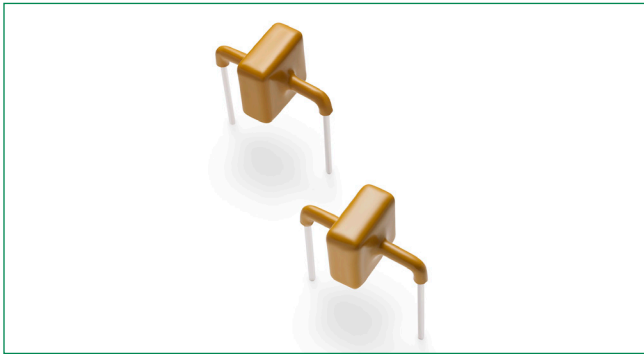


AK15-Y Series



Agency Approvals

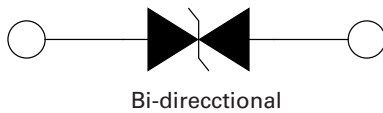
Agency	Agency File Number
	E128662

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}	15	kA

Note:
1. Rated I_{PP} measured with 8/20 pulse as defined in IEC 61000-4-5 2nd edition.

Functional Diagram



Descriptions

The AK15-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). It accomplishes this by virtue of the Littelfuse Foldback™ 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 maintained at a minimum magnitude, providing the best possible protection level. These AK components can be connected in series and / or parallel to create a very high surge current protection solution.

Features

- No wear-out nor degrade surge rating over multiple transient events as long as within surge capability
- Ultra high power rating
- Very low clamping voltage
- Both reflow and wave soldering capable
- Ultra compact: less than one-tenth the size of traditional discrete solutions
- Sharp breakdown voltage
- Low slope resistance
- Bi-directional
- Foldback technology for superior clamping factor
- Symmetric lead width for easy soldering during assembly
- IEC 61000-4-2 ESD 15 kV (air), 8 kV (contact) rating
- Lightning, 15 kA (8/20 as defined in IEC 61000-4-5 2nd Edition)
- EFT protection of data lines in accordance with IEC 61000-4-4
- 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 (IPC/ JEDEC J-STD-609A.01)

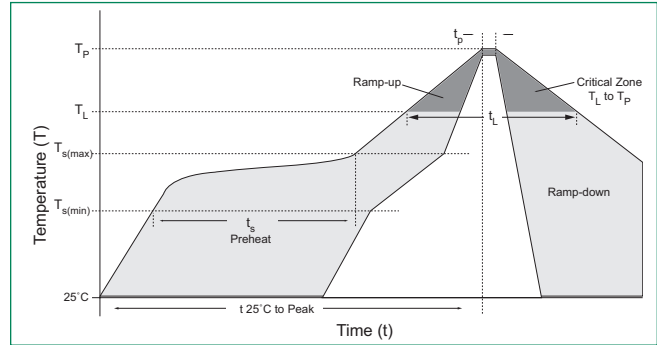
Electrical Characteristics (T_A=25°C unless otherwise noted)

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 (mA)	Max. Clamping Voltage V _{CL} @ Peak Pulse Current (I _{PP})			Max. Temp Coefficient of V _{BR} (%/°C)	Max. Capacitance 0V Bias 10kHz (nF)	Agency Approval
					Min Volts	Max Volts		V _{CL} Volts	I _{PP} (8/20µs) (A)	I _{PP} (10/350µs) (A)			
AK15-058C-Y	15-058C	58	10	15	64	70	10	110	15,000	2,000	0.1	16	X
AK15-066C-Y	15-066C	66	10	15	72	80	10	120	15,000	2,000	0.1	12	X
AK15-076C-Y	15-076C	76	10	15	85	95	10	150	15,000	2,000	0.1	12	X
AK15-190C-Y	15-190C	190	10	15	200	245	10	290	15,000	1,500	0.1	5	X

Note: Using the 8/20 waveshape as defined in IEC 61000-4-5 2nd Edition.

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_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 – 150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		30 seconds max
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes max.
Do not exceed		260°C

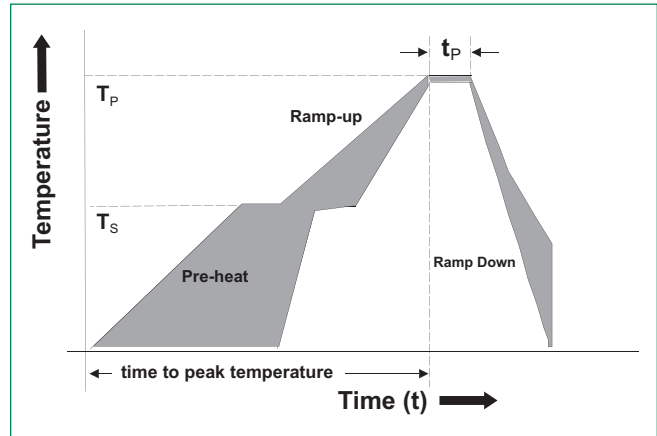


Physical Specifications

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

Flow Soldering (Solder Dipping)

