ALC10S Series, +85°C

Overview

KEMET's ALC10S Series of capacitors features improvements in general construction of the capacitors to achieve better results in audio, where fidelity of the waveshape is very important. Great attention has been paid to the construction details that can affect performance such as foil type, its connections and mechanical construction. Details of capacitance and case sizes are available in KEMET's slit foil capacitor range.

Applications

Modern electrolytic capacitors are designed for use in power supplies, thus, most aspects of their design have been optimized for this application. Some advances in design may not be beneficial in audio applications where the requirements of the capacitors are very different.

KEMET has produced the ALC10S slit foil capacitors specifically for audio applications. Its patented design eliminates circulating currents in the aluminium foils. This spurious current flow on the capacitor plates is known to occur but not apparent in most applications.

Benefits

- 2 pin snap-in
- Long life, up to 18,000 hours at +85°C (V_R, I_R applied)
- Slit foil technology
- Specifically designed for audio applications use only

Part Number System

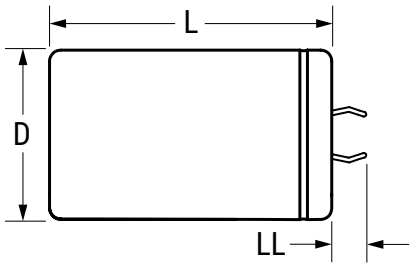
ALC10	S	110 2	DF
Series	Construction	Unique Sequential Number	Size Code
Snap-In type Aluminum Electrolytic	S = Slit foil		See Dimension Table

Performance Characteristics

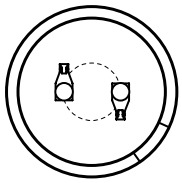
Item	Performance Characteristics		
Capacitance Range	10,000 µF		
Rated Voltage	50 – 100 VDC		
Operating Temperature	–40 to +85°C		
Storage Temperature Range	–55 to +85°C		
Capacitance Tolerance	±20%		
Operational Lifetime	D (mm)	Rated Voltage and Ripple Current at +85°C (hours)	Rated Voltage at +85°C (hours)
	35	15,000	24,000
	40	18,000	29,000
Shelf Life	2,000 hours at +85°C or 30,000 hours at +40°C 0 VDC		
Leakage Current	I = 0.006 CV or 6,000 (µA, whichever is smaller)		
	C = rated capacitance (µF), V = rated voltage (VDC). Voltage applied for 5 minutes at +20°C.		
Standards	IEC 60384–4		

Dimensions – Millimeters

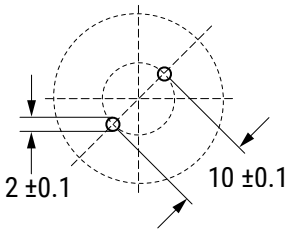
SIDE VIEW



TERMINAL END VIEW



PCB LAYOUT



Size Code	Dimensions in mm			Approximate Weight Grams
	D	L	LL	
	Nominal		±1.0	
DF	35	50	6.3	70
DH	35	60	6.3	80
DL	35	80	6.3	105
EX	40	90	6.3	147
Note: Dimensions include sleeving				

Table 1 – Ratings & Part Number Reference

VDC	Rated Capacitance (µF)	Case Size	Part Number
50	10,000	35 x 50	ALC10S1102DF
63	10,000	35 x 60	ALC10S1103DH
80	10,000	35 x 80	ALC10S1104DL
100	10,000	40 x 90	ALC10S1105EX

Shelf Life

The capacitance, ESR and impedance of a capacitor will not change significantly after extended storage periods, however the leakage current will very slowly increase. KEMET products are particularly stable and allow a shelf life in excess of three years at 40°C. See sectional specification under each product series for specific data.

Re-age (Reforming) Procedure

Apply the rated voltage to the capacitor at room temperature for a period of one hour, or until the leakage current has fallen to a steady value below the specified limit. During re-aging a maximum charging current of twice the specified leakage current or 5 mA (whichever is greater) is suggested.

