

Aluminum Electrolytic Capacitor Module

A958, +105°C, High Voltage



Overview

KEMET's A958 is an electrolytic capacitor module with outstanding electrical performance and high ripple current. This device contains a bank of ALF80 Aluminum Electrolytic Capacitors mounted on high current designed PCB. These assembled parts are housed by a plastic case and heat sunk 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 9,000 hours at +105°C (V_R, I_R applied)
- Extremely high ripple current
- Low ESL
- Outstanding electrical performance

Applications

The KEMET A958 is an electrolytic capacitor module, designed mainly for applications, like Solar Inverters, Motor Drives, and Pulsed Power.



Part Number System

A	958	AL	112	M	800	S
Capacitor Class	Series	Size Code	Capacitance Code (μ 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	S = Screw

Performance Characteristics

Item	Performance Characteristics	
Capacitance Range	820 – 1,300 μ F	
Rated Voltage	700 – 900 VDC	
Operating Temperature	–40 to +105°C	
Storage Temperature Range	–55 to +105°C	
Capacitance Tolerance	\pm 20% at 100 Hz/+20°C	
Operational Lifetime	Rated Voltage and Ripple Current at +105°C (hours)	Rated Voltage at +105°C (hours)
	9,000	14,000
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 μ A (whichever is smaller)	
	C = rated capacitance (μ 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 Δ C/C \pm 5%
Standards	IEC 60384–4 long life grade 40/105/56	

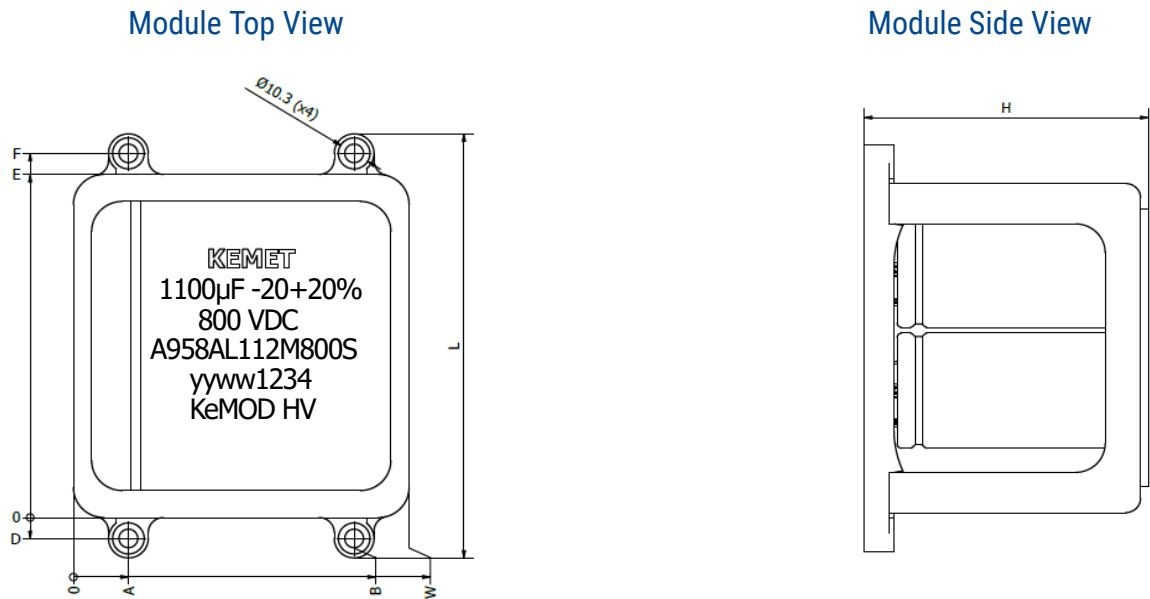
Surge Voltage

Test Condition	Voltage (VDC)		
\leq 30 second surge followed by a no load period of 330 seconds, 1,000 cycles at +105°C	700	800	900
	770	880	990

