

TO Messrs. ALMAR ENTERPRISES CO., LTD,

# ALUMINUM ELECTROLYTIC CAPACITORS SPECIFICATION SHEET

**Halogen Free**

CUSTOMER PART No.		
Rubycon PART No.	16 ZLH 1500 M HFC 10X20	
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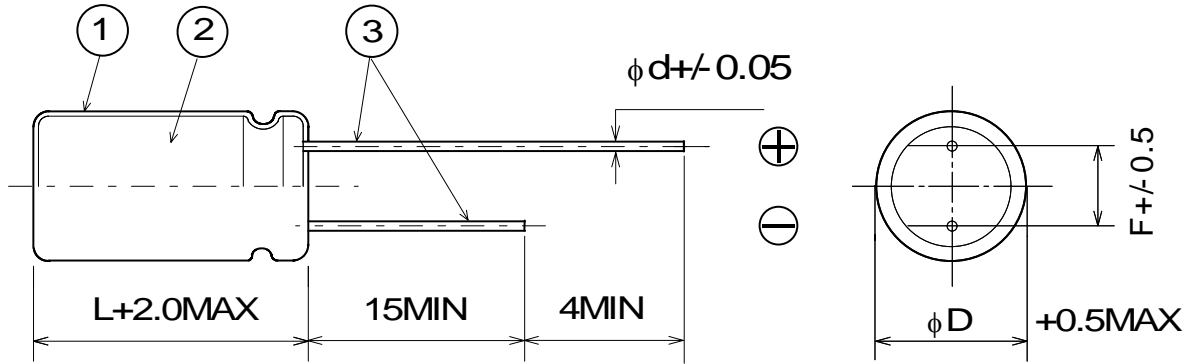
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ALUMINUM ELECTROLYTIC CAPACITORS	Style	CE 04	
	Operating Temperature Range	-40°C ~ +105°C	
	Reference Standard	JIS C 5141 JIS C 5102	
16 WV	1500 MFD (ZLH SERIES)	①Sleeve	P.E.T.
		②Case	Aluminum
		③Lead Wire	CP Wire Tin plated

1. Dimensions unit : mm



2. Electrical Performance


Table-1

NOMINAL CAPACITANCE (μF)	CAPACITANCE TOLERANCE (%) 20°C, 120Hz	RATED VOLTAGE (V.DC)	SURGE VOLTAGE (V.DC)	LEAKAGE CURRENT (μA MAX) 20°C	D.F. tan δ MAX 20°C 120Hz	MAX RIPPLE CURRENT (mA rms) 105°C 100kHz
				2min		
1500	-20~+20	16	20	240	0.16	1960

IMPEDANCE (ΩMAX) 100kHz		IMPEDANCE RATIO 120Hz		DIMENSIONS (mm)			
20°C	-10°C	Z-25°C/Z20°C	Z-40°C/Z20°C	φD	L	F	φd
0.020	0.060	2	3	10	20	5.0	0.6

3. Marking : Unless otherwise specified, capacitor shall be clearly marked the following items on its body.

Sleeve color : Black  
Lettering color : White

- |                                   |   |
|-----------------------------------|---|
| (1) Trade mark                    | <b>Rubycon</b>  |
| (2) Rated Voltage                 | 16V   |
| (3) Nominal Capacitance           | 1500μF  |
| (4) Polarity                      |  (Negative Polarity) |
| (5) Series                        | ZLH   |
| (6) Date Code                     |   |
| (7) Maximum Operating temperature | 105°C   |
| (8) PET sleeve mark               | PET   |

4. Vent

On capacitors whose diameter is 6.3mm and greater, a safety vent shall be provided.

ZLH SERIES	<b>Rubycon</b> RUBYCON CORPORATION
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## 5. Load life test

Capacitor under the test shall be applied the rated voltage continuously through 1000 ohm series protective resistor (with maximum ripple current) at  $105\pm 2^{\circ}\text{C}$  for  $10000^{+72}_0$  hours. After the test and returned in standard condition for 2 hours or more, and the capacitor shall meet following requirements.

