

## **FEATURES**

- Low Self Discharge/Up to 10 times energy density compared to standard Super Capacitors
- High Capacitance, Energy Storage
- 4.0V High Operating Voltage
- RoHS Directive Compliant

#### **APPLICATIONS**

• Continuous power support, Back up power, Stand alone or augment existing , Medical backup power/alarm, Water and gas smart meters, Electronic cigarette.

## **OPERATING TEMPERATURE RANGE**

- +350°C(4-5 seconds by soldering)
- No clean soldering recommended.
- Do not wash the super capacitors.



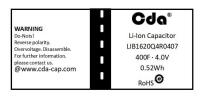
## **GENERAL SPECIFICATIONS**

Item	Performance					
Operating temperature	-20°C to +65°C					
Storage temperature	-40°C to +85°C					
Capacitance range	nge 200F to 1100F					
Rated voltage	4.0 VDC					
Minimum rated voltage	2.5 VDC					
Surge voltage	4.2 VDC					
Temperature characteristics	Capacitance change: Within ±50% of initial measured value at +25°C (-20°C to +70°C)					
remperature characteristics	Internal resistance: Within ±800% of initial measured value at +25°C (at -20°C)					
	After 1000 hours:					
High temperature load time	Capacitance change: ±30% of initial rated value					
	Internal resistance: Within 3 times of initial specified value					
Projected cycle life	After 30,000 cycles:					
(From rated voltage to 1/2 rated	Capacitance change: Within ±30 % of initial rated value					
voltage at 25°C)	Internal resistance: Within 2 times of initial specified value					
Shelf life	After 2 years at 25°C without load, the capacitor shall meet the specified endurance limits.					

## **PART NUMBER SYSTEM**

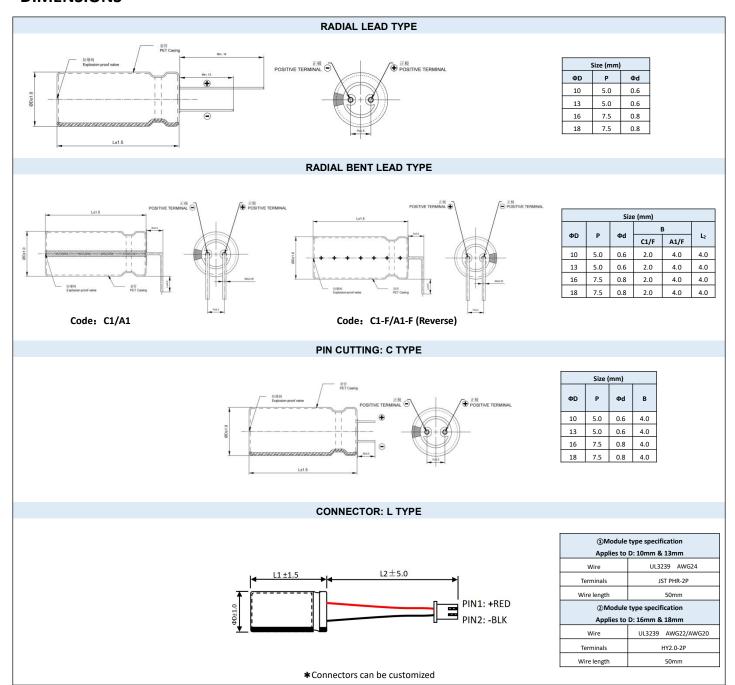
LIB	1840	Q	<u>3R8</u>	<u>118</u>	***	
Series	Size Code	Cylindrical Code	Rated Voltage	Nominal Capacity	Special Code	

## **Casing Display:**





## **DIMENSIONS**



## **STANDARD PRODUCTS**

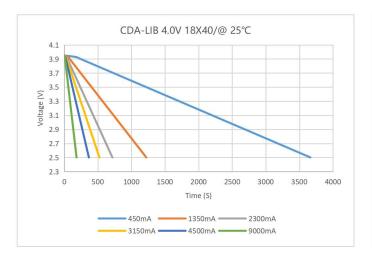
Part Number	Dimensions (mm) Rated		4.0V-2.5V Capacitance Battery	ESRAC (mΩ)	Leakage Current	Rated Current	Max Current	Weight/Unit	Energy Storage		
rait Nullibei	D	L	Cap. (F)	Tolerance	Cap. (mAh)	(11KHz)	(72hrs/mA)	(A)	(A)	(grams)	(W.h)
LIB1030Q4R0207	10	30	200	-10%~+30%	90	180	0.003	0.4	4.0	6.0	0.27
LIB1320Q4R0227	13	20	220	-10%~+30%	100	200	0.003	1.0	5.0	5.0	0.30
LIB1330Q4R0357	13	30	350	-10%~+30%	150	100	0.004	1.5	20.0	8.0	0.48
LIB1340Q4R0507	13	40	500	-10%~+30%	200	130	0.005	4.0	28.0	8.0	0.68
LIB1620Q4R0407	16	20	400	-10%~+30%	160	200	0.015	2.0	15.0	8.5	0.52
LIB1840Q4R0118	18	40	1100	-10%~+30%	450	65	0.023	6.0	40.0	20.0	1.49

<sup>\*</sup> operating temperature can be extended to 85°C with appropriate voltage.

