AK1-Y Series

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.

Agency Recognitions

AGENCY	AGENCY FILE NUMBER
	E128662

Features

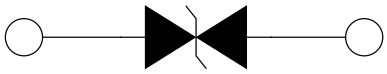
- Recognized to UL 497B as an Isolated Loop Circuit Protector
- Both reflow and wave soldering capable
- Very low clamping voltage
- Ultra compact: less than one-tenth the size of traditional discrete solutions
- Sharp breakdown voltage
- Low slope resistance
- Bi-directional
- IEC-61000-4-2 ESD 15kV(Air), 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 V-0
- 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

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 8/20μs pulse.

Functional Diagram



Bi-direcctional

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)	
AK1-076C-Y	1-076C	76	10	15	85	95	10	140	1,000	0.1	8.5	X
AK1-380C-Y	1-380C	380	10	15	401	443	10	570	1,000	0.1	2.0	X
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.

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

Figure 1 - Peak Power Derating

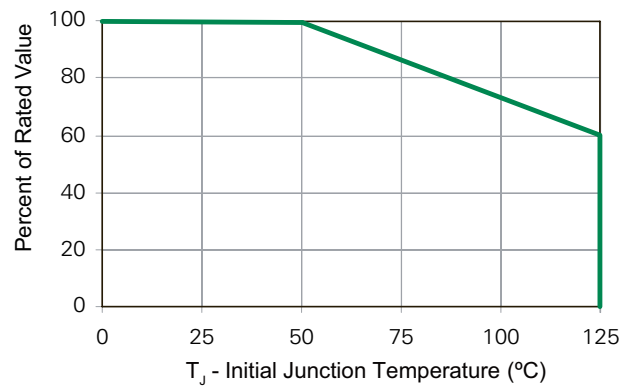


Figure 2 - Typical Peak Pulse Power Rating Curve

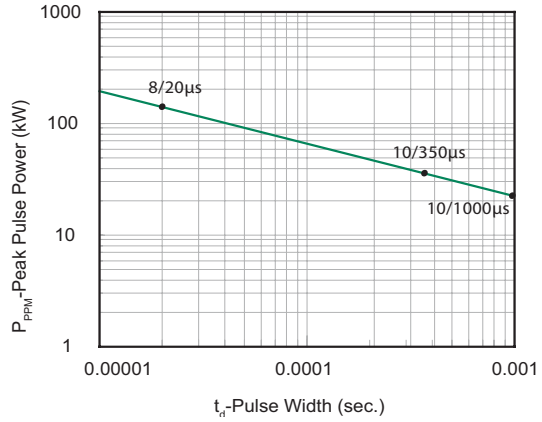


Figure 3 - Typical V_{BR} Vs Junction Temperature

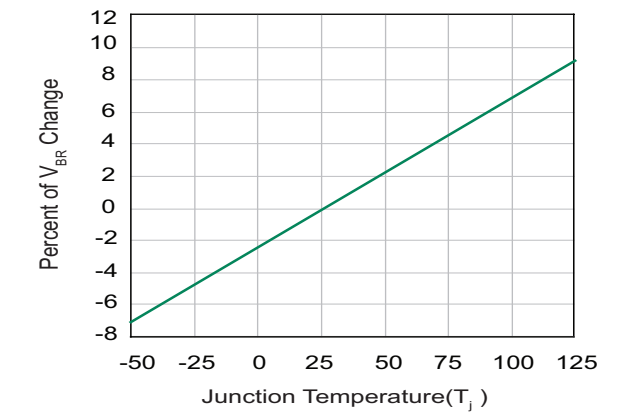
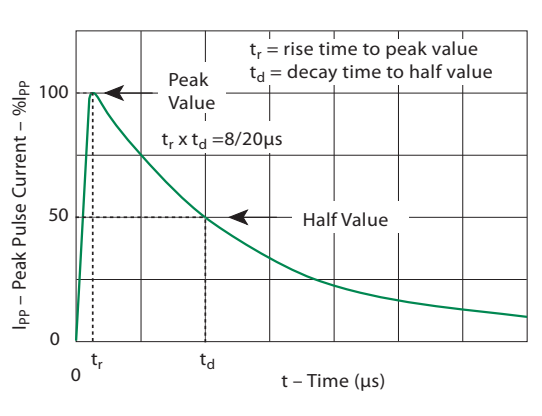
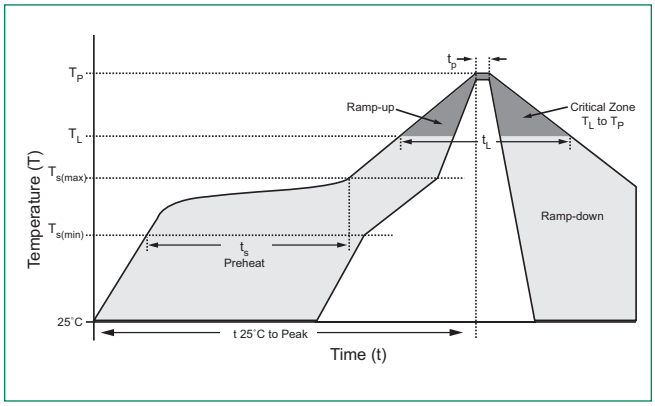