- Capacitance Change : within  $\pm 25\%$  of the initially measured value.
- Dissipation Factor : less than 200% of the specified value.
- Leakage Current : less than the specified value.
- Appearance : notable changes shall not be found.  
(except sleeve condition)

## 6. Shelf life test

Capacitors shall be stored at  $105\pm 2^{\circ}\text{C}$  with no voltage applied for  $1000^{+48}_0$  hours. After the test and returned in standard condition for 1 to 2 hours and the capacitor shall meet following requirements. (If any doubt arises on the judgment, the capacitors shall be subjected to voltage treatment specified in JIS C 5141,5.2.)

- Capacitance Change : within  $\pm 25\%$  of the initially measured value.
- Dissipation Factor : less than 200% of the specified value.
- Leakage Current : less than the specified value.
- Appearance : notable changes shall not be found.

## 7. Correction factor for ripple current

The maximum permissible ripple current is the maximum A.C. current at 100kHz and can be applied at maximum operating temperature. The combined value of D.C. voltage and the peak A.C. voltage shall not exceed the rated voltage and shall not be reverse voltage.

## &lt; Frequency Coefficient &gt;

Freq. (Hz)	120	1k	10k	$\geq 100\text{k}$
Multiplier	0.60	0.80	0.96	1.00

## &lt; Temperature Coefficient &gt;

Ambient Temperature( $^{\circ}\text{C}$ )	105	85	$65\geq$
Coefficient	1.0	1.7	2.1

◇ Temperature coefficient shows a limit of ripple current exceeding the rated ripple current that can be passed through a capacitor at each temperature when the life expectancy of a capacitor becomes to be nearly equal with the lifetime at the rated maximum operating temperature.

◇ Ripple voltage with wide amplitude

Use of aluminum electrolytic capacitor under ripple voltage with wide amplitude is equivalent to quick charge-discharge operation. When ripple voltage with the amplitude over 70Vp-p is expected for the products with rated voltage over 100V, please contact us.

## 8. Notes on use of aluminum electrolytic capacitors

## (1) Charge and discharge

Do not use for the circuit that repeats quick charge or discharge.

## (2) External stress

Do not apply excessive force of pushing, pulling bending, and/or twisting to the main body, lead wire and terminals.

## (3) Heat resistance at soldering process

In the soldering process of PC board with Capacitors mounted, secondary shrinkage or crack of sleeve may be observed when soldering temperature is too high and/or soldering time is too long.

If lead wire of other components or pattern of double sided PC board touches the capacitor, the similar failure may be also originated at pre-heating, heating at hardening process of adhesive and soldering process.

## (4) Insulation and PC board mounting

Sleeve is for marking purpose only.

It is not recognized as insulation materials.

When double sided PC board is employed, note that it could cause a short circuit if lead wire of other components or pattern of double sided PC board touches capacitor. Please avoid circuit pattern runs underneath capacitor.

In addition, case and cathode terminal are not insulated.

## (5) Adhesives and coating materials

Do not use the adhesives and coating materials that contain halogenated organic solvents or chloroprene as polymer.

## (6) Storage

Keep at a normal temperature and humidity. During a long storage time, leakage current will be increased. To prevent heat rise or any trouble that high leakage current possibly causes, voltage treatment is recommended for the capacitors that have been stored for a long time.

## &lt;Storage Condition&gt;

\*Aluminum electrolytic capacitors should not be stored in high temperatures or where there is a high level of humidity. The suitable storage condition is 5°C-35°C and less than 75% in relative humidity.

\*Aluminum electrolytic capacitors should not be stored in damp conditions such as water, saltwater spray or oil spray.

\*Do not store aluminum electrolytic capacitors in an environment full of hazardous gas (hydrogen sulfide, sulfurous acid gas, nitrous acid, chlorine gas, ammonia or bromine gas).

\*Aluminum electrolytic capacitors should not be stored under exposure to ozone, ultraviolet rays or radiation.

## (7) Fumigation and halogenated flame retardant

It may cause corrosion of internal electrodes, aluminum cases and terminal surface when the following conditions exist.

\*Fumigation of wooden pallets before shipment to disinfect vermin.

\*Existence of components or parts that contain halogenated flame retardant agent (bromine etc.) together with capacitors.

\*When halogenated detergents or antiseptics for preventing infection of epidemic diseases contact directly to capacitors.

## (8) PC board cleaning after soldering

Please consult us when cleaning is subjected.

◆ Guide to application except the above are described in our catalog and EIAJ RCR-2367C.

EIAJ RCR-2367C: "Safety Application Guide for fixed aluminum electrolytic capacitors for use in electronic equipment."

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