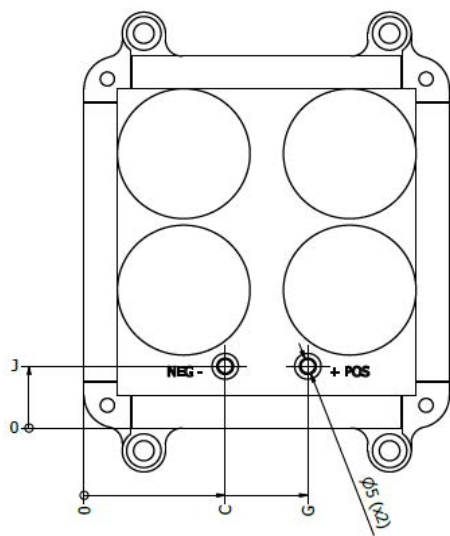
Test Method & Performance

Endurance Life Test	
Conditions	Performance
Temperature	+105°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
Performance	The following specifications will be satisfied when the capacitor is tested at +20°C:
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



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 ≤ (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.

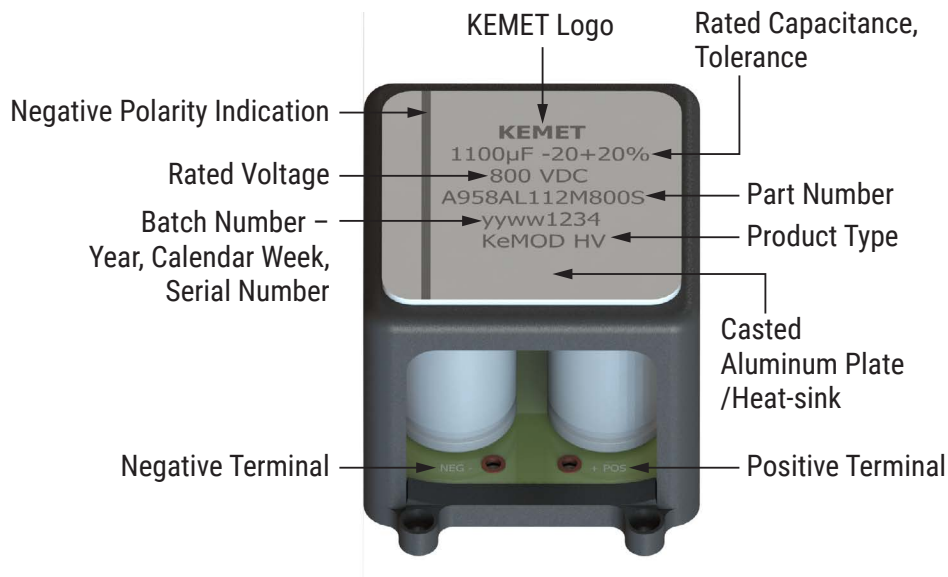
Due to customer requirements, there may appear additional markings such as lead-free (LF) or lead-free wires (LFW) on the label.

