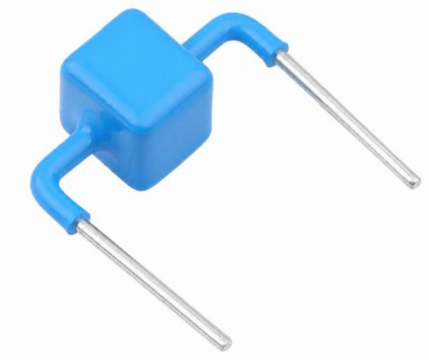
AK6 Series TVS Diodes Datasheet



Description

The AK6 series of high power TVS Diode is 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 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
- Bi-directional
- IEC-61000-4-2 ESD 15kV(Air), 8kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2 (IEC801-2)
- EFT protection of data lines in accordance with IEC 61000-4-4 (IEC801-4)

Maximum Ratings and Thermal Characteristics Features (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating Junction and StorageTemperature Range	T_J , T_{STG}	**-55 to 125**	**°C**
Current Rating[1]	I_{PP}	**6**	**kA**

Note: 1. Rated I_{PP} measured with 8/20μS pulse

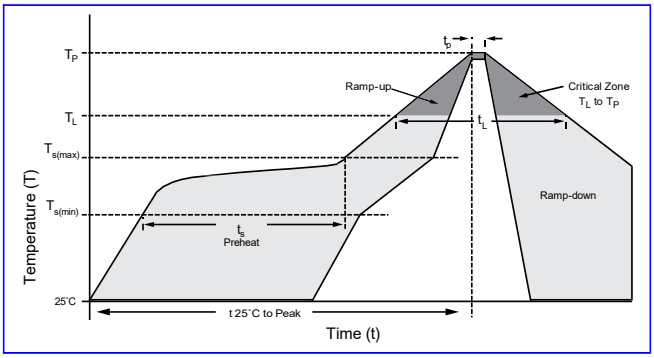
Electrical Characteristics (T_A=25°C unless otherwise noted)

Part Numbers	Stand-Off Voltage(Vso) Volts	Breakdown Voltage V_{BR}@I_T		Test Current	Max.Clamping Voltage V_{CL} @ I_{PP} Peak Pluse Current(I_{PP}) (Note 1)		Max.Reverse Leakage(I_R) @V_{SO}	Max.Temp Coefficient OF V_{BR}	Max.Capacitance o Bias 10kHz
	V	Min(V)	Max(V)	I_T(mA)	V_{CL}(Volts)	I_{PP} Amps	(μA)	(% /°C)	(nF)
AK6-012C	12.8V	13V	17V	10	28V	6000A	10	0.1	11.5
AK6-015C	15V	16V	19V	10	30V	6000A	10	0.1	9.0
AK6-020C	20V	22V	24V	10	50V	6000A	10	0.1	10.3
AK6-030C	30V	32V	37V	10	90V	6000A	10	0.1	11.0
AK6-042C	42V	47V	51V	10	105V	6000A	10	0.1	8.0
AK6-058C	58V	64V	70V	10	110V	6000A	10	0.1	8.0
AK6-066C	66V	72V	80V	10	120V	6000A	10	0.1	6.0
AK6-076C	76V	85V	95V	10	140V	6000A	10	0.1	6.5
AK6-170C	170V	180V	220V	10	260V	6000A	10	0.1	2.8
AK6-190C	190V	200V	235V	10	290V	6000A	10	0.1	2.5
AK6-200C	200V	222V	245V	10	330V	6000A	10	0.1	2.3
AK6-240C	240V	250V	285V	10	340V	6000A	10	0.1	2.0
AK6-270C	270V	280V	320V	10	380V	6000A	10	0.1	1.6
AK6-350C	350V	382V	422V	10	506V	6000A	10	0.1	1.5
AK6-380C	380V	401V	443V	10	520V	6000A	10	0.1	1.4
AK6-430C	430V	440V	490V	10	625V	6000A	10	0.1	1.0

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

Soldering Parameters

ReflowCondition		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 – 180 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
PeakTemperature(T_P)		$260^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peakTemperature (T_P)		8 minutes Max.
Do not exceed		280°C



Flow/Wave Soldering (Solder Dipping)

PeakTemperature :	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-750, Method 2026

