	Value	Unit
Operating Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 125	°C
Current Rating[1]	I_{PP}	10	kA

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

Agency Approvals

Agency	Agency File Number
UL	E128662

Functional Diagram



Bi-directional

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 UL
					Min Volts	Max Volts	(mA)	V_{CL} Volts	I_{PP} Amps	(%/°C)	(nF)	
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 8/20µS wave shaped defined in IEC 61000-4-5.

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Physical Specifications

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

Flow/Wave Soldering (Solder Dipping)

Peak Temperature :	265°C
Dipping Time :	10 seconds
Soldering :	1 time

Wave Solder Profile

Figure 1
Non Lead-free Profile

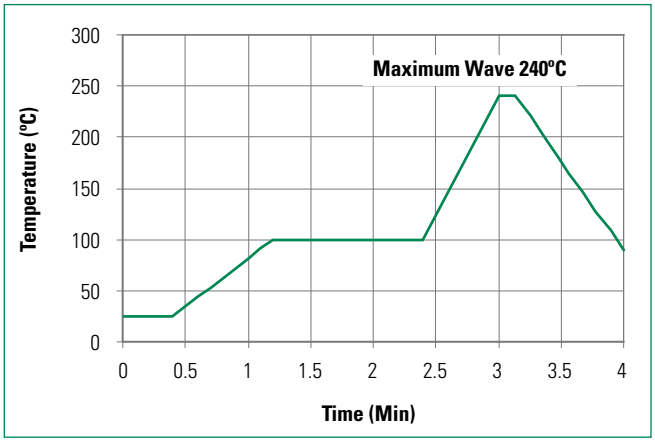
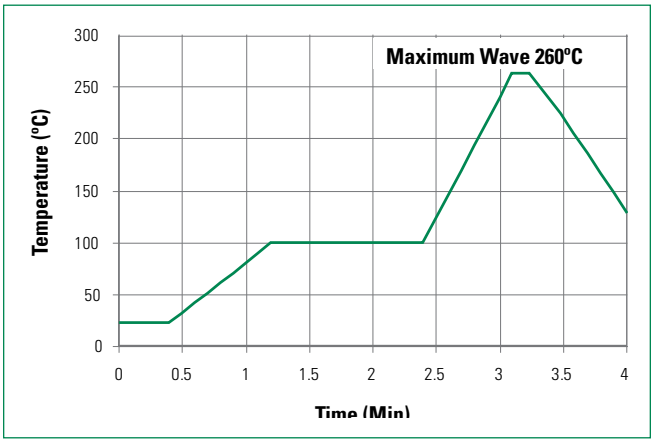


Figure 2
Lead-free Profile



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

Figure 3
Peak Power Derating

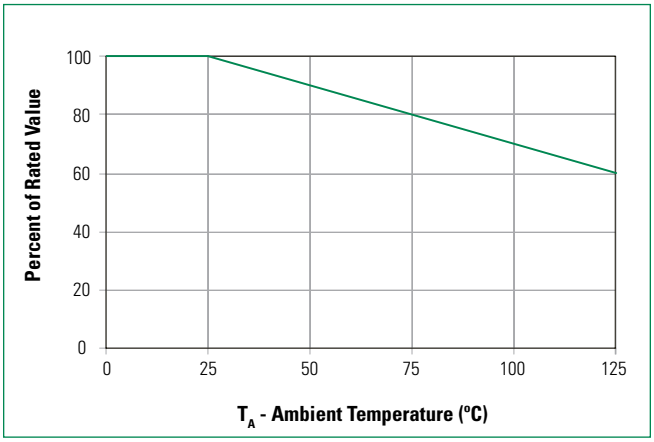


Figure 4
Surge Response

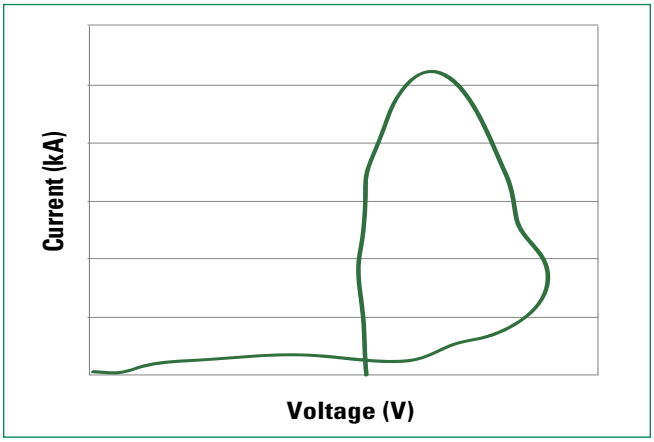


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Figure 5
Typical Peak Pulse Power Rating Curve