Table 1 – Ratings & Part Number Reference

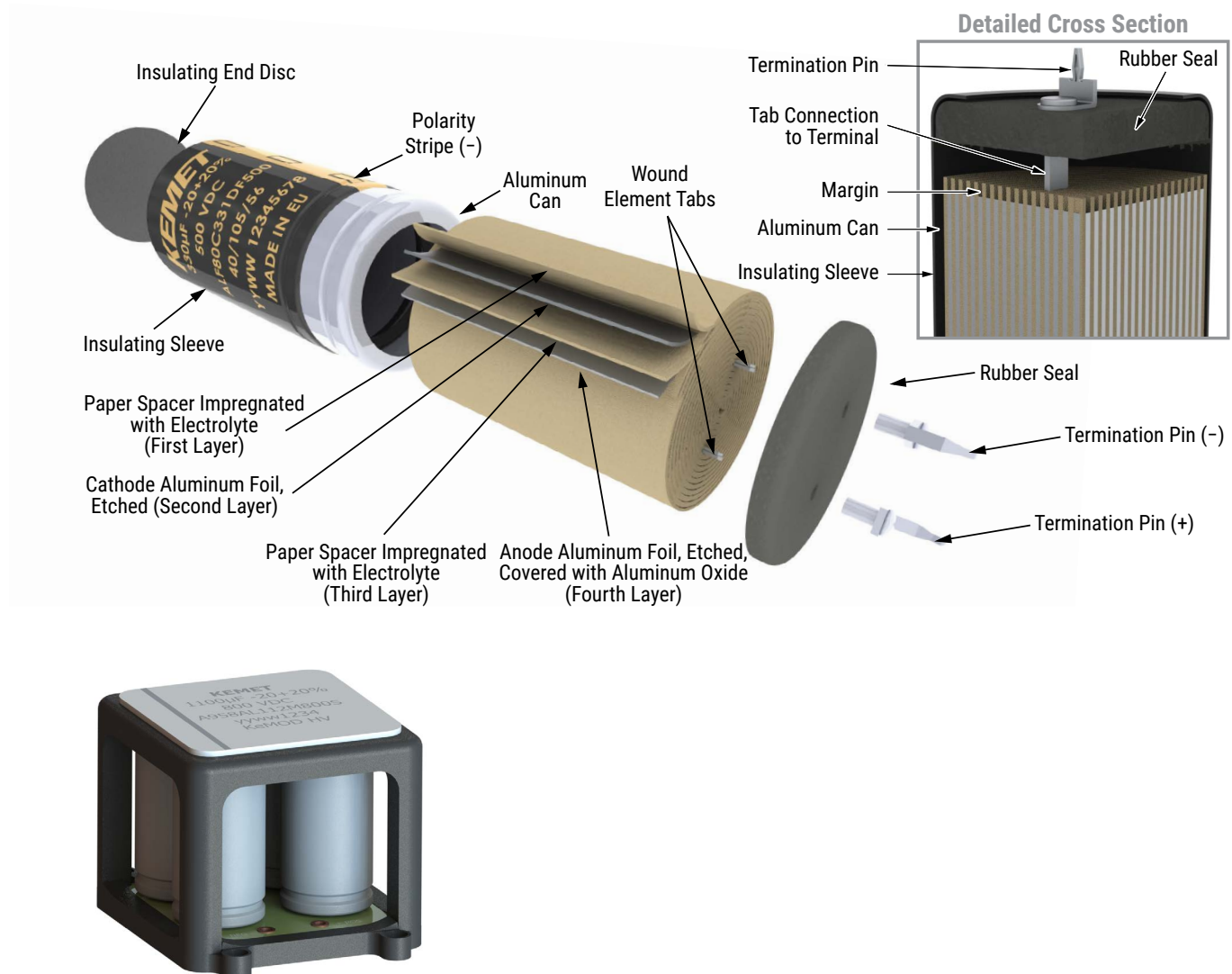
Rated Voltage	Rated Capacitance	Size Code	Case Size	Ripple Current		ESR Maximum	Impedance Maximum	Part Number
(VDC)	100 Hz 20°C (μF)		L x W x H (mm)	100 Hz 105°C (A) ¹	10 kHz 105°C (A) ¹	100 Hz 20°C (mΩ)	10 kHz 20°C (mΩ)	
700	1,300	AL	141.4 x 110.0 x 96.1	12.0	27.0	101	54	A958AL132M700S
800	1,100	AL	141.4 x 110.0 x 96.1	11.6	26.4	125	74	A958AL112M800S
900	820	AL	141.4 x 110.0 x 96.1	10.5	23.4	215	150	A958AL821M900S

