

使用注意事项

1. 电路设计注意事项

1) 关于使用寿命

- 双电层电容器（以下称电容器）有使用寿命上限，并设定有规定寿命。
- 使用温度每下降10°C，寿命可增至2倍。请在能够满足使用寿命的温度以下使用。

2) 工作温度上限

- 电容器设定有工作温度上限。请在工作温度上限以下使用。

3) 温度变化特性

- 根据温度变化，电容器的电特性也会相应地变化。使用时请确认其变化的程度。

4) 使用环境

- 在以下环境中使用电容器，可能造成其故障。
 - ① 直接溅水、盐水，油或处于结露状态的环境。
 - ② 充满有害气体（硫化氢、亚硫酸、亚硝酸、氯气、氨气，溴、溴甲烷）的环境。
 - ③ 有臭氧、紫外线及放射线照射的环境。
 - ④ 振动或冲击条件超过商品目录或缴纳规格书规定范围的过激环境。

5) 额定电压

- 电容器设定有额定电压。使用电压请不要超过额定值。

6) 极性

- 电容器是有极性的。使用时请确认其极性。

7) 放电开始时的电压降

- 放电电流大时，在放电开始时会产生电压降。请确认电路的放电电流及电容器的内阻值。

8) 串联连接

- 串联连接时，应考虑到电容器的电压不均衡问题。请确保使用电压不超过额定值，或增加电压平衡电路（例如：使用分压电阻）。

CAUTION FOR PROPER USE OF EDLC

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, sulfuric 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) 施加纹波或脉冲电流

- 对电容器施加大的纹波电流或脉冲电流，会导致其发热并加速其寿命的减少，请在使用时注意。

10) 封装套管的绝缘

- 电容器的外装套管不能保证绝缘性。请勿用于需要绝缘的地方。若需要套管具有绝缘功能时，请咨询我们。

11) 安装环境的设计

- 将电容器安装至印刷电路板时，需事先确认以下内容，再进行设计。
 - ① 请确认电容器的端子间隙与印刷电路板孔间隙一致。
 - ② 设计时不可将配线及电路板延伸到电容器压力阀上方。
 - ③ 请按商品目录或缴纳规格书的规定，在电容器的压力阀部位，空出一定的间隙。
 - ④ 铝电解电容器的压力阀接触到印刷电路板时，请在印刷电路板的正对位置上设置排气孔。

12) 印刷电路板的设计

- 请不要在电容器的封口部下方进行电路配线。
- 不要在电容器周围及印刷电路板的另一侧（电容器的下方）配置发热部件。

13) 其他

- 在双面印刷电路板上安装电容器时，请不要在电容器下面设计多余的印刷电路板孔及正反面连接用贯通孔。
- 螺栓端子的紧固扭矩不可超出缴纳规格书中的规定范围。
- 并联2个以上的电容器时，请考虑到电流的平衡。

9) Applied ripple current or pulse 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 conditions

- 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.

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. 安装注意事项

1) 安装时-1

- 请确认电容器的额定值（静电容量及电压）后，再进行安装。
- 请确认电容器的极性后，再进行安装。
- 请勿将电容器跌落到地上。跌落到地上的电容器，请不要再使用。
- 安装时，请勿使电容器变形。

2) 安装时-2

- 请确认电容器的端子间隙与印刷电路板孔间隙一致后，再进行安装。
- 利用自动插入机对电容器的引线进行弯曲加工，以固定在印刷电路板上时力量不能过大。
- 请注意自动插入机及装配机的吸附器、产品检验器及位置对准操作所引起的冲击力。
- 若担心组装中有振动、冲击等，安装电容器至印刷电路板时，请使用辅助工具、粘合剂等增强其牢固性。

3) 电烙铁焊接

- 焊接条件（温度、时间）不可超过商品目录或缴纳规格书的规定范围。
- 端子间隙与印刷电路板孔穴间隙不一致，而在焊接前进行加工时，不能使电容器主体承受应力。
- 利用电烙铁进行手工修整时，如果需要将焊接好的电容器卸下，请将焊锡充分融化后再取下，以免使电容器的端子承受压力。
- 请勿用电烙铁的前端接触电容器的主体。

