

CUSTOMER : 順和

Doc No : MES003545

Rev : A0

RoHS Comp.

Halogen Free

# 承認書

## APPROVAL SHEET

Specifications description : **AP CAP 470uF-2V ESR6**  
**7.3X4.3X1.9mm ±20%,2000hrs**

APAQ P/N : **ACAH2R0S471E06**

Customer P/N :

Date	Approved by	Checked by

Approved by Customer  
(Signing or stamping here) :

Approved Date :



鈺邦科技股份有限公司  
APAQ TECHNOLOGY CO., LTD

竹南科學園區  
苗栗縣竹南鎮科東三路 2&6 號 4 樓  
4F., No.2 & 6, Kedong 3rd Rd., Chunan  
Science Park, Miaoli County 350,  
Taiwan ,( R.O.C.)

# AP-CAP ACAH SERIES SPECIFICATION

## 1. Application

This specification shall be specified to chip type conductive polymer aluminum solid electrolytic capacitors of ACAH series.

## 2. Product Identification

ACAH   2R0   S   471   E06   □  
 ①            ②            ③            ④            ⑤            ⑥

① Product Code

② Rated Voltage                      2R0 : 2.0V , 2R5 : 2.5V

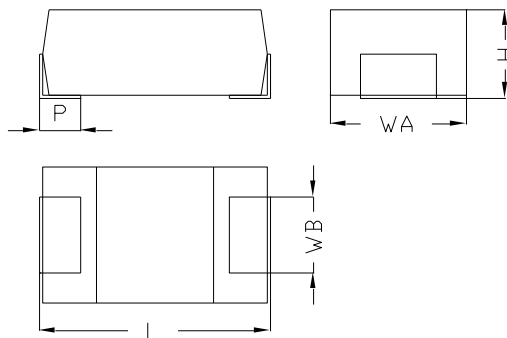
③ Case Height                         S : 1.9 mm

④ Capacitance                         471 : 470  $\mu$ F

⑤ ESR                                     E06 : 6 m $\Omega$   
     E04 : 4.5 m $\Omega$

⑥ Suffix for special code    Y : Capacitance +10 ~ -35%

## 3. Configuration and Dimensions



unit : mm

Case size	L	WA	WB	H	P
S	7.3 $\pm$ 0.3	4.3 $\pm$ 0.3	2.4 $\pm$ 0.2	1.9 $\pm$ 0.3	1.3 $\pm$ 0.2

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF APAQ TECHNOLOGY CO. LTD AND SHALL NOT BE REPRODUCT OR USED AS THE BASIC FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION.



鈺邦科技股份有限公司

APAQ TECHNOLOGY CO., LTD

DESIGNED BY : 藍上哲

DRAWN BY : 呂姿儀

CHECKED BY : 藍上哲

APPROVED BY : 陳明宗

TITLE : AP-CAP ACAH SERIES SPECIFICATION

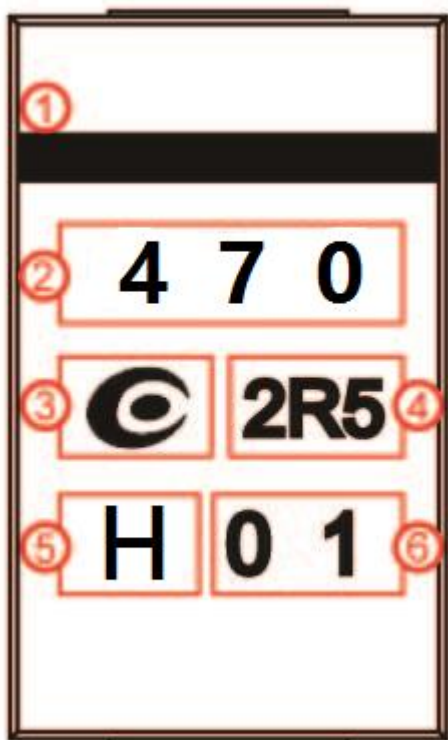
DOCUMENT NO.