Environmental Compliance

All Part Numbers in this datasheet are Reach and RoHS compliant.

As an environmentally conscious company, KEMET is working continuously with improvements concerning the environmental effects of both our capacitors and their production.

In Europe (RoHS Directive) and in some other geographical areas such as China, legislation has been put in place to prevent the use of some hazardous materials, such as lead (Pb), in electronic equipment. All products in this catalog are produced to help our customers' obligations to guarantee their products and fulfill these legislative requirements. The only material of concern in our products has been lead (Pb), which has been removed from all designs to fulfill the requirement of containing less than 0.1% of lead in any homogeneous material. KEMET will closely follow any changes in legislation worldwide and make any necessary changes in its products, whenever needed.

Some customer segments such as medical, military and automotive electronics may still require the use of lead in electrode coatings. To clarify the situation and distinguish products from each other, a special symbol is used on the packaging labels for RoHS compatible capacitors.

Due to customer requirements, there may appear additional markings such as lead-free (LF), or lead-free wires (LFW) on the label.

Mechanical Data

Polarity and Reversed Voltage
Aluminium Electrolytic capacitors manufactured for use in DC applications contain an anode foil and a cathode foil. As such, they are polarized devices and must be connected with the +ve to the anode foil and the -ve to the cathode foil. If this were to be reversed then the electrolytic process that took place in forming the oxide layer on the anode would be recreated in trying to form an oxide layer on the cathode. In forming the cathode foil in this way, heat would be generated and gas given off within the capacitor, usually leading to catastrophic failure.

The cathode foil already possesses a thin stabilized oxide layer. This thin oxide layer is equivalent to a forming voltage of approximately 2 V. As a result, the capacitor can withstand a voltage reversal of up to 2 V for short periods. Above this voltage, the formation process will commence. Aluminium Electrolytic capacitors can also be manufactured for use in intermittent AC applications by using two anode foils in place of one anode and one cathode.

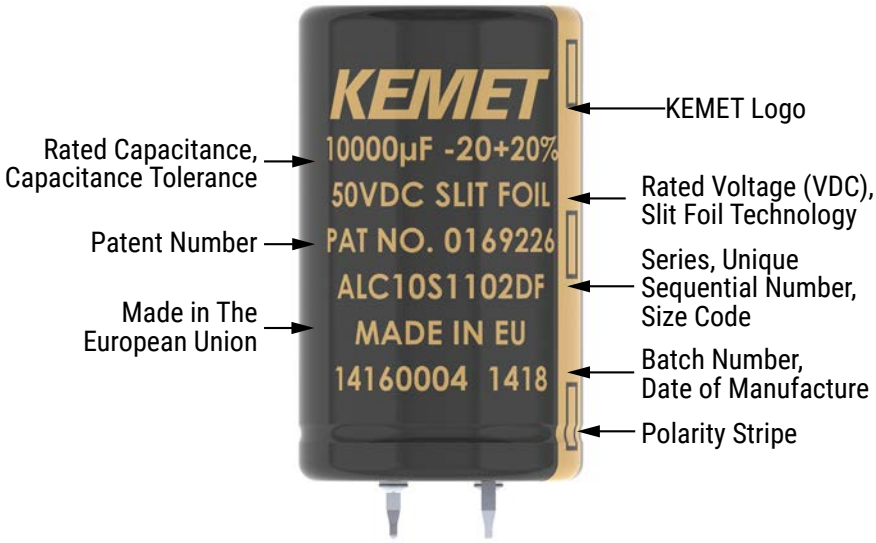
Mounting Position
The capacitor can be mounted upright or inclined to a horizontal position.

Insulating Resistance
≥ 100 MΩ at 100 VDC across insulating sleeve.

