

**Messrs.**  
\_\_\_\_\_

Date

2019.05.09

Approval No.

843 - 2155

SYQD(SHENZHEN YAZE)

# **APPROVAL SHEET**

*Aluminum electrolytic capacitors*

Catalog Type	DH 475 LG2G 225 T (Ø50 x 110L)
User Part No.	
Applied To	
Reference	RoHS

**Samyoung Electronics Co.,Ltd.**

**General manager of product engineering group**

**CHOI SEONG ROK**



**User Approval**

Approval No. : \_\_\_\_\_

**Address**

**KOREA** 47, Sagimakgol-ro, Jungwon-gu, Seongnamsi, Gyeonggi-do

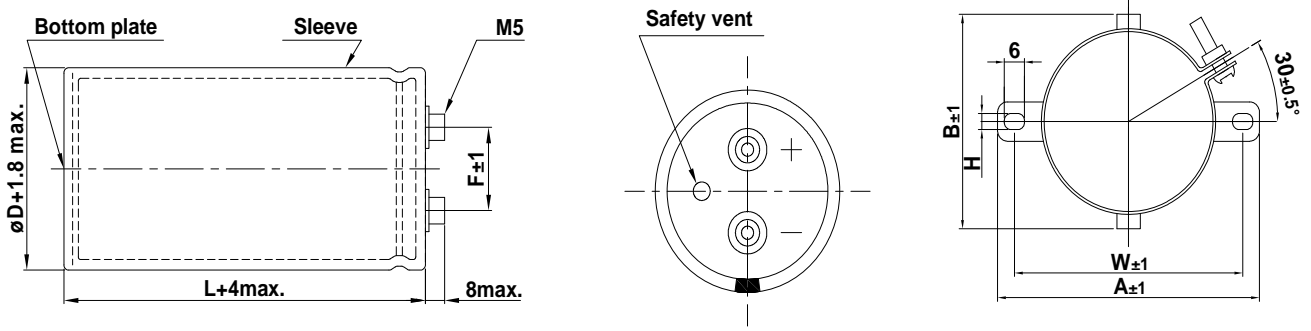
**CHINA** No.5 Changjiang Road Pingdu-city, Shandong-province



**SamYoung Electronics Co., Ltd.**

<b>ALUMINUM ELECTROLYTIC CAPACITORS</b>	<b>APPROVAL NO.</b> <b>843 - 2155</b>	
	<b>SERIES</b>	<b>DH</b>
	<b>RATING</b>	<b>475 V 225 <math>\mu</math>F</b>
<b>DH 475 LG2G 225 (T)</b>	<b>CASE SIZE</b>	<b><math>\varnothing</math> 50 x 110 L</b>

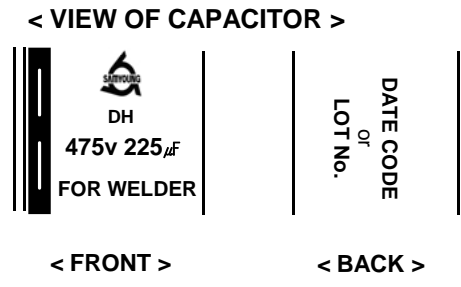
**A. DIAGRAM OF DIMENSION** [ UNIT : mm ]



$\varnothing$ D	L	F
50	110	22.4

A	B	W	H
78	64	68	4.5

**B. MARKING: BLACK SLEEVE & SILVER INK**



< LOT No. : Sleeve or bottom plate marking. >

①②③④  
or  
①②  
③④

①: The ending figure of manufactured year in A.D.  
②: Manufactured month (1,2,3,...,9,O,N,D)  
③: Manufactured day (A,B,C,...,Z,a,b,c,d,e)  
④: SAMYOUNG's Korea : 1, China : <1>

