Ver. 00
August 31, 2017

Cylinder Type Lithium Ion Capacitors

Product Usage Guide
(User Manual)

Lithium ion capacitors are shipped in a charged state. It is dangerous if a short circuit forms between the terminals because they already have stored energy by the time they are shipped. Please read this user manual carefully and handle the development sample with the utmost caution.

Vision for Nature
VINATech

Contents

Precautions for Use

Precautions for Use

1. Safety Symbols Used in This Manual

This manual uses symbols to highlight danger and sources of hazards that may cause personal injury or damage to property. Users of cylinder-type lithium ion capacitors (hereinafter, “lithium ion capacitors”) should pay special attention to these safety symbols.
Please read the sections in which the symbols are displayed and familiarize yourself with them before using the product.

●To ensure safe use of the product, the following warning symbols are used with explanations in this manual.

Danger	This symbol indicates actions that present imminent danger of serious personal injury if the product is handled improperly.
Warning	This symbol indicates actions that present the possibility of serious personal injury if the product is handled improperly.
Caution	This symbol indicates actions that present the possibility of personal injury or property damage if the product is handled improperly.

●The following warning symbols are used to categorize and explain matters to be observed in handling the product.

	This symbol indicates an action that is prohibited.
	This symbol indicates instructions that must be followed without fail.
	This symbol indicates a general caution.

Note on this product usage guide (user manual)

1. No part of this document may be reprinted or copied without permission.
2. The content of this document may be changed in the future without prior notification.
3. Although we make every effort to ensure that the content of this document is accurate, please let us know if you find any errors or omissions.
4. VINATech assumes no responsibility for the results of any actions that go against the instructions given in this user manual.

○ Lithium ion capacitors are suitable for use in a wide range of business fields because of not only their high operating voltage and high energy density, but also their long cycle life and quick charging and discharging capabilities.

2. For Your Safety

- This product has been charged to a certain voltage before shipment, and therefore improper handling or usage may cause an electric shock or personal injury.
- Read this document carefully and familiarize yourself with the handling and usage before using the product.
- Make sure that the purpose of use, place, and environment are appropriate. In the event of abnormal conditions or if you find a problem, stop using the product and contact us immediately.

<Dangers>

- For your safety, please observe the following when using the product.

Danger
Do not throw the product into the fire or heat it to temperatures exceeding the upper limit temperature specified in the specifications. Do not use the product near flames. ●It may start to smoke, explode, or burst into flames.
Do not throw the product into water. ● It may start to smoke, explode, or burst into flames. **Do not disassemble or alter the product or damage it with a sharp object such as a knife or nail.** ●It may cause an electric shock or personal injury. Damage to the main body may cause it to heat up, and it may start to smoke, explode, or burst into flames. **Do not short-circuit or inversely connect the positive and negative electrode terminals.** ● It may start to smoke, explode, or burst into flames.
Do not hit the product with a hammer or a similar object or step on it. ● It may start to heat up, smoke, explode, or burst into flames. **Do not place the product on an electromagnetic cooker or in a microwave oven, a high-pressure vessel, or a vacuum vessel.** ● It may start to leak, smoke, explode, or burst into flames. **Do not store or install the product in places exposed to high temperatures, such as a vehicle cab under the direct sunlight.** ● It may start to smoke, explode, or burst into flames. **Wear personal protective equipment such as insulating gloves** when touching conductive parts such as terminals. ●Failure to wear personal protective equipment may result in an electric shock, burns, or personal injury. Before storing the product, **insulate the positive and negative electrode terminals**. ●Failure to insulate the terminals may result in an electric shock, burns, or personal injury, and the product may start to smoke, explode, or burst into flames.

<Warnings>

- For your safety, please observe the following warnings when using the product.

Warning
Do not use the product at voltages outside the operating range. ●Improper use at voltages outside the operating range not only will shorten the product's life, but may also cause it to leak, heat up, smoke, explode, or burst into flames.
Do not use the product at temperatures outside the operating range. ●Improper use at temperatures outside the operating range not only will shorten the life, but may also cause it to leak, heat up, smoke, explode, or burst into flames.
Keep the voltages balanced when multiple products are used in series or parallel connection. ●It may cause an internal short circuit, leakage, or a fault.
Do not hold the terminals when carrying the product. ●It may cause an electric shock, an internal short circuit, leakage, or a fault.
Do not drop or subject the product to excessive shock or vibration. ●It may cause an internal short circuit, leakage, heat generation, or a fault.
Make sure that the product is not installed near heat generating parts of the equipment. ●It may cause leakage, heat generation, or a fault.
Do not install or store the product in hot and humid places or places exposed to direct sunlight for a long period of time. ●It may cause leakage, heat generation, or a fault.
In general, electronic components all have a definite failure rate. **In view of the fact that the product will fail at some time, design for safety including built-in redundancy, measures to prevent the spread of fire, and fail-safe design to prevent accidents that can result in personal injury, fire, or negative social impact.**
Use a protection circuit such as a voltage equalization circuit to balance voltages between cells. ●Failure to balance voltages between cells may cause leakage or a fault.
Wear personal protective equipment such as insulating gloves when touching conductive parts such as terminals. ●Failure to wear personal protective equipment may result in an electric shock, burns, or personal injury.
Please contact VINATech for advice first if there is a problem with the conditions of use, operating voltage range, or other matters, as well as when the product is used in combination with other batteries. ●VINATech assumes no responsibility for problems resulting from failure to seek prior advice.
In the event of abnormal conditions, such as leaks, emission of a strange smell, smoke, or heat, **stop using the product and contact us or the distributor immediately**. ●Failure to balance voltages may cause leakage or a fault.

