

**CAUTION FOR PROPER USE OF EDLC**

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**1. CAUTION DURING CIRCUIT DESIGN****1) LOAD LIFE**

- Electric double layer capacitor (capacitor) is limited load life and specified value of load life.
- The load life is approximately doubled when the temperature is reduced 10°C.

**2) CATEGORY TEMPERATURE RANGE**

- Capacitor is established category temperature range. Do not use capacitors at temperature which exceed the specified category temperature range.

**3) CHARACTERISTICS OF TEMPERATURE CHANGE**

- Performance of electrical characteristics of capacitor is affected by variation of operating temperature.

**4) CONDITIONS OF USE**

- The following environment should be avoided when using capacitor.
  - ① Damp conditions such as water, saltwater spray, or oil spray or humidity condensation situations.
  - ② Hazardous gas/fumes such as hydrogen sulfide, sulfurous acid gas, nitrous acid, chlorine gas, ammonia or bromine gas.
  - ③ Exposure to ozone, ultraviolet rays or radiation.
  - ④ Severe vibration or shock which exceeds the condition specified in catalog or specification sheets.

**5) RATED VOLTAGE**

- Capacitor has rated voltage. Do not exceed the rated voltage of capacitor.

**6) POLARITY**

- Capacitor is normally polarized. Ensure the capacitor's polarity before mounting.

**7) VOLTAGE DROPS WHEN DISCHARGE START**

- In the case of the large discharge current, the voltage drop will generate when the discharge begins. Please confirm the discharge current of the circuit and capacitor internal resistance.

**8) CONNECT IN SERIES**

- Voltage balancing is needed to ensure uniform voltage distribution across each capacitor, if capacitors are connected in series to gain higher rated voltage.

**9) APPLIED RIPPLE CURRENT**

- Please note that the capacitor would self-heat and the life deterioration of the capacitor be accelerating, when the large ripple current or the pulse current are applied to the capacitor.

**10) INSULATION**

- Sleeve of capacitor is not recognized as an insulator, and therefore, the standard capacitor should not be used in a place where insulation function is needed. Please consult with Rubycon should you require a higher grade of insulating sleeve.

**11) CONSIDERATION TO ASSEMBLY CONDITION**

- In designing a circuit, the following matters should be ensured in advance to the capacitor's assembly on the printed wiring board (PW board).
  - ① Design the appropriate hole spacing to match the lead pitch of capacitors.
  - ② Do not locate any wiring and circuit patterns directly above the capacitor's vent.
  - ③ Ensure enough free space above the capacitor's vent. The recommended space is specified in the catalog or specification sheets.
  - ④ In case the capacitor's vent is facing the PW board, make a gas release hole on PW board.
  - ⑤ The sealing side of the screw terminal type should not face down in the application. When the capacitors are mounted horizontally, the anode screw terminals must be positioned at the upper side.

**12) CONSIDERATION TO CIRCUIT DESIGN**

- Any copper lines or circuit patterns should not be laid under the capacitor.
- Parts which radiate heat should not be placed close to or reverse side of the capacitors on the PW board.

**13) OTHERS**

- Excessive holes and connection hole between both sides on the PW board should be avoided around or under the mounting area of the capacitors on double sided or multilayer PW board.
- Torque of tightening screw terminals should not exceed the specified maximum value which is described in the specification sheets.
- Consider current balance when 2 or more capacitors are connected in parallel.

**2.CAUTION FOR ASSEMBLING EDLC****1) IN THE ASSEMBLY PROCESS-1**

- Ensure rated voltage and capacitance of the capacitors before mounting.
- Ensure the capacitor's polarity before mounting.
- Do not use the capacitor which has been dropped onto a hard surface.
- Do not use capacitors with damaged or dented cases or seals.

**2) IN THE ASSEMBLY PROCESS-2**

- Capacitors should be mounted after confirmation that hole spacing on PW board matches the lead of the capacitors.
- Avoid excessive force when clinching lead wire during auto-insertion process.
- Avoid excessive shock to capacitors by automatic insertion machine, mounting parts inspection or centering operations.
- Please utilize supporting material such as strap or adhesive to mount capacitors to PC board when it is anticipated that vibration or shock is applied.