Figure 4 - Pulse Waveform



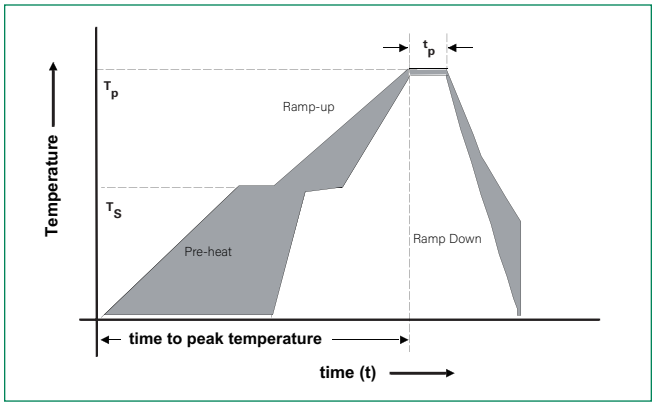
Soldering Parameters

Reflow Condition		Lead–free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 120 secs
Average ramp up rate (Liquidus Temp (T_A) to peak		3°C/second max
$T_{S(max)}$ to T_A - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		30 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260°C



Flow Soldering (Solder Dipping)

Reflow Condition		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 ramp up rate to Pre-Heat Temp		5°C/second max
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Average ramp up rate (pre-heat to T_P)		5°C/second max
Time within actual peak Temperature Max		6 seconds
Ramp-down 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

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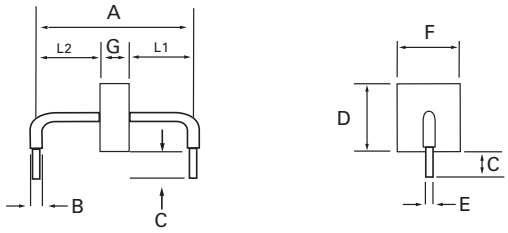
TVS Diodes
Axial Leaded – 1kA > AK1-Y series

Dimensions

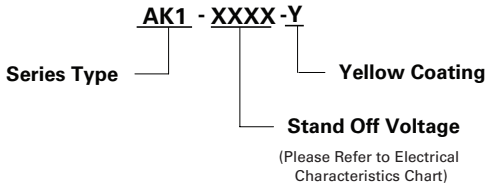


Dimensions	Inches	Millimeters
A	0.950 +/- 0.040	24.15 +/- 1.00
B	0.095 +/- 0.024	2.4 +/- 0.60
C	0.236 +/- 0.039	6.00 +/- 1.00
D	0.570 max.	14.48 max.
E	0.050 +/- 0.002	1.270 +/- 0.05
F	0.500 max.	12.70 max.
G-076C-Y	0.096 +/- 0.040	2.44 +/- 1.00
G-380C-Y/ 430C-Y	0.220 +/- 0.040	5.60 +/-1 mm
L1/L2	L1=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

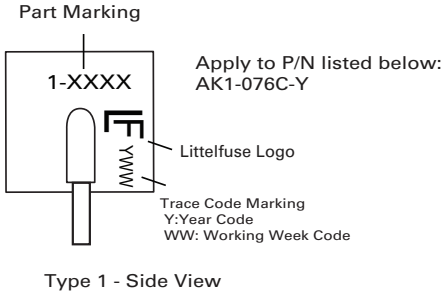
Packing Options

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

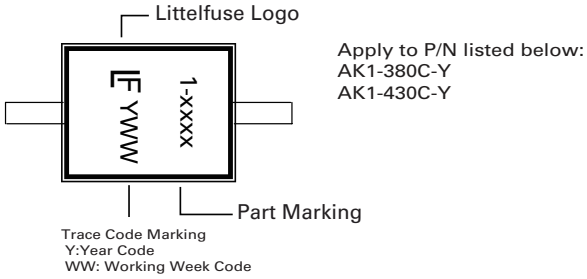
Part Numbering System



Part Marking System



Type 1 - Side View



Type 2- Top View

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Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Littelfuse:

AK1-430C-Y AK1-076C-Y AK1-380C-Y AK1-430C AK1-380C