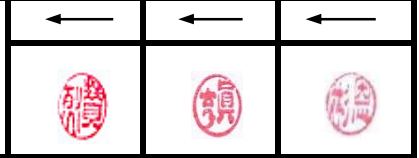
< DATE CODE : Sleeve marking. >

①②③④

①②: YEAR : The ending of A.D.  
③④: WEEKS : 01 ~ 52

**C. ELECTRICAL CHARACTERISTICS**

- A. OPERATING TEMPERATURE RANGE : **-25 ~ +70°C**
- B. RATED VOLTAGE : **475 V<sub>DC</sub>**
- C. SURGE VOLTAGE : **500 V<sub>DC</sub>**
- D. CAPACITANCE TOLERANCE : **-10 ~ +50%** at 20°C, 120Hz
- E. LEAKAGE CURRENT : Lower **3000  $\mu$ A**, after 5 minutes at 20°C
- F. DISSIPATION FACTOR (TAN  $\delta$ ) : Lower **0.15** at 20°C, 120Hz
- G. TEMPERATURE CHARACTERISTICS :  **$C(-10^\circ\text{C}) / C(20^\circ\text{C}) \geq 0.8$**  (at 120Hz)  
(capacitance change)
- H. LOAD LIFE : The following specifications shall be satisfied when the capacitors are restored to 40°C, after the rated working voltage applied. And than charge and discharge (charge 0.8sec. Discharge 0.2sec) are repeated **1,000,000** times. And than the capacitors are restored to 20°C after the measurements.
  - # Capacitance change :  $\leq \pm 20\%$  of the initial value
  - # Tan  $\delta$  :  $\leq 200\%$  of the initial value
  - # Leakage current :  $\leq 200\%$  of the initial specified value
- I. CLEANING CONDITIONS : Non-solvent proof → Refer to Cleaning conditions (Page 5)
- J. OTHERS : Satisfied characteristics KS C IEC 60384-4



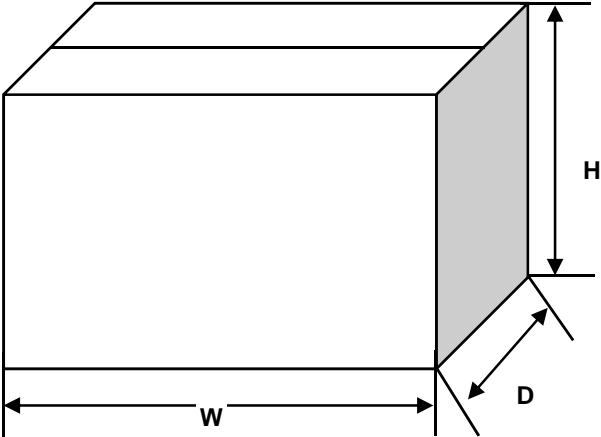
# ALUMINUM ELECTROLYTIC CAPACITOR

APPROVAL NO.  
**843 - 2155**

## ► PACKING SPEC

[ UNIT: mm ]

### 1) BOX FORM



### 2) PACKING QUANTITY AND BOX DIMENSION

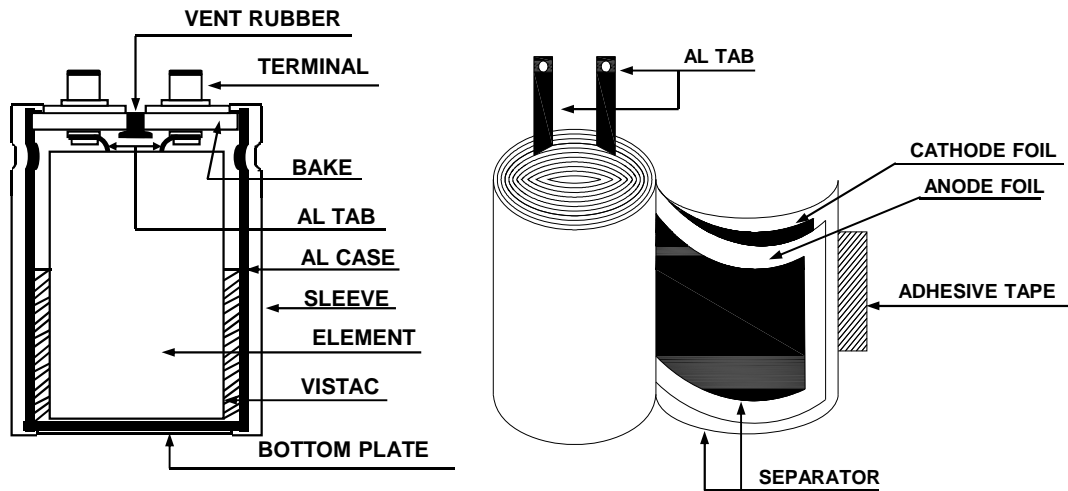
CASE SIZE		INNER BOX	QUANTITY (PCS)
ØD	L	SIZE (W × D × H)	
50	110	415 × 425 × 110	32

## ALUMINUM ELECTROLYTIC CAPACITORS

APPROVAL NO.