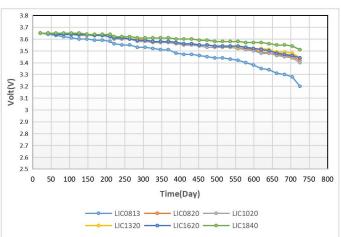


## THE FEATURE DIAGRAM

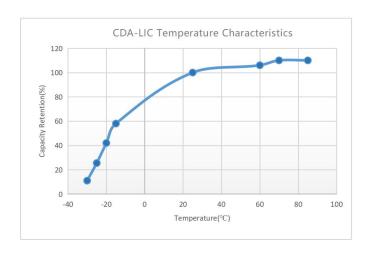
#### Discharge multiplier characteristics

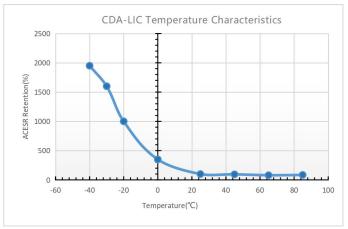


#### LIC two-year self-discharge data

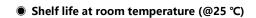


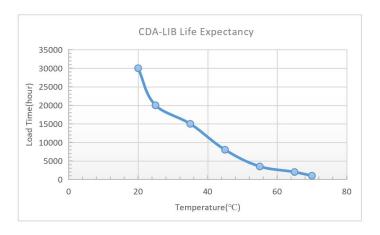
## Representative average temperature characteristics of capacitance and ESR.

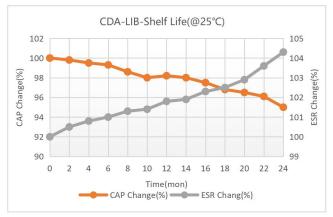




## • Lifetime estimation at different temperatures.









#### \*To ensure safety, prohibited matters when using.



#### • Do not charge under high current or high voltage conditions.

Charging under high current or high voltage conditions may cause the electrolyte inside the capacitor to boil, generating gas and increasing internal pressure, which could lead to risks such as fire, overheating, leakage, or rupture of the capacitor.

#### • Do not expose to fire for heating or disassembly.

Heat may damage insulating materials, potentially causing risks such as fire, overheating, leakage, or rupture of the capacitor.

#### • Do not solder directly onto the capacitor body.

Heat exposure may damage insulating materials, potentially leading to risks such as fire, overheating, leakage, or rupture of the capacitor.

• Do not connect the positive (+) and negative (-) terminals of the capacitor with metal wires, or transport or store it with metal items such as necklaces or pins.

This may short-circuit the capacitor, resulting in excessive discharge current and posing risks such as fire, overheating, leakage, or rupture of the capacitor.

## • Please correctly use the positive (+) and negative (-) terminals of the capacitor.

Reverse charging or other abnormal reactions may occur, which could lead to risks such as fire, overheating, electrolyte leakage, or rupture of the capacitor.

#### • Do not force discharge the capacitor.

When forced discharge occurs due to an external power source or other capacitors, the voltage may drop below 0V (polarity reversal), generating gas inside the capacitor and causing expansion. This can result in fire, rupture, or combustion.

- If the capacitor leaks or emits an unusual odor, immediately move away from any open flames or sparks, as the leaked electrolyte may cause a fire.
- When disposing of or storing capacitors, ensure insulation using tape or other methods.

Improper storage or mixing capacitors with other metals may cause a short circuit, leading to fire, overheating, rupture, or even personal injury and fire hazards.



- If liquid from the capacitor enters the eyes, it may endanger eye safety. Do not rub the eyes; immediately rinse with clean water and seek medical treatment without delay.
- Do not mix new capacitors with used or different types of capacitors.

Due to differences in characteristics, this may lead to risks such as capacitor overheating, leakage, or rupture.

 When connecting two or more capacitors in series or parallel, please contact our company in advance.

Imbalanced load distribution may pose a risk of rupture.

• Do not use or place capacitors in high-temperature environments such as areas with strong direct sunlight or inside vehicles during hot weather.

This may lead to risks of capacitor overheating, leakage, or rupture.