¹ 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

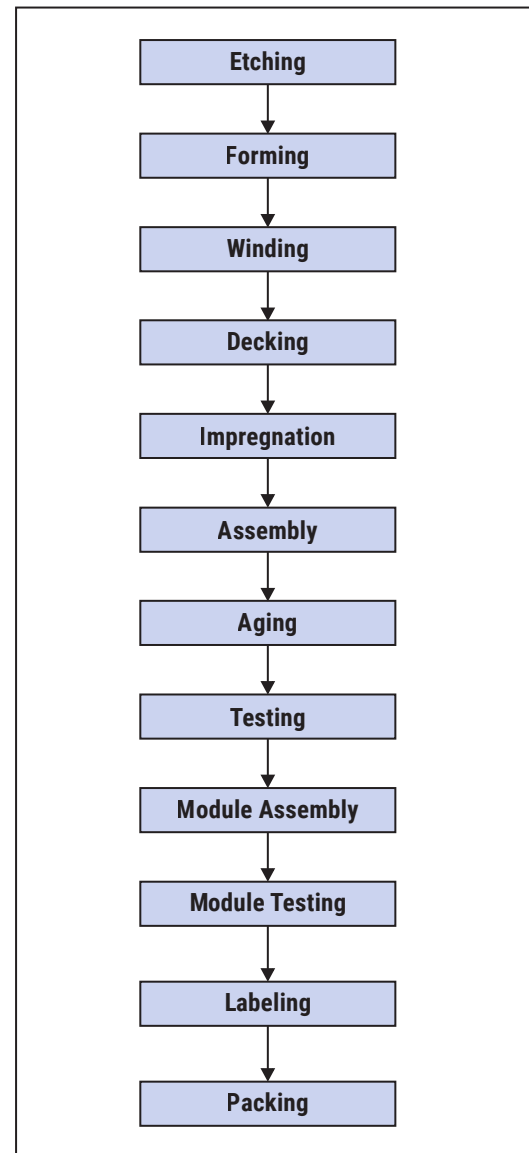
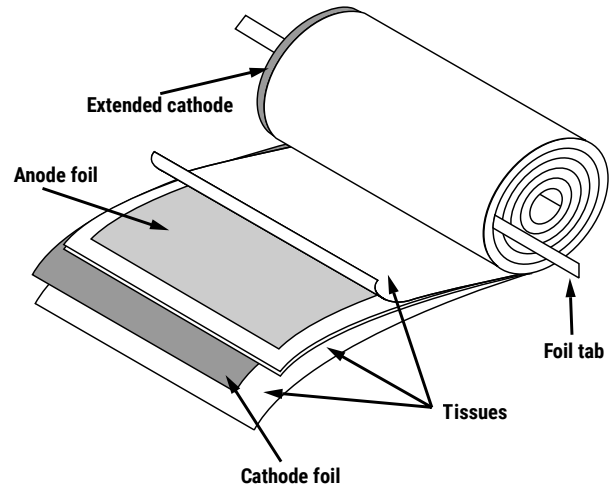
The following tests are applied for each individual capacitor.

Electrical:

- Leakage current
- Capacitance
- ESR
- Tan Delta

Mechanical/Visual:

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



KEMET Electronics Corporation Sales Offices

For a complete list of our global sales offices, please visit www.kemet.com/sales.

Disclaimer

YAGEO Corporation and its affiliates do not recommend the use of commercial or automotive grade products for high reliability applications or manned space flight.

All product specifications, statements, information and data (collectively, the "Information") in this datasheet are subject to change. The customer is responsible for checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or implied.

Statements of suitability for certain applications are based on KEMET Electronics Corporation's ("KEMET") knowledge of typical operating conditions for such applications, but are not intended to constitute – and KEMET specifically disclaims – any warranty concerning suitability for a specific customer application or use. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by KEMET with reference to the use of KEMET's products is given gratis, and KEMET assumes no obligation or liability for the advice given or results obtained.

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 indicated or that other measures may not be required.

KEMET requires its products to be packaged and shipped on pallets. This is because KEMET's products are specifically designed to be packed onto pallets during shipment. If for any reason, the products are removed from pallets by the shipping party and shipped to the end customer, then additional external protection is required. In this instance, an external box with two carton layers and an upwards orientation sticker must be used by the shipping party, with the empty space filled with filling material, and afterwards sealing the box. If this packing and packaging guideline is not followed by the shipping party, the shipping party, and not KEMET, will be held responsible for any packaging, packing and/or product damages upon delivery of the products to the end customer. KEMET hereby disclaims any liability for damages to the products or otherwise that have been, or threaten to be, inflicted, result from or are in any way related to the packaging, packing or damage by the shipping party in contravention of the packing and packaging guidelines herein.

KEMET is a registered trademark of KEMET Electronics Corporation.