843 - 2155

## ► STRUCTURE AND MATERIALS



## ※ LARGE SIZED TYPE CAPACITORS COMPONENT

PART NAME	MATERIALS	VENDER
TERMINAL	ALUMINUM 99.7 %	NOK (JAPAN) MECTRON (KOREA/CHINA)
BAKE	PHENOL	NAN TONG TOP (CHINA)
AL TAB	ALUMINUM 99.9 % OVER	KISTRON (KOREA) SAMYOUNG DONG YANG (JAPAN)
SLEEVE	PVC (POLY VINYL CHLORIDE)	MOODEUNG (KOREA/CHINA) YUN LIN PLASTIC SHUN PENG PLASTIC (CHINA) SUZHOU QILIAN
BOTTOM PLATE	P.P (Polypropylene)	SUNG NAM (KOREA)
AL CASE	ALUMINUM 99.5 %	SPEEFOX / DONG NAM (KOREA) SUNLIT (JAPAN) LINAN AOXING NANTONG XINLIAN / HAI BANG (CHINA) PONTIGGIA (ITALIA)
ANODE FOIL	FORMED ALUMINUM 99.9 % OVER	SAM YOUNG (KOREA) K.D.K / JCC / MATSUSHITA (JAPAN) BECROMAL (ITALY) SATMA (FRANCE) HUAFENG / NANTONG / RAOIO / HAIYUAN YINGKELAI / HUARONG / HEC (CHINA) XINJIANG JOINWORLD LUXON / LITON (TAIWAN)
CATHODE FOIL	ETCHED ALUMINUM 99.8 % OVER	K.D.K (JAPAN) K-JCC (KOREA) AFT / INCULCU / SHENGHONG ELECON / WU JIANG FEILO (CHINA)
SEPARATOR	INSULATION PAPER	N.K.K (JAPAN) GLT (GERMANY) KAN (CHINA)
ADHESIVE TAPE	POLY PROPYLENE OR POLY IMIDE FILM	DAI IL / SWECO (KOREA) NITTO / NICHIBAN (JAPAN)



## PRECAUTIONS AND GUIDELINES TO USERS

When using aluminum electrolytic capacitors, pay strict attention to the following:

**1. Electrolytic capacitors for DC application require polarization.**

Confirm the polarity. If used in reversed polarity, the circuit life may be shortened or the capacitor may be damaged. For use on circuits whose polarity is occasionally reversed, or whose polarity is unknown, use bi-polarized capacitors(BP-series). Also, note that the electrolytic capacitor cannot be used for AC application.

**2. Do not apply a voltage exceeding the capacitor's voltage rating.**

If a voltage exceeding the capacitor's voltage rating is applied, the capacitor may be damaged as leakage current increases. When using the capacitor with AC voltage superimposed on DC voltage, care must be exercised that the peak value of AC voltage does not exceed the rated voltage.

**3. Do not allow excessive ripple current to pass.**

Use the electrolytic capacitor at current values within the permissible ripple range. If the ripple current exceeds the specified value, request capacitors for high ripple current applications.

**4. Ascertain the operating temperature range.**

Use the electrolytic capacitors according to the specified operating temperature range. Usage at room temperature will ensure longer life.

**5. The electrolytic capacitor is not suitable for circuits in which charge and discharge are frequently repeated.**

If used in circuits in which charge and discharge are frequently repeated, the capacitance value may drop, or the capacitor may be damaged. Please consult our engineering department for assistance in these applications.

**6. Apply voltage treatment to the electrolytic capacitor which has been allowed to stand for a long time.**

If the electrolytic capacitor is allowed to stand for a long time, its withstand voltage is liable to drop, resulting in increased leakage current. If the rated voltage is applied to such a product, a large leakage current occurs and this generates internal heat, which damaged the capacitor. If the electrolytic capacitor is allowed to stand for a long time, therefore, use it after giving voltage treatment .

**7. Be careful of temperature and time when soldering.**

When soldering a printed circuit board with various components, care must be taken that the soldering temperature is not too high and that the dipping time is not too long. Other wise, there will be adverse effects on the electrical characteristics and insulation sleeve of electrolytic capacitors in the case of small-sized electrolytic capacitors, nothing abnormal will occur if dipping is performed at less than 260 °C for less than 10 seconds.

**8. Do not place a soldering iron body of the capacitor.**

The electrolytic capacitor is covered with a vinyl sleeve. If the soldering iron comes in contact with the electrolytic capacitor body during wiring, damage to the vinyl sleeve and/or case may result in defective insulation, or improper protection of the capacitor element.

**9. Cleaning circuit boards after soldering.**

Some solvents have adverse effects on capacitors.  
Please refer to the next page.

**10. Do not apply excessive force to the lead wires or terminals.**

If excessive force is applied to the lead wires and terminals, they may be broken or their connections with the internal elements may be affected. (For strength of terminals, refer to KS C IEC 60384-4 (JIS C5101-1, JIS C5101-4) )

**11. Care should be used in selecting a storage area.**

If electrolytic capacitors are exposed to high temperatures caused by such things as direct sunlight, the life of the capacitor may be adversely affected. Storage in a high humidity atmosphere may affect the solderability of lead wires and terminals.