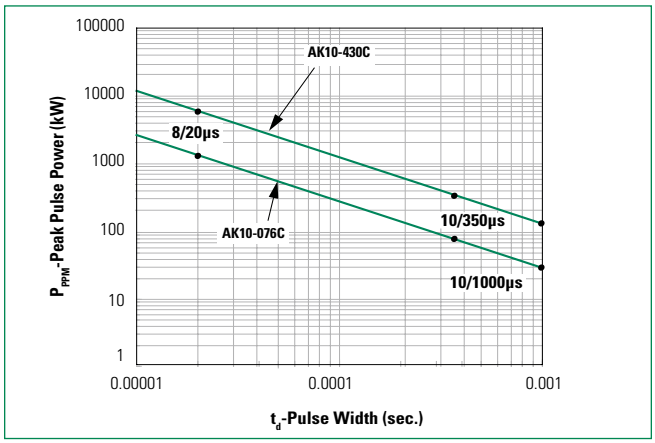


Figure 6
Typical V_{BR} Vs Junction Temperature

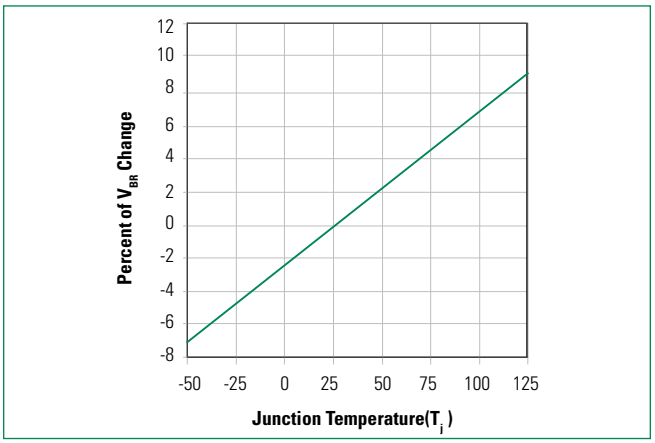


Figure 7
Surge Response (8/20 Surge current waveform)

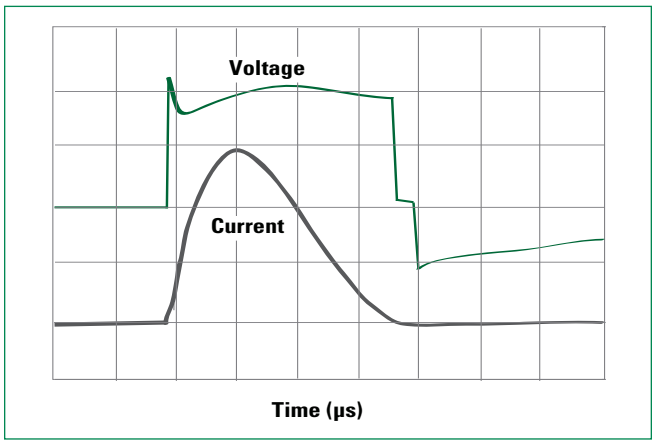
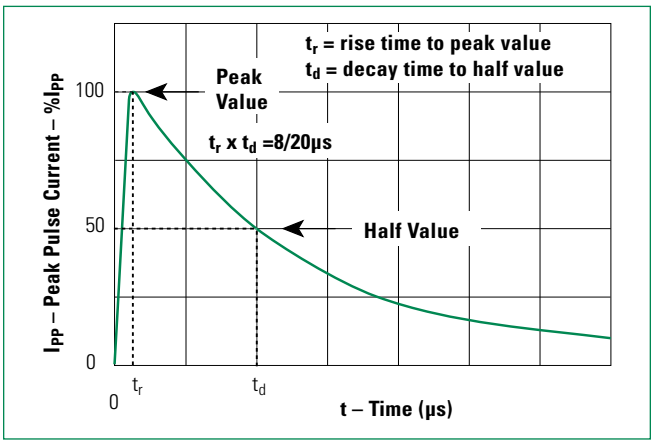
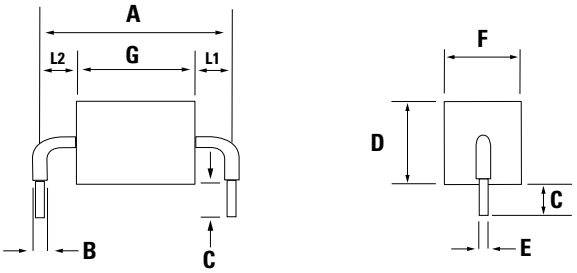


Figure 8
Pulse Waveform



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.

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)	

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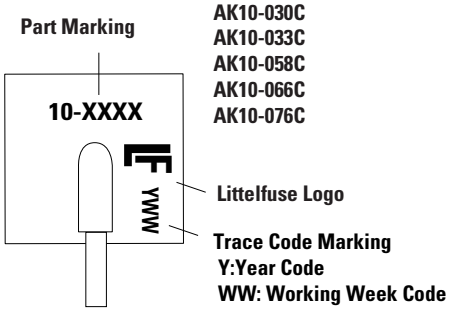
Part Marking System

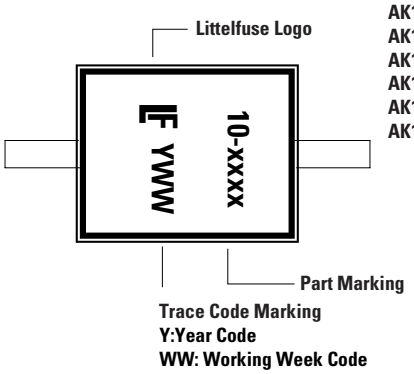
Type 1 - Side View

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



Type 2- Top View

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



Part Numbering System

AK10 XXXX

Series Type

Stand Off Voltage
(Please Refer to Electrical Characteristics Chart)

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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