# **AK3** Series





#### **Agency Approvals**

AGENCY	AGENCY FILE NUMBER
<i>.</i> <b>9</b> <i>1</i>	E128662

#### **Maximum Ratings and Thermal Characteristics** (T<sub>4</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating Storage Temperature Range	T <sub>stg</sub>	(-)55 to 150	°C
Operating Junction Temperature Range	TJ	(-)55 to 125	°C
Current Rating <sup>1</sup>	I <sub>PP</sub>	3	kA

Note:

1. Rated I<sub>pp</sub> measured with 8 x 20µs pulse.

## Description

The AK3 series of high current transient suppressors have been specially designed for use in A.C. line protection and any demanding applications (AC or DC). They offer superior clamping characteristics over standard S.A.D. technologies 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 contained to a minimum, providing the best possible protection level. They can also be connected in series and/ or parallel to create very high capacity protection solutions.

#### **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
- Halogen-free
- RoHS compliant
- Glass passivated junction

Electrical Characteristics										
Part Standoff Numbers (V ) Voltage		Max. Reverse Leakage	Reverse Breakdown Voltage (V <sub>BR</sub> ) @ I <sub>T</sub>		$\begin{array}{lll} \mbox{Test} & \mbox{Max. Clamping Voltage} \\ \mbox{Current} & \mbox{V}_{\rm CL} @ \ \mbox{I}_{\rm p} & \mbox{Peak Pulse} \\ \mbox{I}_{\rm T} & \mbox{Current} & \mbox{(I}_{\rm PP}) & \mbox{(Note 1)} \end{array}$		Max. Temp Coefficient OF V <sub>BR</sub>	emp Max. Agency ient Capacitance Approval BR 0 Bias 10kHz		
	(v <sub>so</sub> ) voits	µA ( <sup>™</sup> R) @ V <sub>SO</sub>	Min Volts	Max Volts	(mA)	V <sub>cL</sub> Volts	I <sub>PP</sub> Amps	(%/ºC)	(nF)	® <b>/ \</b>
AK3 - 015C	15	20	16	19	10	28	3,000	0.1	9	Х
AK3 - 030C	30	20	32	37	10	90	3,000	0.1	11	Х
AK3 - 058C	58	20	64	70	10	110	3,000	0.1	6	Х
AK3 - 066C	66	20	72	80	10	120	3,000	0.1	6	Х
AK3 - 076C	76	20	85	95	10	140	3,000	0.1	6	Х
AK3 - 380C	380	20	401	443	10	520	3,000	0.1	2	Х
AK3 - 430C	430	20	440	490	10	625	3,000	0.1	2	Х
AK3 - 019C AK3 - 030C AK3 - 058C AK3 - 066C AK3 - 076C AK3 - 380C AK3 - 430C	30 58 66 76 380 430	20 20 20 20 20 20 20 20	10   32   64   72   85   401   440	37 70 80 95 443 490	10 10 10 10 10 10 10	90 110 120 140 520 625	3,000 3,000 3,000 3,000 3,000 3,000 3,000	0.1 0.1 0.1 0.1 0.1 0.1 0.1	3 11 6 6 2 2 2	

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



#### **Soldering Parameters**

Reflow Co	ndition	Lead–free assembly
	-Temperature Min (T <sub>s(min)</sub> )	150°C
Pre Heat	-Temperature Max (T <sub>s(max)</sub> )	200°C
	-Time (min to max) (t <sub>s</sub> )	60 – 180 secs
Average ra (T <sub>L</sub> ) to pea	amp up rate (LiquidusTemp k	3°C/second max
$T_{S(max)}$ to $T_L$	- Ramp-up Rate	3°C/second max
Reflow	- Temperature (T <sub>L</sub> ) (Liquidus)	217°C
	-Time (min to max) (t <sub>s</sub> )	60 – 150 seconds
PeakTemp	erature (T <sub>P</sub> )	260 <sup>+0/-5</sup> °C
Time with Temperatu	in 5°C of actual peak ıre (t <sub>p</sub> )	20 – 40 seconds
Ramp-dow	vn Rate	6°C/second max
Time 25°C	to peakTemperature (T <sub>P</sub> )	8 minutes Max.
Do not exc	ceed	280°C



#### Flow/Wave Soldering (Solder Dipping)

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

#### **Physical Specifications**

Weight	Contact manufacturer	
Case	Epoxy encapsulated	
Terminal	Silver plated leads, solderable per MIL-STD-202 Method 208	

### Ratings and Characteristic Curves (T<sub>A</sub>=25°C unless otherwise noted)



## Peak Power Derating



#### Dimensions





		Inches	Millimeters		
Α		0.951 +/- 0.040	24.15 +/- 1.00		
В		0.094 +/- 0.024	2.40 +/- 0.60		
c -015C/-030C -058C/-066C -076C		0.236 +/- 0.039	6.00 +/- 1.00		
	-380C/-430C	0.145 +/- 0.040	3.68 +/- 1.00		
D		0.433 max.	11.0 max.		
Е		0.050 +/- 0.002	1.27 +/- 0.05		
F		0.374 max.	9.50 max.		
	-058C/-066C -076C	0.168 +/- 0.047	4.27 +/- 1.20		
G	-015C/-030C	0.130 +/- 0.047	3.30 +/- 1.20		
	-380C	0.547 +/- 0.047	13.90 +/- 1.20		
	-430C	0.583 +/- 0.047	14.80 +/- 1.20		
L1	-058C/-066C -076C	0.391 +/- 0.047	9.94 +/- 1.20		
	-015C/-030C	0.409 +/- 0.047	10.4 +/- 1.20		
	-380C	0.202 +/- 0.047	5.13 +/- 1.20		
	-430C	0.184 +/- 0.047	4.68 +/- 1.20		
L2		= A - (G+L1) tolerance +/- 0.047 inch (+/- 1.20 mm)			

#### **Part Marking System**



AK3-015C/-030C/-058C/-066C/-076C