	If leaking electrolyte comes into contact with the skin or eyes, **do not rub them. Flush the area thoroughly with running tap water.** If electrolyte gets into the mouth, **rinse your mouth with running tap water. Consult a doctor immediately in both cases.**

<Cautions>

For your safety, please observe the following cautions when using the product.

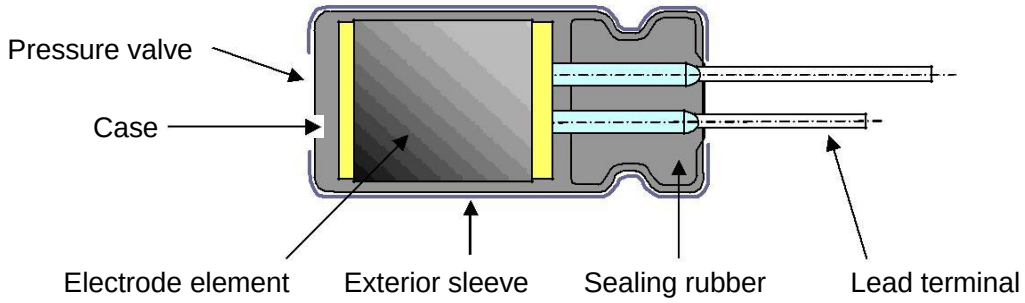
	Caution
	The terminals of the product have a (positive or negative) polarity. **Use them with the correct polarities.** ●Use with the wrong polarities may cause it to leak, heat up, smoke, explode, or burst into flames.
	**Observe the precautions for electrical handling** when connecting a connector or electrical wire to the terminals. ●Failure to do so may cause it to leak, heat up, smoke, explode, or burst into flames.
	**Select** connectors and electrical wires to be connected **with the correct ratings for the electrical currents used.** ●Use of a connector or an electric wire with the wrong rating for the electric current used may cause it to heat up or burst into flames.
	When returning the product, **wrap the terminal in insulating tape to avoid short-circuiting the terminals and then return it using VINATech's original packaging (or similar packaging).** ●Failure to do this may cause it to heat up or burst into flames.
	Please note that if the voltage of the connected equipment is lower than the hold voltage of the product, **an excessive current may flow from the cell to the connected equipment** on turning on the power.
	If the electrolyte leaks out onto your clothing, **wash it out immediately with running tap water.**
	When you receive the product, **check that there are no abnormalities, such as deformation, leaking electrolyte, strange smell, or heat**. If you find anything unusual on receiving the product, **do not use it and contact us or the distributor immediately.**

3. Product Overview

A lithium ion capacitor is a hybrid type of capacitor, in which activated carbon is used as the positive electrode and lithium-occluded carbon is used as the negative electrode. It is a promising new type of storage device that combines the high power density of an electric double layer capacitor and the high energy density of a lithium ion battery. Use the product in accordance with the application and the conditions of use.

4. Appearance and Names of Parts

●Appearance of the product (example)



5. Environmental Conditions and Storage Locations

●Use and store the product under the following environmental conditions specified for individual products.

VINATech's product number	VLCRS3R8206MG, VLCRS3R8406MG VLCRS3R8107MG, VLCRS3R8277MG
① Operating temperature range	-30°C to 70°C (over 70°C to 85°C)
② Operating voltage range	2.2 V to 3.8 V (2.5V to 3.5V)
③ Storage temperature range	5°C to 35°C
④ Long-term storage temperature (Recommended maximum duration is one year.)	10°C to 35°C
⑤ Storage humidity range	80% RH or less (non-condensing)
⑥ Long-term storage humidity (Recommended maximum duration is one year.)	65% RH or less (non-condensing)

Do not store the product for a long period of time at voltages above the upper limit voltage (3.8 V) or below the lower limit voltage (2.2 V).

