



## Overview

KEMET's A957 is an electrolytic capacitor module with outstanding electrical performance and high ripple current. This device contains a bank of ALF70 Aluminum Electrolytic Capacitors mounted on high current designed PCB. These assembled parts are housed by a plastic case and heat sinked by a casted aluminum plate.

## Benefits

- Capacitor bank ready to fit into application
- Eliminates the use of voltage sharing resistors
- Capacitor Bank with heat-sink included
- Long life, up to 18,000 hours at +85°C ( $V_R$ ,  $I_R$  applied)
- Extremely high ripple current
- Low ESL
- Outstanding electrical performance

## Applications

The KEMET A957 is an electrolytic capacitor module, designed mainly for applications, like Solar Inverters, Motor Drives, and Pulsed Power.



## Part Number System

<b>A</b>	<b>957</b>	<b>AL</b>	<b>132</b>	<b>M</b>	<b>800</b>	<b>S</b>
Capacitor Class	Series	Size Code	Capacitance Code ( $\mu\text{F}$ )	Tolerance	Rated Voltage (VDC)	Termination
A = Aluminum	Aluminum Electrolytic Capacitor Module	See Dimension Table	First two digits represent significant figures. Third digit specifies number of zeros.	M = $\pm 20\%$	700 = 700 V 800 = 800 V 900 = 900 V 1K0 = 1,000 V 1K1 = 1,100 V 1K2 = 1,200 V	S = Screw

## Performance Characteristics

Item	Performance Characteristics	
Capacitance Range	560 – 1,800 $\mu$ F	
Rated Voltage	700 – 1,200 VDC	
Operating Temperature	–40 to +85°C	
Storage Temperature Range	–55 to +85°C	
Capacitance Tolerance	$\pm$ 20% at 100 Hz/+20°C	
Operational Lifetime	Rated Voltage and Ripple Current at +85°C (hours)	Rated Voltage at +85°C (hours)
	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 $\mu$ A (whichever is smaller)	
	C = rated capacitance ( $\mu$ F), V = rated voltage (VDC). Voltage applied for 5 minutes at +20°C.	
Vibration Test Specifications	Procedure	Requirements
	0.35 mm displacement amplitude or 5 G maximum acceleration. Vibration applied for three directions 0.5-hour sessions at 10 – 55 Hz.	No leakage of electrolyte or other visible damage. Deviations in capacitance from initial measurements must not exceed $\Delta$ C/C $\pm$ 5%
Standards	IEC 60384–4 long life grade 40/85/56	

## Surge Voltage

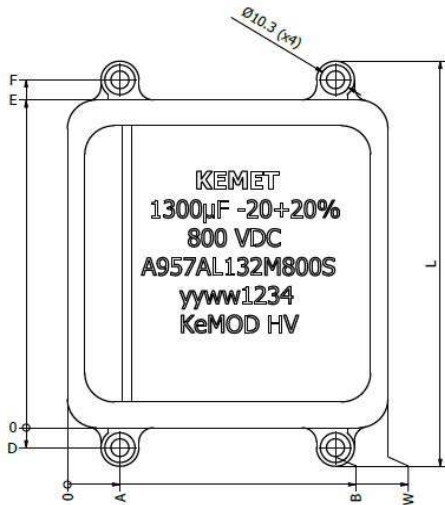
Test Condition	Voltage (VDC)					
$\leq$ 30 second surge followed by a no load period of 330 seconds, 1,000 cycles at +85°C	700	800	900	1,000	1,100	1,200
	770	880	990	1,100	1,210	1,320

## Test Method & Performance

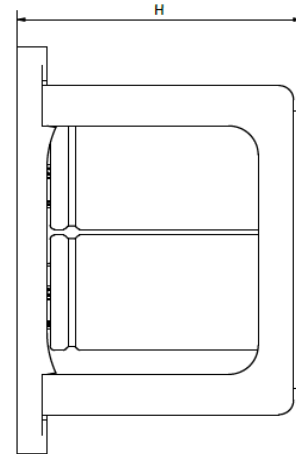
Endurance Life Test	
Conditions	Performance
Temperature	+85°C
Test Duration	2,000 hours
Ripple Current	Rated ripple current specified in table
Voltage	The sum of DC voltage and the peak AC voltage must not exceed the rated voltage of the capacitor
<b>Performance</b>	<b>The following specifications will be satisfied when the capacitor is tested at +20°C:</b>
Capacitance Change	Within 10% of the initial value
Equivalent Series Resistance	Does not exceed 150% of the initial value
Leakage Current	Does not exceed leakage current limit

