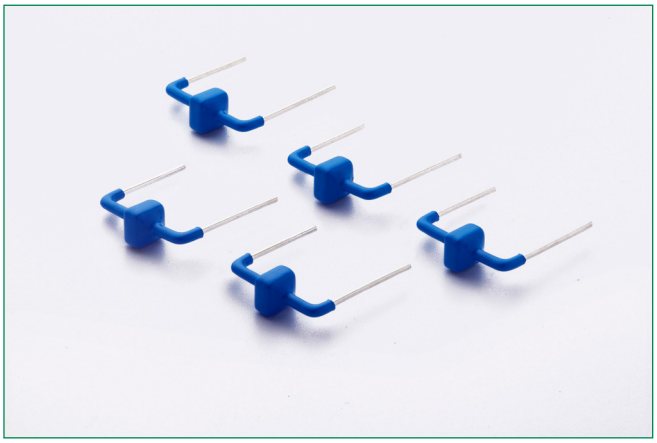
AK3 Series

Axial Leaded – 3kA



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 varistor (MOV) solutions. They can be connected in series and / or parallel to create a very high surge current protection solution.

Features & Benefits

- Very low clamping voltage
- Ultra compact: less than one-tenth the size of traditional discrete solutions
- Sharp breakdown voltage
- Low slope resistance
- Bi-directional
- FoldbakTM 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

Functional Diagram

Bi-directional

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.

Physical Specifications

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

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
					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	12.0
AK3 - 030C	3 - 030C	30	10	15	32	37	10	90	3,000	0.1	11.0
AK3 - 038C	3 - 038C	38	10	15	40	46	10	95	3,000	0.1	10.0
AK3 - 058C	3 - 058C	58	10	15	64	70	10	110	3,000	0.1	6.0
AK3 - 066C	3 - 066C	66	10	15	72	80	10	120	3,000	0.1	6.0
AK3 - 076C	3 - 076C	76	10	15	85	95	10	140	3,000	0.1	6.0
AK3 - 150C	3 - 150C	150	10	15	158	194	10	230	3,000	0.1	2.6
AK3 - 170C	3 - 170C	170	10	15	179	220	10	260	3,000	0.1	2.4
AK3 - 190C	3 - 190C	190	10	15	200	245	10	290	3,000	0.1	2.4
AK3 - 208C	3 - 208C	208	10	15	223	246	10	306	3,000	0.1	2.4
AK3 - 380C	3 - 380C	380	10	15	401	443	10	520	3,000	0.1	2.0
AK3 - 430C	3 - 430C	430	10	15	440	490	10	625	3,000	0.1	2.0

Note: 1. Using 8/20μS wave shape as defined in IEC 61000-4-5.

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

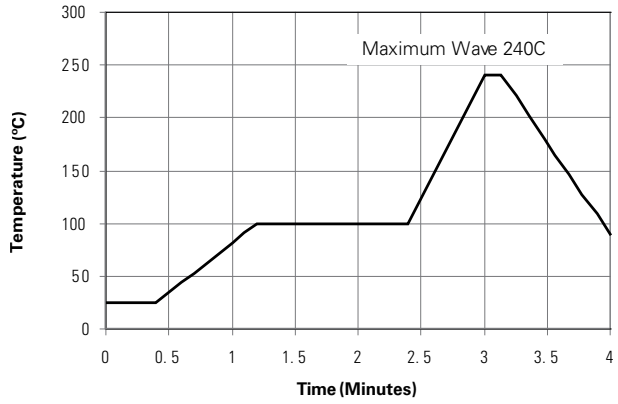
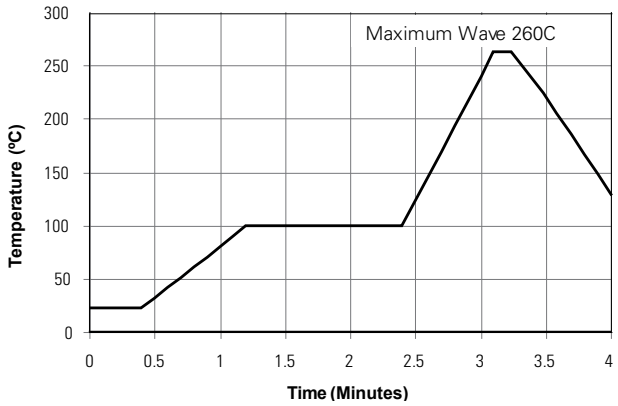


Figure 2:
Lead-free Profile



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

Figure 3:
Peak Power Derating

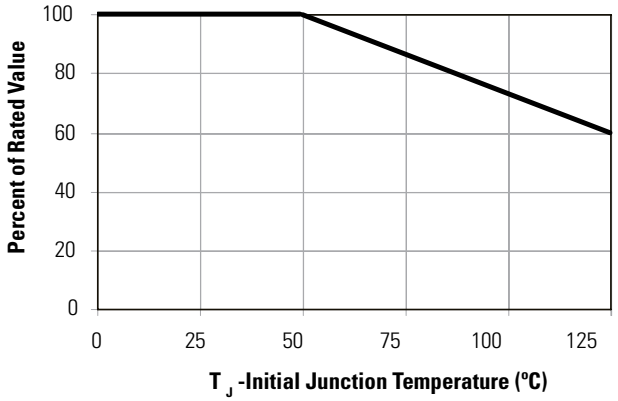
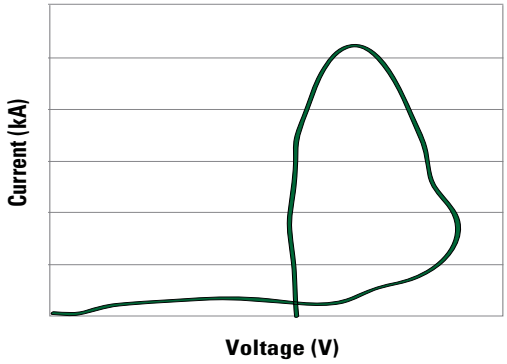