**12. Surge voltage**

The surge voltage rating is the maximum DC over-voltage to which the capacitor may be subjected for short periods not exceeding approximately 30 seconds at infrequent intervals of not more than six minutes. According to KS C IEC 60384-4, the test operating temperature for the capacitors of characteristics KS C IEC 60384-4 with voltage applied through a series resistance of 1000 ohms without discharge. The electrical characteristics of the capacitor after the test are specified in KS C IEC 60384-4.

Unless otherwise specified, the rated surge voltages are as follows:

Rated Voltage(WV)	4	6.3	10	16	25	35	50	63	80	100	160	200	250	315	350	400	420	450	500	550	600
Surge Voltage(SV)	5	8	13	20	32	44	63	79	100	125	200	250	300	365	400	450	470	500	550	600	650

**Note 1** Voltage treatment ... Treat them with appropriate voltage before using. As treating method, it is used current density less than specified leakage current in room temperature.

- 1) 80% of rated voltage applied and keep 1 hour after reaching 80% of rated voltage.
- 2) 90% of rated voltage applied and keep 1 hour after reaching 90% of rated voltage.
- 3) 100% of rated voltage applied and keep 1 hour after reaching 100% of rated voltage.

**Note 2** For methods of testing, refer to KS C IEC 60384-4. (JIS C 5101-1, JIS C 5101-4)



## CLEANING CONDITIONS

Aluminum electrolytic capacitors that have been exposed to halogenated hydrocarbon cleaning and defluxing solvents are susceptible to attack by these solvents. This exposure can result in solvent penetration into the capacitors, leading to internal corrosion and potential failure.

Common type of halogenated cleaning agents are listed below.

Chemical Name	Structural Formula	Representative Brand Name
Trichlorotrifluoroethane	C <sub>2</sub> Cl <sub>3</sub> F <sub>3</sub>	Freon TF , Daiflon S-3
Fluorotrichloromethane	CCl <sub>3</sub> F	Freon -11 , Daiflon S-1
1,1,1-Trichloroethane	F <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub>	Chloroethane
Trichloroethylene	C <sub>2</sub> HCl <sub>3</sub>	Trichlene
Methyl Chloride	CH <sub>3</sub> Cl	MC

We would like to recommend you the below cleaning materials for your stable cleaning condition taking the place of previous materials.

◎ Isopropyl Alcohol(IPA) or water

Cleaning method : One of immersion, ultrasonic or vapor cleaning

Maximum cleaning time : 5 minutes (Chip type : 2 minutes)

※ Do not use AK225AES

Aluminum electrolytic capacitors are easily affected by halogen ions, particularly by chloride and bromine ions.

Excessive amounts of halogen ions, if happened to enter the inside of the capacitors, will give corrosion accidents-rapid capacitance drop and vent open. The extent of corrosion accidents varies with kinds of electrolytes and seal-materials. Therefore, the prevention of halogen ion contamination is the most important check point for quality lines, At present, halogenated hydrocarbon-contained organic solvents such as Trichloroethylene, 1,1,1-Trichloroethane, and Freon are used to remove flux from circuit boards.

If electrolytic capacitors are cleaned with such solvents, they may gradually penetrate the seal portion and cause the erosion.

When using latex-based adhesive on the capacitor's rubber end seal for adhesion to a PCB, corrosion may occur depending on the kind of solvent in the adhesive. Select an adhesive as an organic solvent with dissolved polymer that is not halogenated hydrocarbon. Hot air drying is required for eliminating the solvent between the product and the PCB at 50℃~80℃ after coating.

Followings are the penetration path of the halogenated solvent.

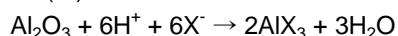
- ① Penetration between the rubber and the aluminum case
- ② Penetration between the rubber and the lead wire
- ③ Penetration through the rubber

The inside of the capacitors, the mechanism of corrosion of aluminum electrolytic capacitors by halogen ions can be explained as follows:

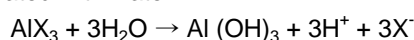
Halides (RX) are absorbed and diffused into the seal portion. The halides then enter the inside of the capacitors and contact with the electrolyte of the capacitors, whereby halogen ions are made free by a hydrolysis with water in the electrolyte:



The halogen ions (X<sup>-</sup>) react with the dielectric substance (Al<sub>2</sub>O<sub>3</sub>) of aluminum electrolytic capacitors:



AlX<sub>3</sub> is dissociated with water:



※ **MANUFACTURING SITE**

- SamYoung Electronics Co., Ltd. ( Korea / China )