MES003545

REV

A0

#### 4. Marking



- ① : Polarity Bar (+)
- ② : Rated Capacity
- ③ : Company Logo
- ⑤ : Rated Voltage
- ⑤ : Year (G for 2015 · H for 2016 · I for 2017)
- ⑥ : Week

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF APAQ TECHNOLOGY CO. LTD AND SHALL NOT BE REPRODUCT OR USED AS THE BASIC FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION.



鈺邦科技股份有限公司

APAQ TECHNOLOGY CO., LTD

DESIGNED BY : 藍上哲

DRAWN BY : 呂姿儀

CHECKED BY : 藍上哲

APPROVED BY : 陳明宗

TITLE : AP-CAP ACAH SERIES SPECIFICATION

DOCUMENT NO.

MES003545

REV

A0

## 5. Specifications

### 5.1 Ratings

WV(VDC)	Cap (μF)@120Hz	tanδ Max. @120Hz	Leakage Current Max. (μA)	ESR Max. (mΩ) @100kHz	Ripple Current (A r.m.s) @100kHz	Part No.
2	470	0.06	94.0	9.0	6.3	ACAH2R0S471E09
	470	0.06	94.0	9.0	6.3	ACAH2R0S471E09Y
	<b>470</b>	<b>0.06</b>	<b>94.0</b>	<b>6.0</b>	<b>7.5</b>	<b>ACAH2R0S471E06</b>
	470	0.06	94.0	5.0	8.5	ACAH2R0S471E05
	470	0.06	94.0	4.5	8.5	ACAH2R0S471E04
	470	0.06	94.0	3.0	10.2	ACAH2R0S471E03
2.5	470	0.06	117.5	9.0	6.3	ACAH2R5S471E09
	470	0.06	117.5	9.0	6.3	ACAH2R5S471E09Y
	470	0.06	117.5	6.0	7.5	ACAH2R5S471E06
	470	0.06	117.5	4.5	8.5	ACAH2R5S471E04
	470	0.06	117.5	3.0	10.2	ACAH2R5S471E03
3.2	330	0.06	105.6	6.0	7.5	ACAH3R2S331E06
4	220	0.06	176.0	9.0	6.3	ACAH4R0S221E09

Temperature Compensation Multipliers for Ripple Current		
$\leq 45^{\circ}\text{C}$	$45^{\circ}\text{C} < T \leq 85^{\circ}\text{C}$	$85^{\circ}\text{C} < T \leq 105^{\circ}\text{C}$
1.0	0.7	0.25

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF APAQ TECHNOLOGY CO. LTD AND SHALL NOT BE REPRODUCT OR USED AS THE BASIC FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION.



鈺邦科技股份有限公司

APAQ TECHNOLOGY CO., LTD

DESIGNED BY : 藍上哲

DRAWN BY : 呂姿儀

CHECKED BY : 藍上哲

APPROVED BY : 陳明宗

TITLE : AP-CAP ACAH SERIES SPECIFICATION

DOCUMENT NO.