4) 波峰焊接

- 进行焊接时，请勿将电容器主体浸入熔融状态的焊锡中。插入印刷电路板作为阻隔，只对放电容器侧反面的电路板表面进行焊接。
- 焊接条件（预热、焊接温度、端子浸渍时间）不可超过商品目录或缴纳规格书规定的范围。
- 端子以外部分，不可附着助焊剂。
- 在焊接时，注意避免其他部件翻倒接触到电容器。

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) 焊接后的处理

- 将电容器焊接在印刷电路板上之后, 请不要将电容器的主体倾倒或扭曲。
- 不可用手抓住电容器的主体搬运电路板。
- 重叠放置印刷电路板时, 不可以让印刷电路板或其他部件碰到电容器。

6) 焊接后的基板清洗

- 进行清洗时请联系我们。

7) 固定剂、涂层剂

- 请不要使用含有含卤溶剂等的固定剂、涂层剂。
- 在使用固定剂和涂层剂之前, 请将基板和电容器的封口部位之间清扫干净, 不可留有助焊剂残渣及污垢。
- 在使用固定剂和涂层剂之前, 请对电容器上附着的清洗剂等进行干燥。
- 在使用固定剂和涂层剂时, 请不要将电容器封口部全部堵塞。

3. 保养检修

- 对于工业中使用的电容器, 请定期进行检修。检修项目包括如下内容。
 - ① 外观: 开阀、液体泄漏等明显异常。
 - ② 电特性: 静电容量、ESR以及商品目录或缴纳规格书中规定的项目。

4. 紧急情况

- 在配套设备使用过程中, 电容器开阀, 并喷出气体时, 请切断设备的主电源或者将电源线的插头从插座中拔出。
- 电容器的压力阀开启时, 将喷出高温气体, 此时不可以将脸部靠近。若喷出的气体进入眼睛或被吸入时, 应立即用水洗净眼部或漱口。不可以舔食电容器的电解液, 如果电解液溅到皮肤, 请用肥皂进行冲洗。

5. 保管条件

- 请不要在高温高湿的环境中保管电容器。请保管在温度 5°C~35°C, 相对湿度在75%以下的室内。
- 不要在能够直接接触到水、盐水以及油的环境中保管电容器。
- 请不要在充满有害气体(硫化氢、亚硫酸、亚硝酸、氯气、氨气、溴、溴甲烷等)的环境中保管电容器。
- 请不要在有臭氧、紫外线及放射线照射的环境中保管电容器。

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. 废弃处理

- 在废弃电容器时，请采用以下任意一种方式。
 - ① 在电容器上开孔或充分粉碎后高温(800℃以上)焚烧。
 - ② 在不进行焚烧处理时，应交给专业的工业废弃物处理工厂，由其代为处理。

6.DISPOSAL

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

※详细内容请参阅JEITA RCR-2370C。

JEITA RCR-2370C

《固定双电层电容器使用注意事项指南》

[社团法人 日本电子机械工业会, 1995年3月制定,
2008年7月改订]

For further details

Please refer to : JEITA RCR-2370B (Safety Application Guide for electric double layer capacitors.) [Technical Report of Japan Electronics and Information technology Industries Association in March 1995, revised edition in March 2006].

◆产品型号体系 / PART NUMBER

□□□ 额定电压 Rated Voltage	□□□ 系列名称 Series	□□□ 静电容量 Capacitance	□ 静电容量允许差 Capacitance Tolerance	□□□ 副记号 Option ※1	□□ 引线加工记号 Lead Forming	D×L 铝壳尺寸 Case Size																											
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在订货时，请注明额定电压、系列名称、静电容量、引线加工、铝壳尺寸的信息。
Please indicate the above information, when ordering.

※1 副记号: 标准品为空白。
Option : Standard item is blank.

◆包装规格 / PACKAGE SPECIFICATION

产品尺寸 SIZE	长引线品 / LONG LEAD			
	散装 BULK PACKAGE		盒装 ALIGNED PACKAGE	
	包装单位	PACKAGE QUANTITY	包装单位	PACKAGE QUANTITY
φ8	1000		—	
φ10	1000		—	
φ12.5	—		500	
φ16、φ18、φ20	—		200	
φ22	—		100	

包装单位存在与上述相异的情况。
There are some differences between actual package quantity and above list.