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

Figure 1 - Peak Power Derating

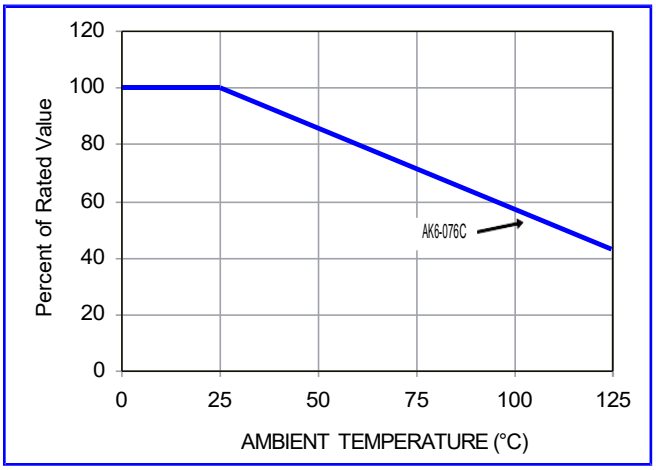


Figure 2 - Surge Response

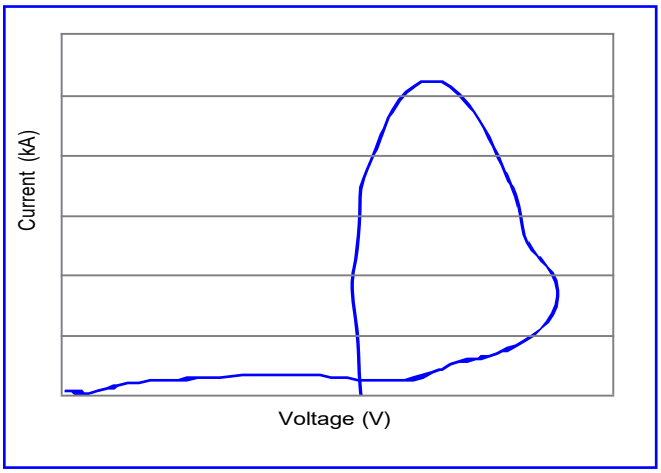
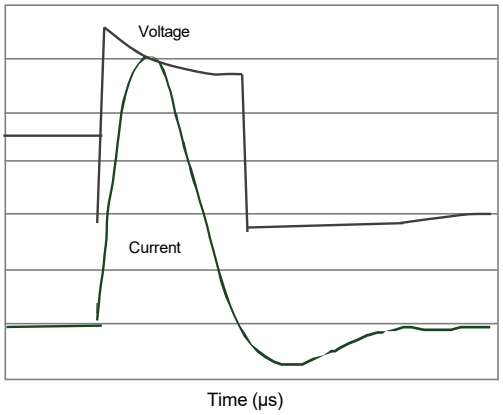


Figure 3 - Surge Response (8/20 Surge current waveform)

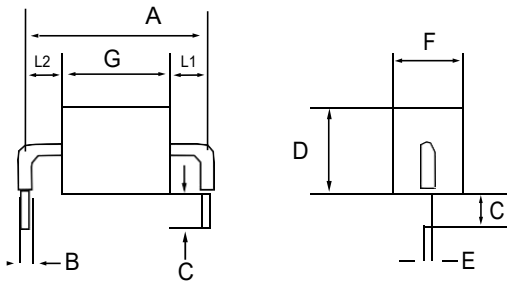


Notes:

1. Foldback characteristic reduce the clamping voltage to near the breakdown voltage

2. 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

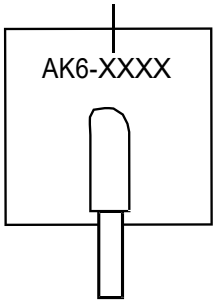
Dimensions



Dimensions	Inches	Millimeters
A	0.950 +/- 0.040	24.15 +/- 1.00
B	0.095 +/- 0.024	2.4 +/- 0.60
C - 030C/058C 066C/076C	0.236 +/- 0.040	6.00 +/- 1.00
C	0.145 +/- 0.040	3.68 +/- 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 - 030C/058C 066C/076C	0.200 +/- 0.040	5.08 +/- 1.00
G - 170C/190C	0.320 +/- 0.040	8.13 +/- 1.00
G - 240C	0.370 +/- 0.040	9.4 +/- 1.00
G - 380C/430C	0.543 +/- 0.040	13.8 +/- 1.00
L1	0.310 +/- 0.040	7.87 +/- 1.00
L1 - 380C/430C	0.150 +/- 0.040	3.81 +/- 1.00
L2= A - (G+L1) tolerance +/- 0.04 inch (1.0 mm)		

Part Marking System

Product Type



Side View

Part Numbering System

AK6 -XXXX

Series Type

Stand Off Voltage

(Please Refer to Electrical Characteristics Chart)

Packing Options

Part Number	Component Package	Quantity	Packaging Option
AK6-XXXX	AK Package	56pcs	Bulk