MES003545

REV

A0

## 5.2 Environmental Performance

Item	Conditions	Characteristics	
Category Temperature Range		-55 to +105 °C	
Rated Voltage Range		2 V.DC to 4 V.DC	
Capacitance Tolerance	at 20°C, 120Hz	±20 % (M) ; Y : +10 ~ -35%	
Leakage Current	at 20°C after 2 minutes	$I \leq 0.1CV$ (2 V.DC to 3.2V.DC) $I \leq 0.2CV$ (4 V.DC) I : Leakage Current(μA), C : Rated Capacitance(μF), V : Rated Voltage(V)	
Surge Voltage	15°C to 35°C	Rated voltage × 1.25	
Dissipation Factor (tanδ)	at 20°C · 120Hz	Case Height : S Type, 0.06 max.	
Endurance	105°C, rated voltage applied, 2000 hrs	Appearance	No significant damage
		Capacitance Change	±20% of initial value
		Dissipation Factor	≤ 200% of the initial specified value
		Leakage Current	2 V.DC to 3.2 V.DC ≤ 300% of the initial specified value 4 V.DC ≤ the initial specified value
Damp Heat, Steady State	60°C, 90 to 95%RH, 500 hrs	Appearance	No significant damage
		Capacitance Change	(2V.DC to 4V.DC) +70%, -20% of the initial value
		Dissipation Factor	≤ 200% of the initial specified value
		Leakage Current	within the initial specified value
Surge Voltage	The capacitors shall be subjected to 1000 cycles each consisting of charge with the surge voltages, 125% rated voltage, at 15°C to 35°C for 30 seconds through a protective resistor(R=1KΩ)and discharge for 5min 30 seconds.	Appearance	No significant damage
		Capacitance Change	±10% of the initial value
		Dissipation Factor	within the initial specified value
		Leakage Current	within the initial specified value
Solderability	Pb-free solder Around 25% rosin melted ethanol or isopropylalcohol Temperature : 245 ± 5 °C Immersing time : 2 ± 0.5 s	More than 95% of outer terminal surface to be covered	
Resistance to Solvents	Solvent : isopropylalcohol Immersing time : 30 ± 5 s Room temperature	No significant damage and marking readable	
Shelf life	Test temperature: 105±2°C Test time: 500hrs.	Appearance	No significant damage
		Capacitance Change	±10% of the initial value
		Dissipation Factor	within the initial specified value
		Leakage Current	within the initial specified value

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF APAQ TECHNOLOGY CO. LTD AND SHALL NOT BE REPRODUCT OR USED AS THE BASIC FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION.



鈺邦科技股份有限公司

APAQ TECHNOLOGY CO., LTD

DESIGNED BY : 藍上哲

DRAWN BY : 呂姿儀

CHECKED BY : 藍上哲

APPROVED BY : 陳明宗

TITLE : AP-CAP ACAH SERIES SPECIFICATION

DOCUMENT NO.

MES003545

REV

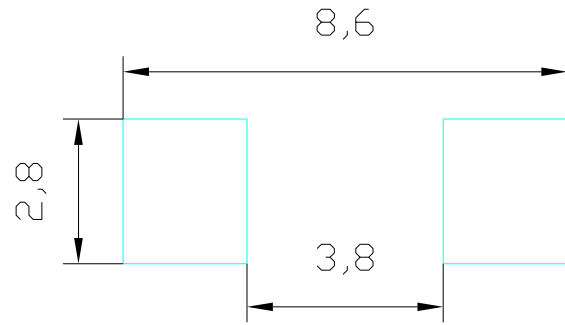
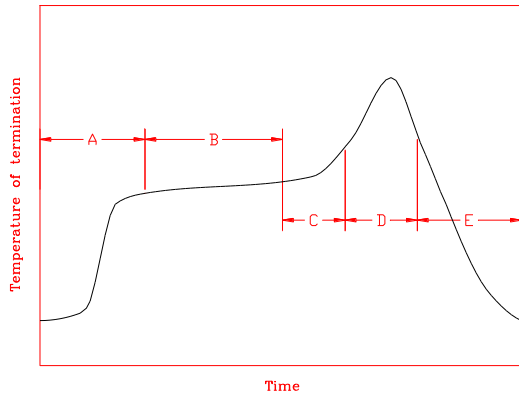
A0

### 5.3 Mechanical Performance

Item	Conditions	Characteristics	
Vibration	Test for 2 hours each in the directions of X-Y-Z at the frequency of 10 to 2000 Hz and amplitude of 1.5 mm(10-2000-10).	Appearance	No significant damage
		Capacitance Change	±10% of the initial value
		Dissipation Factor	within the initial specified value
		Leakage Current	within the initial specified value
Shear Force	Side push direction Force : 5 N Holding time : 10 ± 0.5s	No significant damage in appearance	

### 6. Reflow Condition

### Recommended Pad Layout(mm)



A	1 <sup>st</sup> rising temperature	The normal to Preheating temperature	30s to 60s
B	Preheating	140°C to 160°C	60s to 120s
C	2 <sup>nd</sup> rising temperature	Preheating to 200°C	20s to 40s
D	Main heating	217°C 260°C	90s 10s
E	Regular cooling	200°C to 100°C	1°C/s ~ 4°C/s
<b>Reflow Cycle: 1 times</b>			

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF APAQ TECHNOLOGY CO. LTD AND SHALL NOT BE REPRODUCT OR USED AS THE BASIC FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION.



