

Agency Recognitions

Agency	Agency File Number
<i>711</i>	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}	1	kA

Note:

1. Rated I_{pp} measured with 8/20 μ s pulse.

Descriptions

The AK1-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). These AK components can be connected in series and / or parallel to create a very high surge current protection solution.

Features & Benefits

- Recognized to UL 497B as an Isolated Loop Circuit
- Both reflow and wave soldering capable
- Very low clamping voltage
- Ultra compact: less than onetenth the size of traditional discrete solutions
- Sharp breakdown voltage
- Low slope resistance
- Bi-directional
- IEC 61000-4-2 ESD 15kV(Air), 8kV (Contact)
- Symmetric in leads width for easier soldering during assembly.

- ESD protection of data lines in accordance with IEC 61000-4-2
- EFT protection of data lines in accordance with IEC 61000-4-4
- UL Recognized compound meeting flammability rating
- 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

Functional Diagram



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}	Typical I _R @ 85°C (μΑ)		Breakdown (V _{BR}) @ I _T	Test Current I _T	Vol	lamping tage Peak Pulse _{PP}) (Note 1)	Max. Temp Coefficient OF V _{BR}	Max. Capacitance 0 Bias 10kHz	Agency Approval
			μΑ		Min Volts	Max Volts	(mA)	V _{CL} Volts	I _{PP} Amps	(%/°C)	(nF)	
AK1-076C-Y	1-076C	76	10	15	85	95	10	140	1,000	0.1	8.5	Χ
AK1-380C-Y	1-380C	380	10	15	401	443	10	570	1,000	0.1	2.0	Χ
AK1-430C-Y	1-430C	430	10	15	440	490	10	625	1.000	0.1	2.0	X

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



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

Figure 1: Peak Power Derating

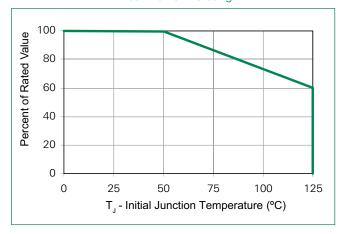


Figure 2:
Typical Peak Pulse Power Rating Curve

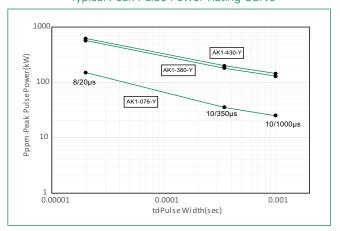


Figure 3:Typical VBR Vs Junction Temperature

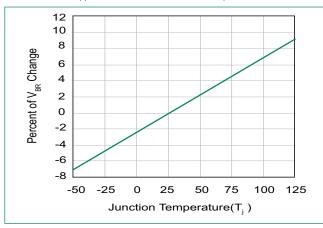
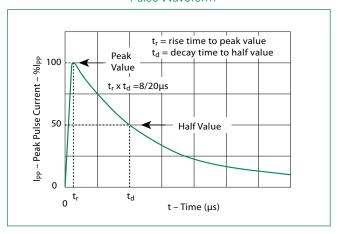


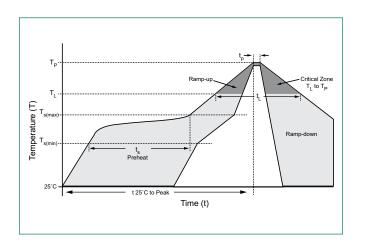
Figure 4: Pulse Waveform



AK1-Y Series Axial Leaded – 1kA

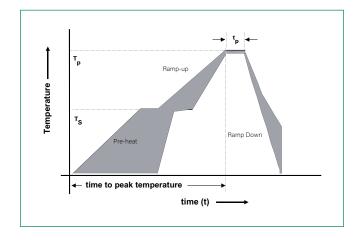
Soldering Parameters

Reflow Con	dition	Lead-free assembly	
	-Temperature Min (T _{s(min)})	150°C	
Pre Heat	-Temperature Max (T _{s(max)})	200°C	
	-Time (min to max) (t _s)	60 – 120 secs	
Average ran	np up rate (Liquidus Temp (T _A)	3°C/second max	
T _{S(max)} to T _A	Ramp-up Rate	3°C/second max	
Reflow	-Temperature (T _L) (Liquidus)	217°C	
nellow	-Time (min to max) (t _L)	60 – 150 seconds	
Peak Temperature (T _P)		260 ^{+0/-5} °C	
Time withir	n 5°C of actual peak Temperature	30 seconds	
Ramp-down	n Rate	6°C/second max	
Time 25°C t	o peak Temperature (T _P)	8 minutes Max.	
Do not exce	ed	260°C	



Flow Soldering (Solder Dipping)

Reflow Con	dition	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 ran	np up rate to Pre-Heat Temp	5°C/second max	
Peak Tempe	rature (T _P)	260 ^{+0/-5} °C	
Average ran	np up rate (pre-heat to T _P)	5°C/second max	
Time within	n actual peak Temperature Max	6 seconds	
Ramp-dow	n Rate	5°C/second max	



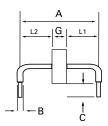
Physical Specifications

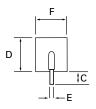
Weight	Contact manufacturer
Case	UL Recognized compound meeting flammability rating V-0
Terminal	Silver plated leads, solderable per MIL-STD-750 Method 2026



AK1-Y Series Axial Leaded – 1kA

Dimensions



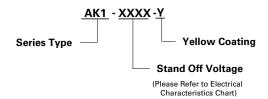


Dimensions	Inches	Millimeters	
Α	0.950 +/- 0.040	24.15 +/- 1.00	
В	0.095 +/- 0.024	2.4 +/- 0.60	
С	0.236 +/- 0.039	6.00 +/- 1.00	
D	0.570 max.	14.48 max.	
E	0.050 +/- 0.002	1.270 +/- 0.05	
F	0.500 max.	12.70 max.	
G-076C-Y	0.096 +/- 0.040	2.44 +/- 1.00	
G-380C-Y/ 430C-Y	0.220 +/- 0.040	5.60 +/-1 mm	
L1/L2	L1= L2 tolerance +/-	0.04 inch (1.0 mm)	

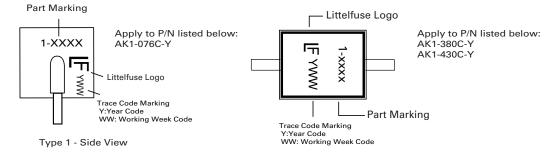
Packing Options

Part Number	Component Package	Quantity	Packaging Option
AK1-XXXX-Y	AK Package	56pcs/Box	Bulk
AK1-XXXX-Y-12	AK Package	12pcs/Box	Bulk

Part Numbering System



Part Marking System



Type 2- Top View

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