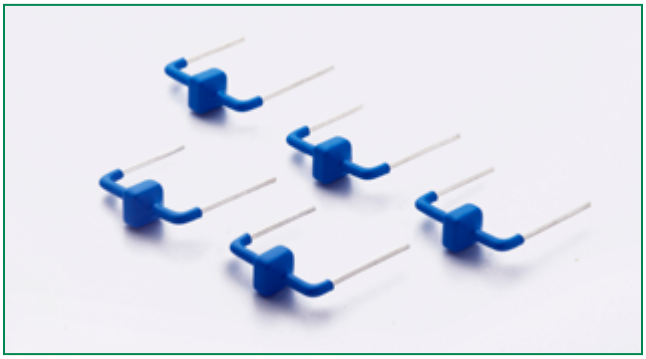
Transient Voltage Suppression Diodes

Axial Leaded – 3kA > AK3 series

Littelfuse
Expertise Applied | Answers Delivered

AK3 Series

HF RoHS



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 (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

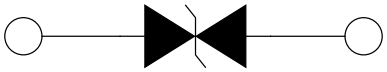
Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

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}	3	kA

Note:

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

Functional Diagram



Bi-direcctional

Additional Infomarion

Datasheet | **Resources** | **Samples**

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} @ I_{PP} 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)	
AK3 - 015C	3 - 015C	15	10	15	16	19	10	28	3,000	0.1	9.0	X
AK3 - 030C	3 - 030C	30	10	15	32	37	10	90	3,000	0.1	11.0	X
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 - 208C	3 - 208C	208	10	15	223	246	10	262	3,000	0.1	2.4	
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 8/20μS wave shape as 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

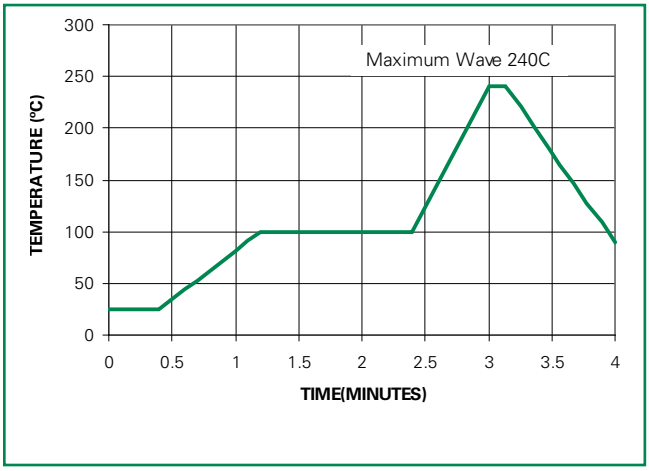
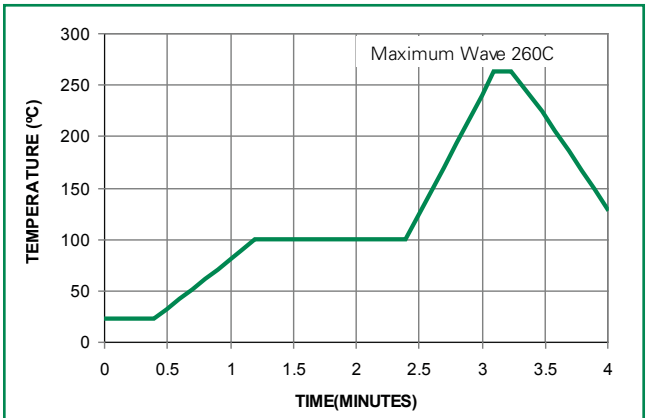