Wave soldering condition		Pb - Free assembly
Pre Heat	- Temperature Min	140°C
	- Temperature Max	160°C
	- Time to Pre-Heat Temp	60-150 seconds
Average ramp up rate to Pre-Heat Temp		5°C/second max
Peak Temperature		260+0/-5 °C
Average ramp up rate (Tpre-heat to Tp)		5°C/second max
Time within actual peak Temperature Max		6 seconds
Ramp-down Rate		5°C/second max



Ratings and Characteristic Curves ($T_a=25^\circ\text{C}$ unless otherwise noted)

Figure 1- Peak Power Derating

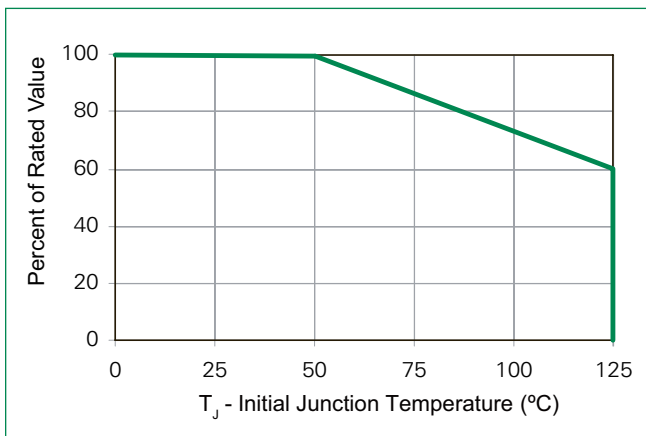
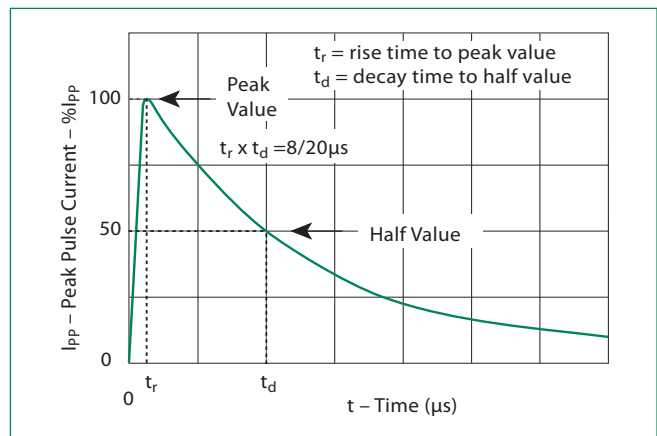


Figure 2 - Pulse Waveform



Ratings and Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted) (Continued)