## Dimensions – Millimeters

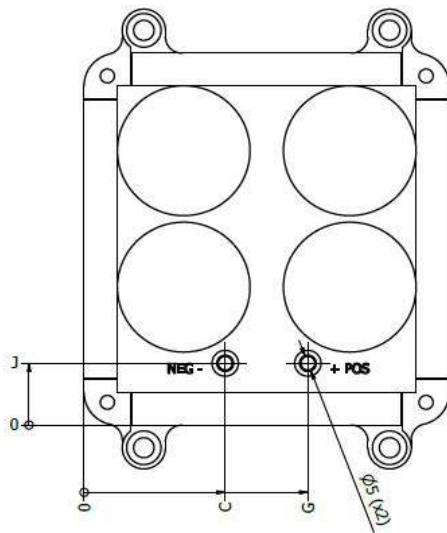
Module Top View



Module Side View



PCB Top View (Without Capacitors)



Size Code	Dimensions											Approximate Weight (g)
	A	B	C	D	E	F	G	H	J	L	W	
	± 0.5	± 0.5	± 0.1	± 0.5	± 0.5	± 0.5	± 0.1	± 0.5	± 0.1	± 0.5	± 0.5	
AL	18.0	92.0	42.5	7.0	114.4	121.4	67.4	96.1	19.0	141.4	110.0	669.3

**Recommended Terminal Screws:**

Slotted Head Hex Screw (M5 x 0.8, 10.0 mm length, 2.0 maximum torque)

Socket Head Steel Screw (M5 x 0.8, 10.0 mm length, 6.0 maximum torque)

Stainless Steel Washer should be used

## 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 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.

## Reliability

Estimated field failure rate:

Size Codes	Estimated field failure rate $\leq$ (ppm)*
AL	1.20

(\*Failures per year/produced number of capacitors per year)

The expected failure rate for this capacitor module range is based on field experience for single capacitors with structural similarity.

## Environmental Compliance



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

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 world wide and makes 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.

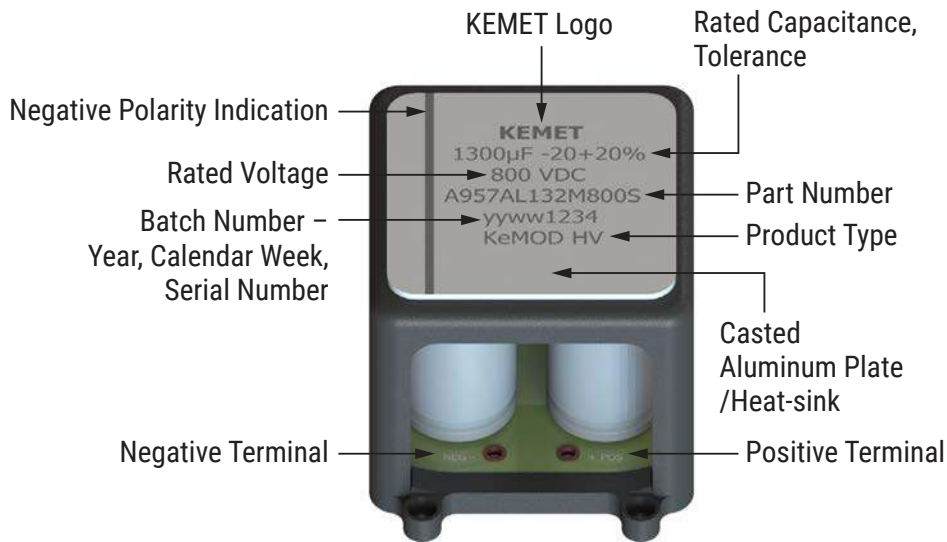
Due to customer requirements, there may appear additional markings such as lead-free (LF) or lead-free wires (LFW) on the label.