Figure 2 - Lead-free Profile



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

Figure 3 - Peak Power Derating

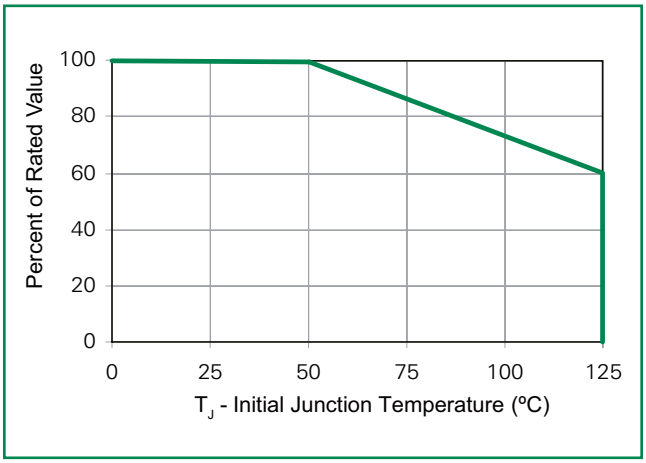
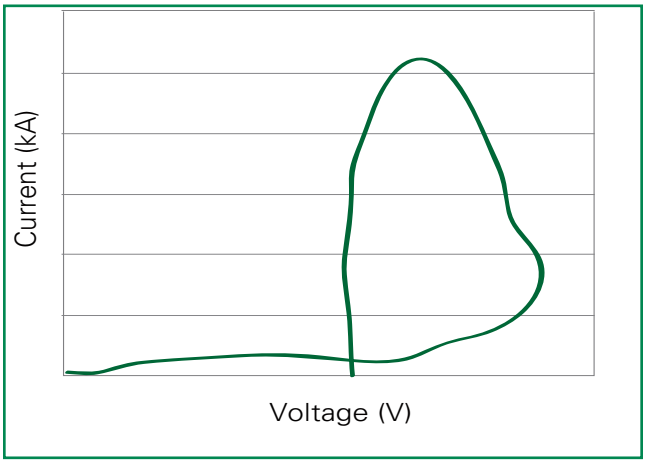


Figure 4 - Surge Response



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

Figure 5 - Typical Peak Pulse Power Rating Curve

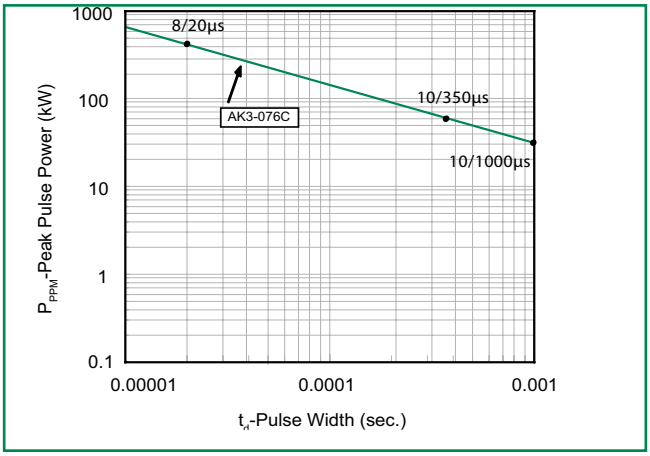


Figure 6 - Typical V_{BR} Vs Junction Temperature

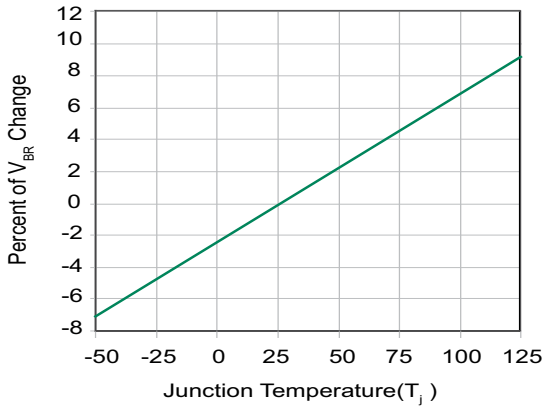
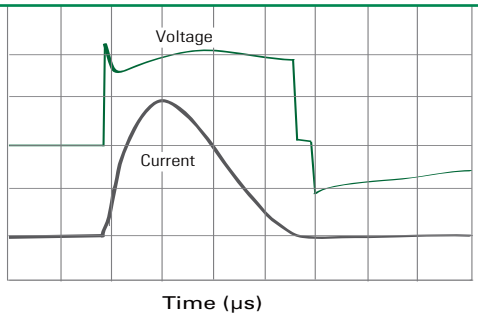