**3) SOLDERING**

- Soldering conditions (temperatures, times) should be within the specified conditions which described in the specification sheets.
- In case lead wire reforming is needed due to inappropriate pitch between capacitor and holes on PW board, stress to the capacitor should be avoided.
- In case soldered capacitor has to be withdrawn from the PW board by soldering irons, the capacitor should be removed after solder has melted sufficiently in order to avoid stress to the capacitor or lead wires.
- Soldering iron should never touch the capacitor's body.

**4) FLOW SOLDERING**

- Do not dip capacitor's body into melted solder.
- Soldering condition (preheat, soldering temperature, dipping time) should be within the specified standard which is described in the specification sheets.
- Flux should not be adhered to capacitor's body but only to its terminals.
- Other devices which are mounted near capacitors should not touch the capacitors.

**5) HANDLING AFTER SOLDERING**

- Do not bend or twist the capacitor's body after soldering on PW board.
- Do not pick-up or move PW board by holding the soldered capacitors.
- Do not hit the capacitors and isolate capacitors from the PW board or other device when stacking PW boards in store.

**6) PW BOARD CLEANING AFTER SOLDERING**

- Consult with Rubycon about if cleaning PW board after soldering capacitors.

**7) ADHESIVES AND COATING MATERIALS**

- Do not use halogenated adhesives and coating materials to fix capacitors.
- Flux between the surface of the PW board and sealing of capacitors should be cleaned before using adhesives or coating materials.
- Solvents should be dried up before using adhesives or coating materials.
- Do not cover up all the sealing area of capacitors with adhesives or coating materials, make coverage only partial.

**3.MAINTENANCE**

- Periodical inspection should be carried out for the capacitors, which are used with industrial equipment.
  - ① Visual inspection to check pressure relief open or leakage of electrolyte.
  - ② Electrical characteristics : capacitance, ESR, and other points which are mentioned in the catalog or specification sheets.

**4.EMERGENCY ACTION**

- When the pressure relief vent is open and some gas blows out from the capacitor, please turn the main switch of the equipment off or pull out the plug from the power outlet immediately.
- During pressure relief vent operation, extremely hot gas may blow out from the capacitors. Do not stand close to the capacitors. In case of eye contact, flush the open eye(s) with amount of clean water immediately. In case of ingestion, gargle with water immediately, do not swallow. Do not touch electrolyte but wash skin with soap and water in case of skin contact.

**5.STORAGE CONDITION**

- 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.
- Capacitors should not be stored in damp condition such as water, saltwater spray or oil spray.
- Do not store capacitors in an environment full of hazardous gas (hydrogen sulfide, sulfurous acid gas, nitrous acid, chlorine gas, ammonia or bromine gas).
- Capacitors should not be stored under exposure to ozone, ultraviolet rays or radiation.

**6.DISPOSAL**

- Please take either of the following actions in case of disposal.
  - ① Incineration (high temperature of more than 800°C) after crushing the capacitor's body.
  - ② Consignment to specialists of industrial waste.

**For further details**

Please refer to : JEITA RCR-2370C (Guideline of notabilia for fixed electric double layer capacitors.  
 [Technical Report of Japan Electronics and Information technology Industries Association in March 1995,  
 revised edition in July 2008].

**◆PACKAGE SPECIFICATION**

SIZE	LONG LEAD			
	PACKAGE QUANTITY		STANDARD SHIPPI NG CARTON QUANTITY	
	BULK PACKAGE	ALIGNED PACKAGE	BULK PACKAGE	ALIGNED PACKAGE
φ8	1000	—	8000	—
φ10	1000	—	4000	—
φ12.5	—	500	—	1000
φ16、φ18、φ20	—	200	—	1000
φ22	—	100	—	500

There are some differences between actual package quantity and above list. For screw terminal type , please inquire packing specification to us

**◆Module**

Capacitor Module comprising of number of Electric Double Layer capacitors connected in series and paralld is available upon request. High Voltage Module with balancing circuit to equalized voltage among each capacitor is also available.



**■Application**

- UPS
- Energy recovery device used in train , a heavy industrial machine, an elevator.
- Absorption of an energy fluctuation on Wind-power generation.
- Battery Assist.

Please contact local sales office for detail of module desing