鈺邦科技股份有限公司

APAQ TECHNOLOGY CO., LTD

DESIGNED BY : 藍上哲

DRAWN BY : 呂姿儀

CHECKED BY : 藍上哲

APPROVED BY : 陳明宗

TITLE : AP-CAPACAH SERIES SPECIFICATION

DOCUMENT NO.

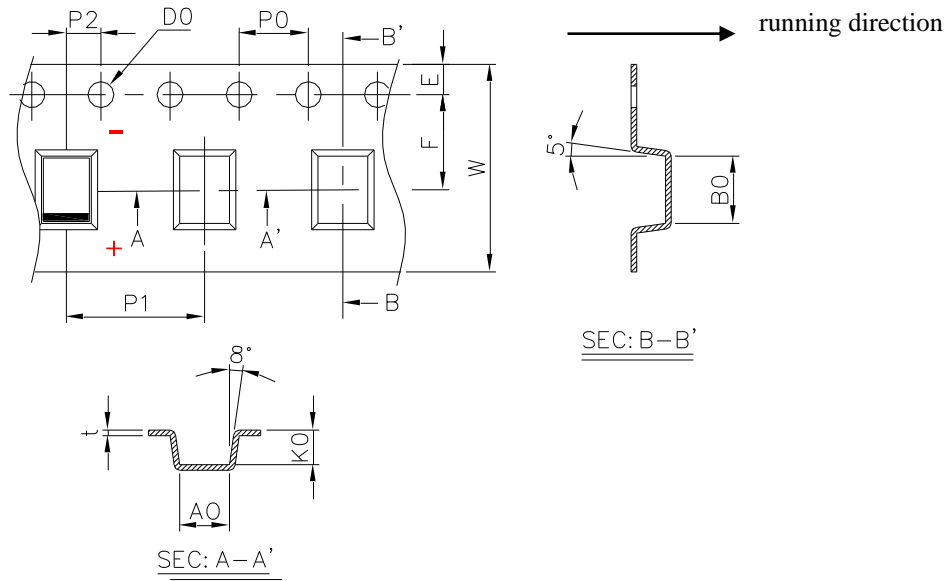
MES003545

REV

A0

## 7. Taping Packing and Label Marking

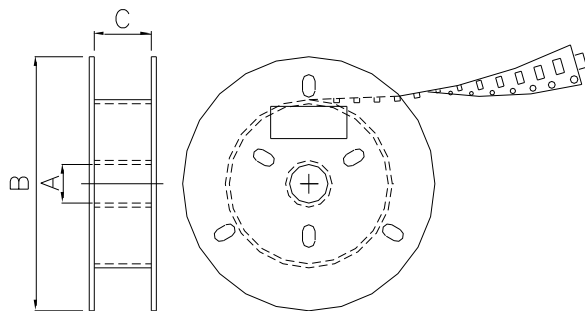
### 7.1 Carrier Tape Dimensions



unit : mm

	W	P1	E	F	D0	P0	P2	A0	B0	K0	t
Dimension	12.00	8.00	1.75	5.50	1.50	4.00	2.00	5.00	7.60	2.30	0.24
Tolerance	±0.10	±0.10	±0.10	±0.10	+ 0.10 - 0.00	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10

### 7.2 Taping Reel Dimensions



Reel Dimension (mm)		
A	B	C
13.2±0.3	330±1.0	13.5±0.5

### 7.3 Label Marking

The label specified as follows shall be put on the side of reel.