Figure 4:
Surge Response



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

Figure 5:
Typical Peak Pulse Power Rating Curve

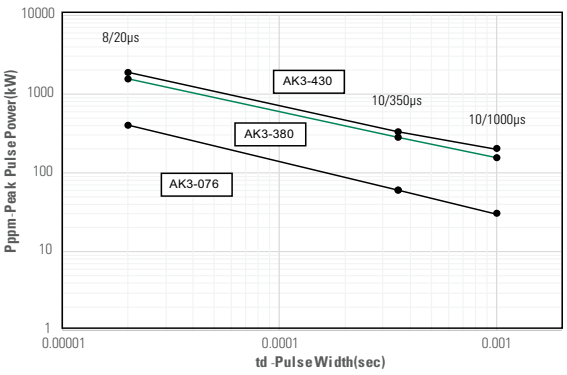


Figure 6:
Typical V_{BR} Vs Junction Temperature

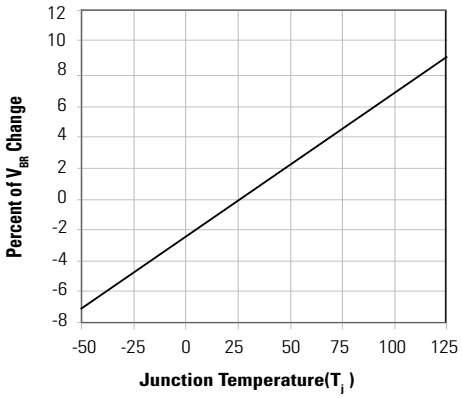


Figure 7:
Surge Response (8/20 Surge current waveform)

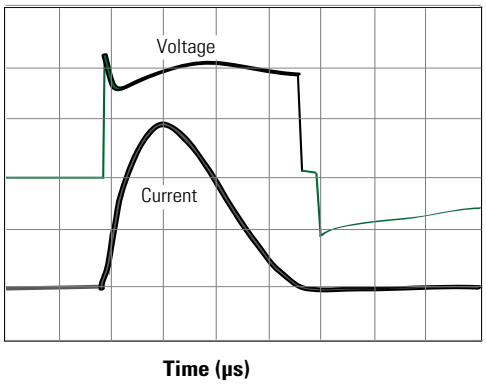
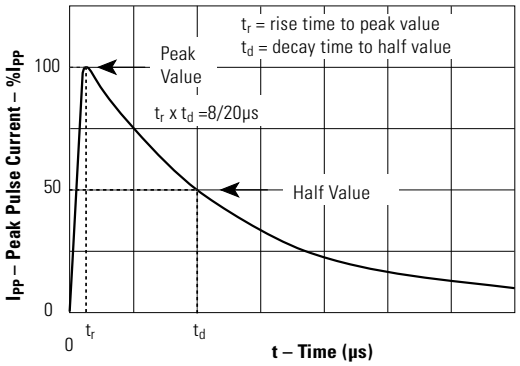


Figure 8:
Pulse Waveform



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.

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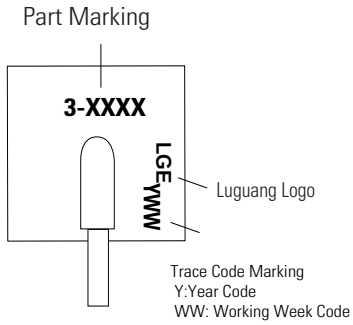
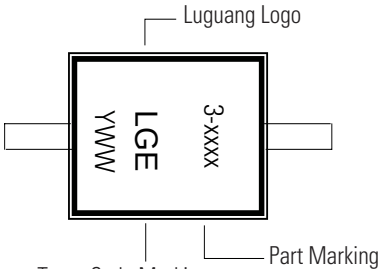
Part Marking System



Apply to P/N listed below:
AK3-015C
AK3-030C
AK3-038C
AK3-058C
AK3-066C
AK3-076C

Type 1- Side View



Apply to P/N listed below:
AK3-150C
AK3-170C
AK3-190C
AK3-208C
AK3-380C
AK3-430C

Type 2 - Top View

Part Numbering System

AK3 - XXXX

Series Type

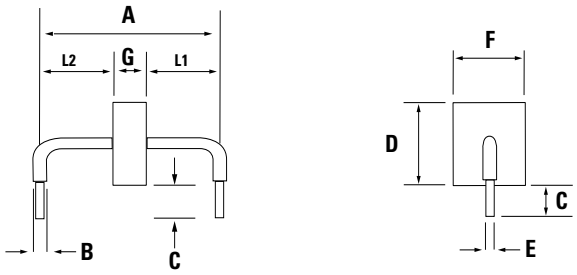
Stand Off Voltage

(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/-038C/-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/-190C	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 (+/- .20 mm)	
		L1= L2 tolerance +/- 0.047 inch (+/- 1.20 mm)	