Figure 3 - Typical Peak Pulse Power Rating Curve

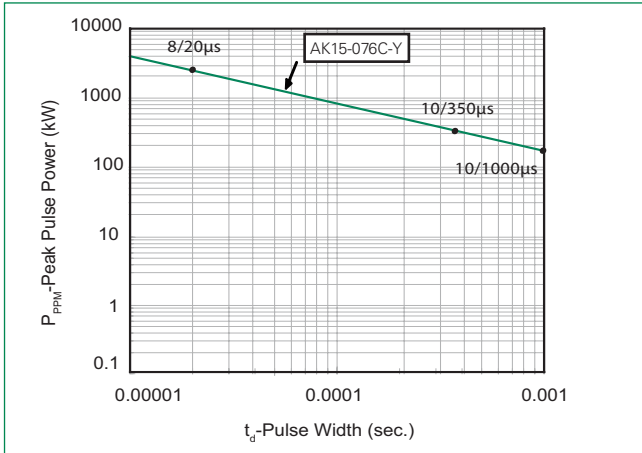


Figure 4 - Typical V_{BR} Vs Junction Temperature

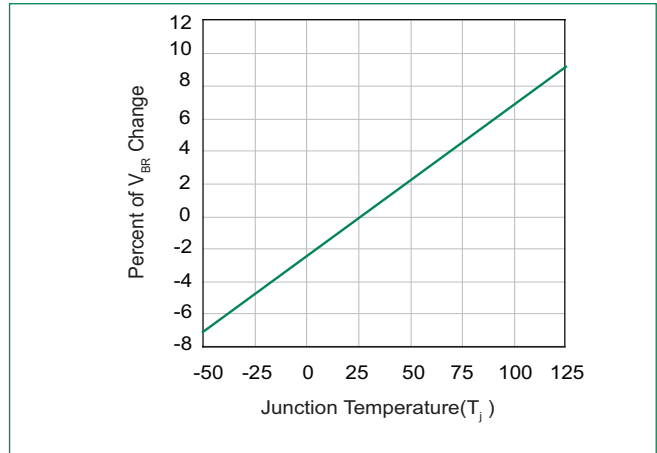
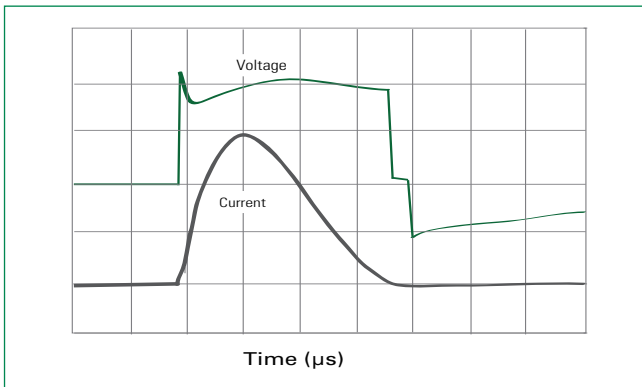
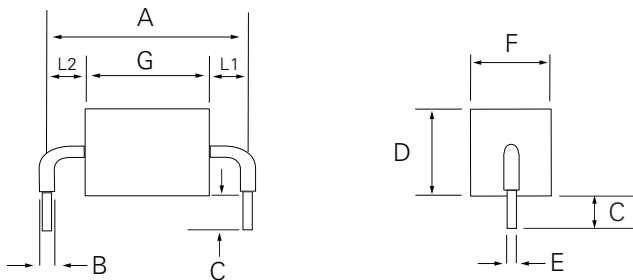


Figure 5 - Surge Response (8/20 Surge current waveform)



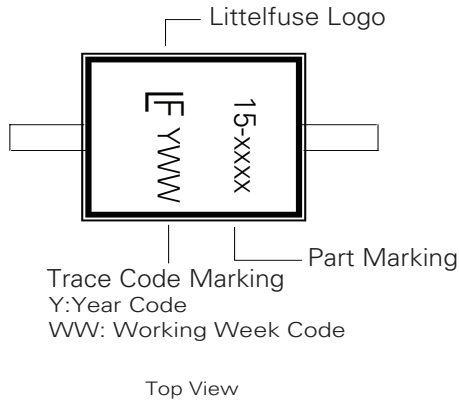
Note: The power dissipation causes a change in avalanche voltage during the surge and the avalanche voltage eventually returns to the original value when the transient has passed.

Dimensions

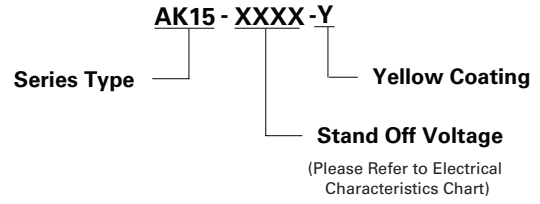


Dimensions	Inches	Millimeters
A	0.95±0.03	24.15±0.8
B	0.095±0.024	2.4±0.60
C	0.236±0.04	6.00±1.0
D	0.630±0.055	16.0±1.4
E	0.050±0.002	1.27±0.05
F	0.571±0.055	14.5±1.4
G - 058C-Y	0.292±0.047	7.41±1.20
G - 066C/076C-Y	0.351±0.047	8.91±1.20
G - 190C-Y	0.362±0.04	9.2±1.00
L1/L2	L1= L2 tolerance +/- 0.04 inch (1.0 mm)	

Part Marking System



Part Numbering System



Packing Options

Part Number	Component Package	Quantity	Packaging Option
AK15-XXXX-Y	AK Package	56pcs/Box	Bulk
AK15-XXXX-Y12	AK Package	12pcs/Box	Bulk

Disclaimer Notice - Littelfuse products are not designed for, and shall not be used for, any purpose (including, without limitation, automotive, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage) other than those expressly set forth in applicable Littelfuse product documentation. Warranties granted by Littelfuse shall be deemed void for products used for any purpose not expressly set forth in applicable Littelfuse documentation. Littelfuse shall not be liable for any claims or damages arising out of products used in applications not expressly intended by Littelfuse as set forth in applicable Littelfuse documentation. The sale and use of Littelfuse products is subject to Littelfuse Terms and Conditions of Sale, unless otherwise agreed by Littelfuse. "Littelfuse" includes Littelfuse, Inc., and all of its affiliate entities. <http://www.littelfuse.com/disclaimer-electronics>