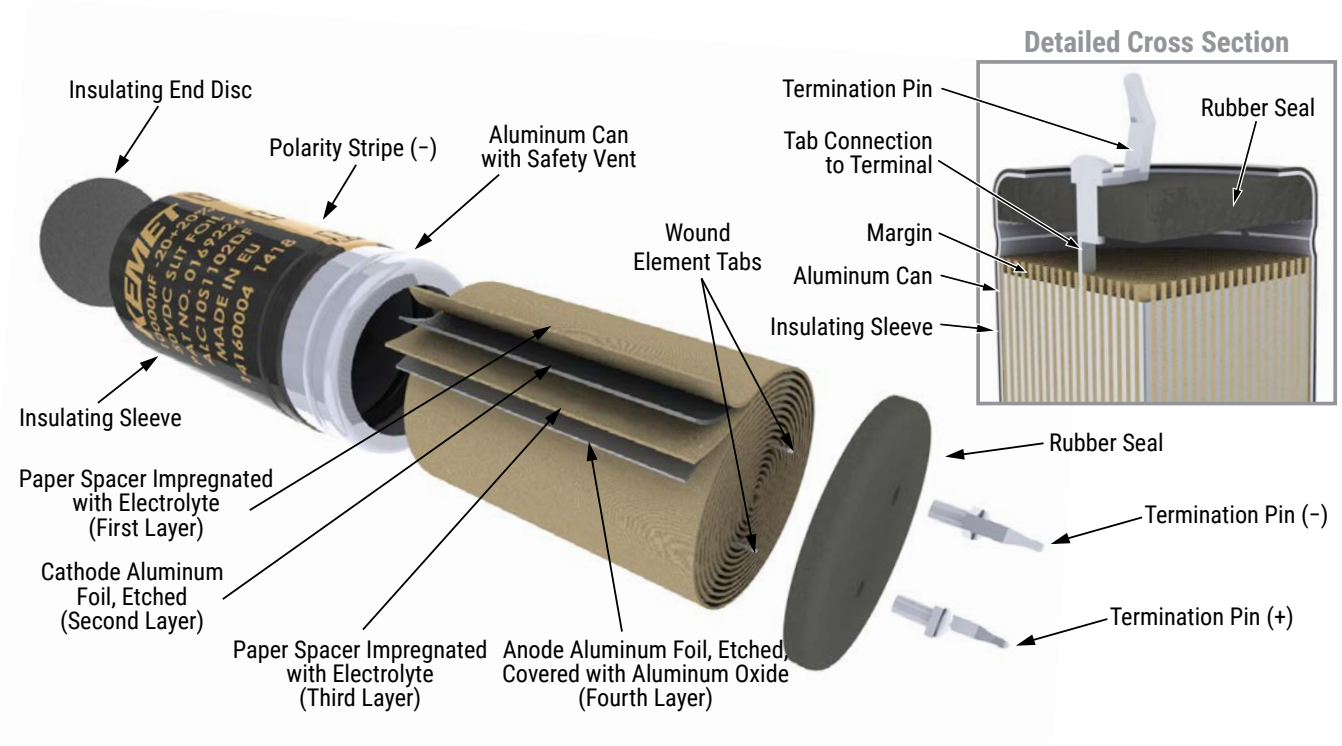
Voltage Proof
≥ 2,500 VDC across insulating sleeve.

Safety Vent
A safety vent for overpressure is featured on either the base (opposing end to the terminals) or the side of the can. This appears in the form of a grooved section on the surface of the can, which is a weakened area and designed to relieve build-up of internal pressure due to overstress or catastrophic failure.