**Table 1 – Ratings & Part Number Reference**

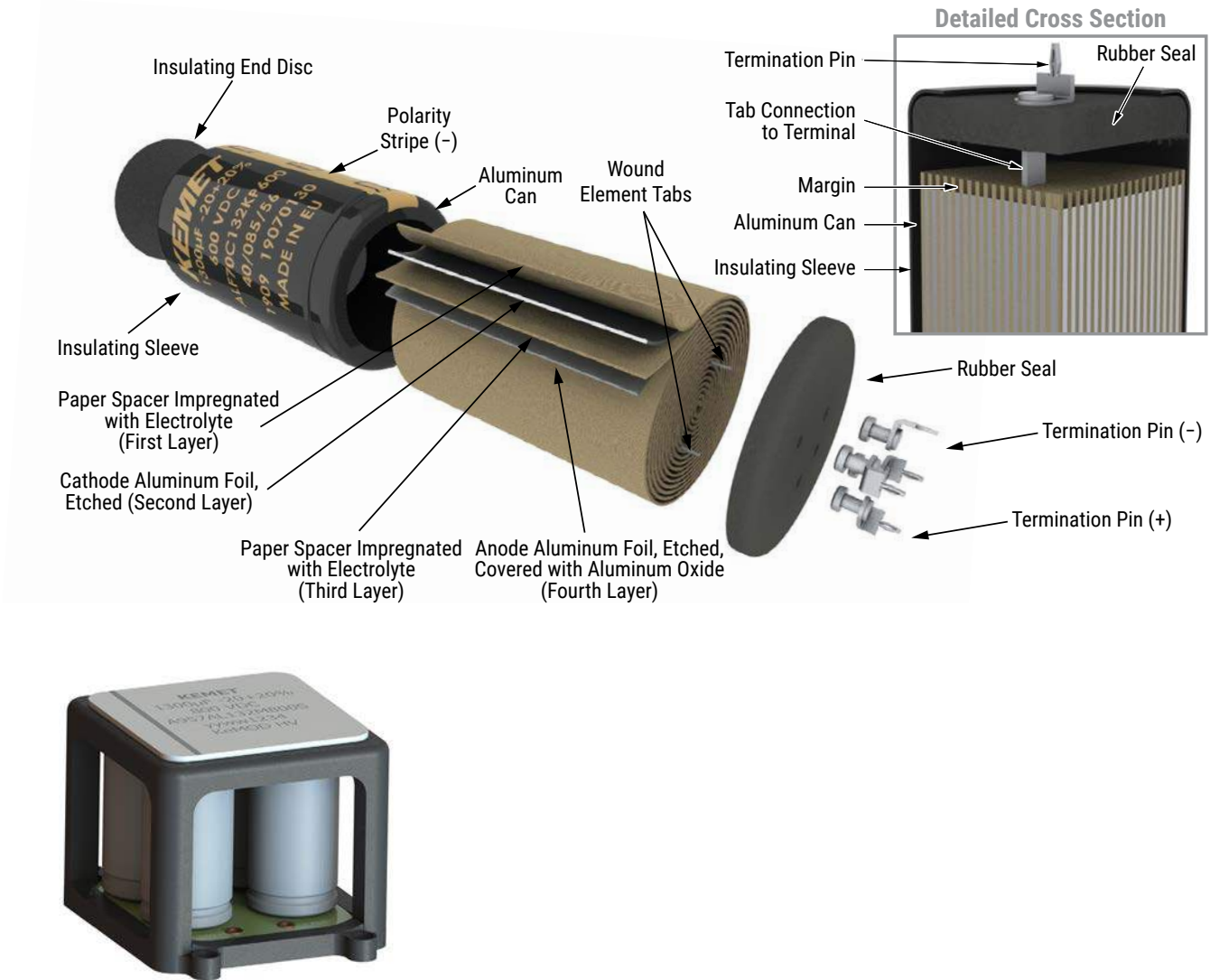
Rated Voltage (VDC)	Rated Capacitance 100 Hz 20°C (µF)	Size Code	Case Size L x W x H (mm)	Ripple Current		ESR Maximum		Impedance Maximum 10 kHz 20°C (mΩ)	Part Number
				100 Hz 85°C (A) <sup>1</sup>	10 kHz 85°C (A) <sup>1</sup>	100 Hz 20°C (mΩ)	10 kHz 20°C (mΩ)		
700	1,800	AL	141.4 x 110.0 x 96.1	15.20	29.70	84	43	A957AL182M700S	
800	1,300	AL	141.4 x 110.0 x 96.1	13.20	27.20	114	66	A957AL132M800S	
900	1,000	AL	141.4 x 110.0 x 96.1	11.93	23.03	209	150	A957AL102M900S	
1,000	910	AL	141.4 x 110.0 x 96.1	10.46	15.87	484	421	A957AL911M1K0S	
1,100	620	AL	141.4 x 110.0 x 96.1	11.19	22.26	214	149	A957AL621M1K1S	
1,200	560	AL	141.4 x 110.0 x 96.1	10.65	21.64	241	166	A957AL561M1K2S	