- (1) Part No.
- (2) Quantity. (3.5 kpcs / reel)
- (3) Lot No.

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF APAQ TECHNOLOGY CO. LTD AND SHALL NOT BE REPRODUCED OR USED AS THE BASIC FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION.



鈺邦科技股份有限公司

APAQ TECHNOLOGY CO., LTD

DESIGNED BY : 藍上哲

DRAWN BY : 呂姿儀

CHECKED BY : 藍上哲

APPROVED BY : 陳明宗

TITLE : AP-CAPACAH SERIES SPECIFICATION

DOCUMENT NO.

MES003545

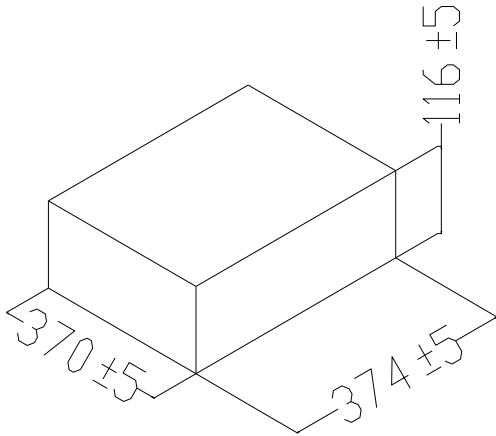
REV

A0

#### 7.4 Dimension of inner and outer carton box

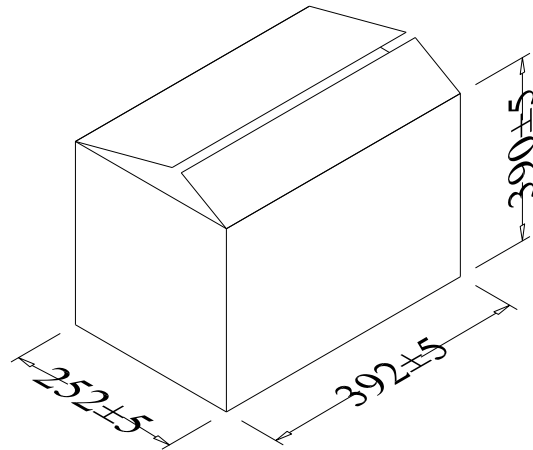
3.5kpcs capacitors were packed in a taping reel, 6 reels were packed in a inner carton box (W374\*D370\*H116mm) and 2 inner carbon box were packed in a outer shipping carton box (W392\*D252\*H390mm), 42kpcs capacitors in a outer carton box.

Inner Carton Box



unit : mm

Outer Carton Box



unit : mm

#### 8. Precautions for Handling

**8.1 Storage :** All AP-Cap series are classified as MSL-3 (Moisture Sensitivity Level 3).

Product should be packaged in a moisture barrier bags with desiccant and moisture indicator card. The recommended storage condition is as below.


Temperature: 5 °C to 30 °C

Humidity: Less than 60 % RH

The maximum storage period is no more than 1 year before opening bags, and capacitors should be used within 7 days after opening bags. If these conditions are exceeded, the product may absorb moisture and have damage risk to the exterior by heat stress during mounting. Those product should be baked again before mounting, and APAQ's recommended baking conditions follow the standard of IPC/JEDEC J-STD-033.

**8.2 Environment :** Capacitors are not subject to direct contact with water, salt water, chemically gas, acidic and alkaline environment.

**8.3 Disposal :** Treat Capacitors as industrial waste because they consist of various metals and resin.

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF APAQ TECHNOLOGY CO. LTD AND SHALL NOT BE REPRODUCT OR USED AS THE BASIC FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION.		 鈺邦科技股份有限公司 APAQ TECHNOLOGY CO., LTD	
DESIGNED BY : 藍上哲	DRAWN BY : 呂姿儀	CHECKED BY : 藍上哲	APPROVED BY : 陳明宗
TITLE : AP-CAPACAH SERIES SPECIFICATION		DOCUMENT NO. MES003545	REV
			A0