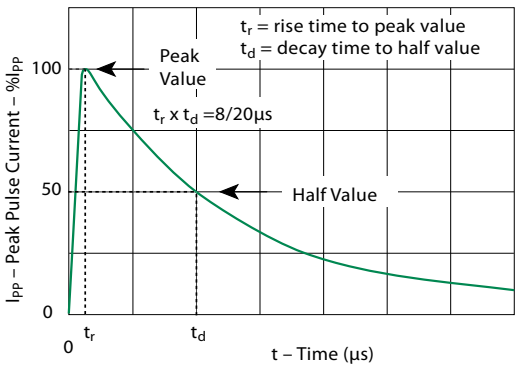
Figure 7 -Surge Response (8/20 Surge current waveform)



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



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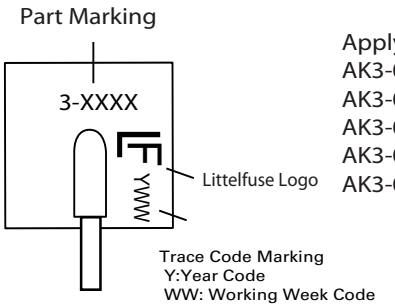
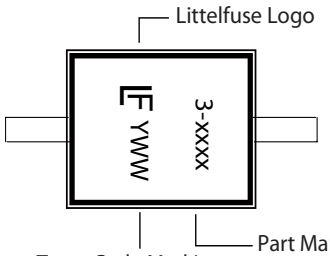
Part Marking System



Apply to P/N listed below:
AK3-015C
AK3-030C
AK3-058C
AK3-066C
AK3-076C

Type 1- Side View



Apply to P/N listed below:
AK3-150C
AK3-170C
AK3-208C
AK3-380C
AK3-430C

Type 2 - Top View

Part Numbering System

AK3 - XXXX

Series Type

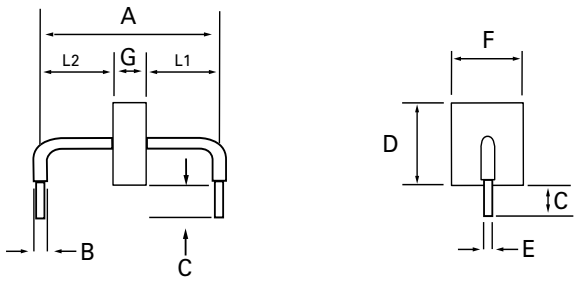
Stand Off Voltage

(Please Refer to Electrical Characteristics Chart)

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
A		0.951 +/- 0.040	24.15 +/- 1.00
B		0.094 +/- 0.024	2.40 +/- 0.60
C		0.236 +/- 0.039	6.00 +/- 1.00
	-208C	0.145 +/- 0.040	3.68 +/- 1.00
D		0.433 max.	11.0 max.
E		0.050 +/- 0.002	1.27 +/- 0.05
F		0.374 max.	9.50 max.
G	-015C	0.093 +/- 0.039	2.36 +/- 1.00
	-030C/-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	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
	-430C	0.583 +/- 0.047	14.80 +/- 1.20
L1	-208C	0.296 +/- 0.047	7.52 +/- 1.20
		L1= L2 tolerance +/- 0.047 inch (+/- 1.20 mm)	
L2	-208C	= A - (G+L1) tolerance +/- 0.047 inch (+/- 1.20 mm)	
		L1= L2 tolerance +/- 0.047 inch (+/- 1.20 mm)	

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