- Do not subject capacitors to strong impacts or throw them.
- This may lead to risks of capacitor overheating, leakage, or rupture.
- Do not expose capacitors to moisture-prone substances such as water.

This may lead to risks of capacitor overheating.

• Avoid storing capacitors in areas exposed to direct sunlight, high temperatures, or high humidity.

This may lead to risks of capacitor overheating.

#### To prevent degradation of functionality

#### • Caution regarding anti-static mats

If capacitors with attached leads or circuit boards after actual installation are placed on anti-static mats, the capacitors may short-circuit, posing a risk of voltage drop.

#### • Caution regarding soldering

When soldering using solder, ensure that the solder does not come into contact with the capacitor body. Additionally, when soldering other components after the capacitor has been installed, take care to prevent solder from contacting the capacitor.

#### • Precautions for Installation Tools

When installing capacitors onto circuit boards, ensure that the installation tools used are made of insulating materials such as resin. If conductive tools are employed, short circuits caused by the tools may lead to a drop in capacitor voltage. Full recovery of the capacitor voltage after a short circuit requires a certain period of time.

# • Precautions Regarding Cleaning Solutions and Drying Temperatures for Circuit Board Rinsing

The type of cleaning solution and drying temperature may affect capacitor functionality. Before using any cleaning solution, please consult our company for guidance.

#### Regarding lithium-ion capacitors, international transportation, and waste disposal

#### • Air Transport, Maritime Transport, Land Transport

Regarding the transportation of lithium capacitors, in accordance with United Nations regulations, the relevant provisions for air, sea, and land transport established by the International Air Transport Association (IATA), the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO), and the Department of Transportation (DOT) must be followed.

The lithium capacitors (single-cell capacitors) produced by our company meet the following conditions (which may vary depending on the mode of transportation, method, and destination country) and can therefore be classified as non-hazardous goods under the aforementioned regulations. For further details, please consult our company.

Caution Label: A label outlining precautions for the use of lithium capacitors (Figure 7.4.D of the IATA Dangerous Goods Regulations) is affixed to the exterior of the packaging box.

Non-Hazardous Goods Declaration: A supplementary document must be submitted, indicating the presence of lithium capacitors, precautions for use in case of packaging damage, and an emergency contact phone number.

Weight limit for bundled packages: under 2.5kg (when using air transport).

Packaging and bundling: To prevent external short circuits, separate each capacitor and package them securely.

**Bundled package drop test:** Conduct a 1.2m drop test, and it must meet the test standards.

#### Disposal

Globally, concerns about environmental protection are increasing, and starting from Europe and America, China has also enacted laws and regulations regarding disposal and recycling. Currently, as regulations vary by country, state, and local municipality, it is necessary to consult the relevant regulatory authorities regarding disposal. For disposal matters, it is necessary to consult the relevant regulatory authorities.



# SAFETY RECOMMENDATIONS 1

#### **WARNINGS**

- To Avoid Short Circuit, after usage or test, Lithium Ion Capacitor voltage needs to discharge to > 2.5V (Not lower than 2.5V)
- Do not Apply Over-voltage, Reverse Charge, Burn or Heat Higher than 150°C, explosion-proof valve may break open.
- Do not Press, Damage or disassemble the Lithium Ion Capacitor, housing could heat to high temperature causing Burns.
- If you observe Overheating or Burning Smell from the capacitor disconnect Power immediately, and do not touch.

#### **REGULATORY**

- MSDS,UN38.3
- RoHS Compliant

#### TRANSPORTATION

Not subjected to US DOT or IATA regulations UN3508, <0.3Wh, Non-Hazardous Goods International shipping description – "Electronic Products –Capacitor"

#### Measuring

- Capacitance, Equivalent series resistance (ESR) and Leakage current are measured
- Leakage current at +20 °C after 72 hour charge and hold.
- Stored energy (mWh) =  $\frac{0.5 \times (V^{2 \min 1} V^{2 \min 2}) \times \mathcal{C}}{3600} \times 1000$
- Peak power (W) =  $\frac{V^2}{4 \times ESR}$
- Pulse current for 1 second from full rate voltage to minimum rated

voltage.(A) = 
$$\frac{(V^{\min 1} - V^{\min 2}) \times C}{(1 + ESR \times C)}$$

• Continuous current with a 15 °C temperature rise. Continuous current (A)

$$= \sqrt{\frac{\Delta T}{ESR \times Rth}}$$

- •Short circuit current is for safety information only. Do not use as operating current.
- Cycling between rated voltage and 2.5 V, 3 second rest at +20 °C.

**Note:** Do not discharge Lithium Ion Capacitor below minimum working voltage.

## PRECAUTIONS DURINGUSE 1