<sup>1</sup> Module ambient temperature

**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 winding is assembled to the capacitor Al-can and to the Al-lid. The can is filled with electrolyte and the winding is impregnated during a vacuum treatment. The capacitor is 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 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 carried out at elevated temperature and is accomplished by applying voltage to the device while carefully controlling the supply current. The process takes between 2 and 20 hours, depending on voltage rating.

Damage to the oxide layer can occur due to a variety of reasons:

- Slitting of the anode foil after forming
- Attaching the tabs to the anode foil
- Minor mechanical damage caused during winding

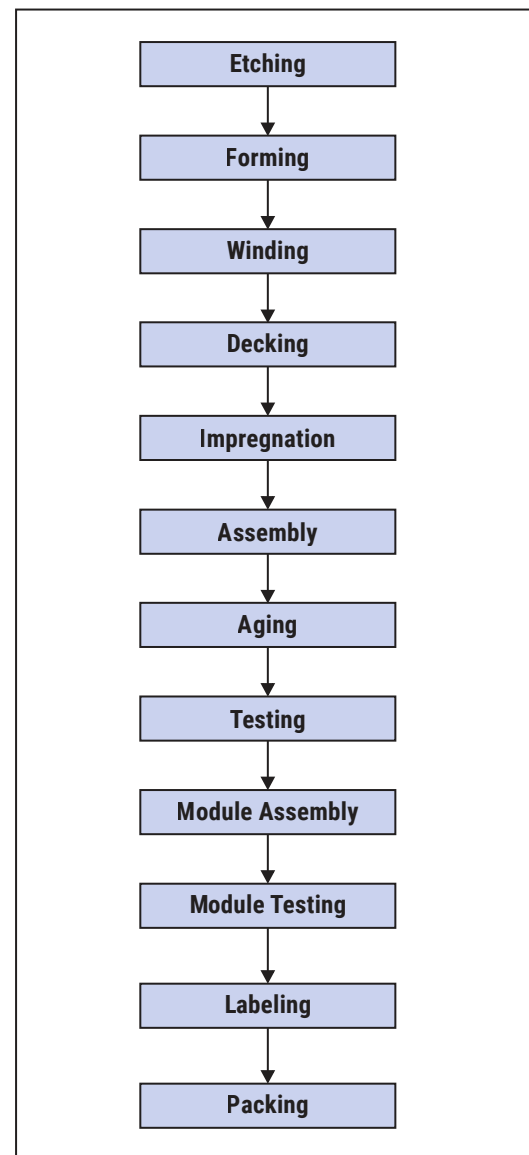
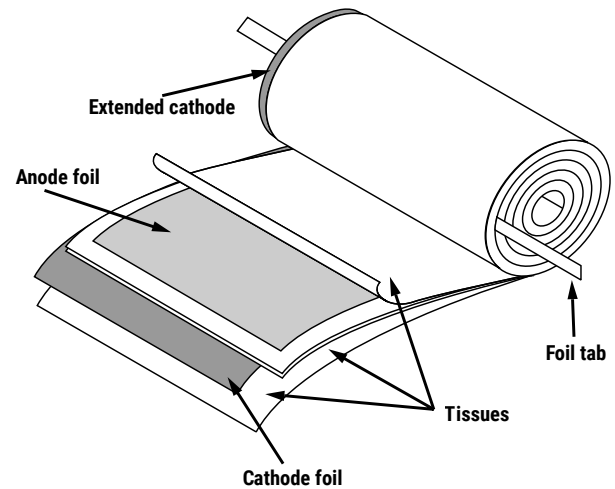
The following tests are applied for each individual capacitor.

Electrical:

- Leakage current
- Capacitance
- ESR
- Tan Delta

Mechanical/Visual:

- Pull strength test of wire terminals
- Print detail
- Box labels
- Packaging, including packed quantity



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