Marking

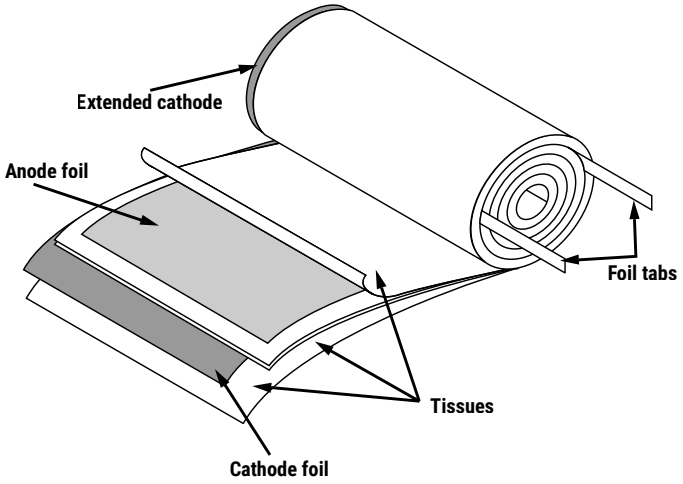


Construction



Construction Data

The manufacturing process begins with the anode foil being electrochemically etched to increase the surface area and then “formed” to produce the aluminum oxide layer. Both the anode and cathode foils are then interleaved with absorbent paper and wound into a cylinder. During the winding process, aluminum tabs are attached to each foil to provide the electrical contact.



The deck, complete with terminals, is attached to the tabs and then folded down to rest on top of the winding. The complete winding is impregnated with electrolyte before being housed in a suitable container, usually an aluminum can, and sealed. Throughout the process, all materials inside the housing must be maintained at the highest purity and be compatible with the electrolyte.

Each capacitor is aged and tested before being sleeved and packed. The purpose of aging is to repair any damage in the oxide layer and thus reduce the leakage current to a very low level. Aging is normally carried out at the rated temperature of the capacitor and is accomplished by applying voltage to the device while carefully controlling the supply current. The process may take several hours to complete.

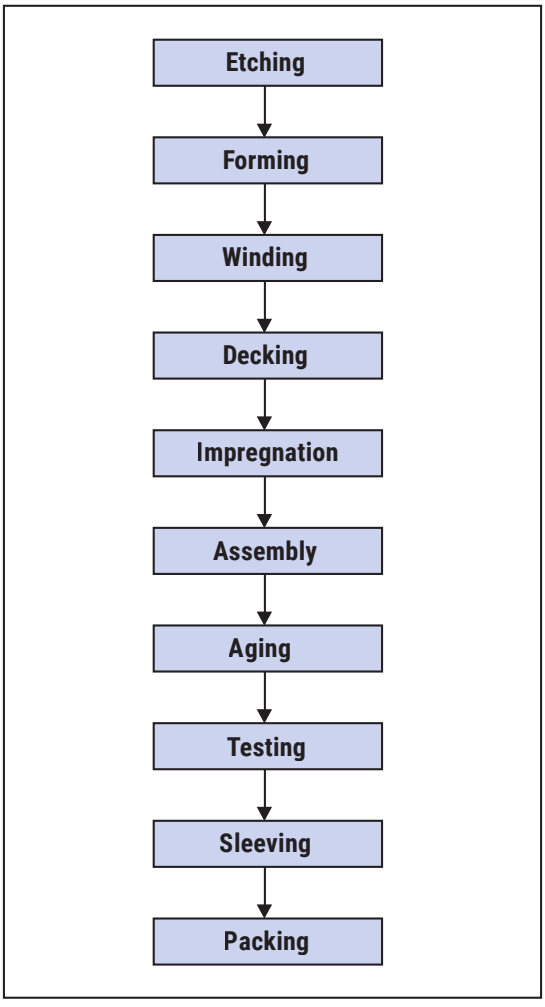
Damage to the oxide layer can occur due to variety of reasons:
- Slitting of the anode foil after forming
- Attaching the tabs to the anode foil
- Minor mechanical damage caused during winding

A sample from each batch is taken by the quality department after completion of the production process.

The following tests are applied and may be varied at the request of the customer. In this case the batch, or special procedure, will determine the course of action.

Electrical:
- Leakage current
- Capacitance
- ESR
- Impedance
- Tan Delta

Mechanical/Visual:
- Overall dimensions
- Torque test of mounting stud
- Print detail
- Box labels
- Packaging, including packed quantity



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Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product–related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicted or that other measures may not be required.

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