Do not use or store the product at high temperatures, in direct sunlight, near a space heater or other heat sources, at high humidity, or in locations where there is water condensation, ice and snow, or freezing conditions. In addition, do not store the product in the following environments:

1. Environments exposed to liquids such as solvents or oil
2. Environments filled with gaseous oily constituents
3. Environments exposed to salt water or salt-laden air
4. Environments exposed to acid or alkaline solutions

	5. Environments filled with a caustic gas (e.g., hydrogen sulfide, sulfur dioxide, chlorine, and bromine) 6. Environments that may subject the product to vibrations or impacts
	When storing the product for a long period of time, **pack it in materials strong enough to prevent damage from stacking**, **taking care to preserve the isolation between individual terminals** to prevent a short circuit between them.

6. Precautions in Handling

●Observe the following precautions when using the product.

	**Do not damage the main body with a knife, nail, or other sharp object.** ●It may cause an electric shock, personal injuries, or burns. Damage to the main body cause it to heat up, smoke, explode, or burst into flames.
	**Do not short-circuit the positive and negative electrode terminals.** **●This product is designed to have a certain voltage at the time of shipment. More specifically, energy corresponding to the voltage has been prestored in the product. Therefore, never short-circuit the positive electrode terminal with the negative electrode terminal.** ●It may cause an electric shock, burns, or personal injury, resulting in a fault causing it to leak, heat up, smoke, explode, or burst into flames. ●Especially when using a metal tool, use it taking care not to short-circuit the terminals. (Examples of dangerous operations: cutting two lead terminals at the same time with nippers; measuring the pitch of the lead terminals with metal vernier calipers)
	**Do not discharge the product to voltages less than the lower limit voltage (2.2 V).** ●Discharging the product to voltages less than the lower limit voltage will drastically shorten the life, which may result in a deterioration of the electrical characteristics, a short circuit, an open circuit, or an explosion caused by leaking electrolyte or generation of gas. **●Products whose voltage falls below the lower limit voltage cannot return to the initial normal state even when they are recharged one more time. Please take special care with storage and handling, and design circuits so that the voltage never falls below the lower limit voltage.**
	**Do not charge the product to voltages greater than the upper limit voltage (3.8 V).** ●Charging the product to voltages greater than the upper limit voltage will drastically shorten the life, which may result in a deterioration of the electrical characteristics, a short circuit, or an explosion caused by leaking electrolyte or generation of gas.
	**Do not apply a reverse voltage.** ●It may deteriorate the electrical characteristics, or result in an explosion caused by leaking electrolyte or generation of gas.
	**Do not use products that have been dropped.** ●Use of a dropped product may result in a short circuit or an explosion caused by leaking electrolyte or generation of gas.

	Do not apply excessive heat stress to the main body, positive electrode terminal, or negative electrode terminal. This will deteriorate the electrical characteristics, and result in leakages, a short circuit, or an abnormal appearance because of increased internal pressure from generated gases.
	Do not apply force to the positive and negative electrode terminals as this may bend or break off the terminal, resulting in breach of the airtightness, leaking electrolyte or a short circuit caused by generated gases and resultant increased internal pressure, or abnormal appearance.
	Do not apply excessive external force with a sharp object as this may pierce the product, resulting in breach of the airtightness, leaking electrolyte or a short circuit caused by generated gases and resultant increased internal pressure, or abnormal appearance.

7. Precautions for Devices Using Lithium Ion Capacitors

7.1 Operating voltage range and operating temperature range

●Use the product within the operating voltage range and the operating temperature range

	**Do not use the product at voltages above the upper limit voltage (3.8 V) or below the lower limit voltage (2.2 V), or at temperatures outside the operating temperature range (-25°C to 85°C or 60°C).** ●It may generate gas, causing it to leak, heat up, smoke, explode, or burst into flames.
	**Do not use the product at voltages below the lower limit voltage (2.2 V).** ●It may generate gas, causing it to leak, heat up, smoke, explode, or burst into flames. **Take due care when designing circuits so that the voltage never falls below the lower limit voltage.**
	**Do not use the product at voltages greater than the upper limit voltage (3.8 V).** ●It may generate gas, causing it to leak, heat up, smoke, explode, or burst into flames. **Take due care when designing circuits so that the voltage never exceeds the upper limit voltage.**
	**Install a switch that can interrupt the equalization circuit or an anti-overdischarge function** that prevents, in particular, overdischarge states at a voltage below the lower limit voltage (2.2 V). **It is recommended that an anti-overdischarge function be implemented to deal with human error such as forgetting to turn off switches.**
	**Design the heat dissipation performance with care.** Depending on the use conditions (e.g., ambient temperature, charging/discharging currents, charging/discharging frequency), the temperature inside the cell can exceed the operating temperature range. When there is concern over a rise in temperature, design the heat dissipation performance not to allow the internal temperature to exceed the operating temperature range by ensuring there is sufficient dissipation space, implementing a dissipation board, or other appropriate methods. In addition, concurrent use of a forced cooler such as a cooling fan is recommended.

7.2 Use with the proper polarity

●The terminals of the product have a (positive or negative) polarity.

	**Do not connect the terminals the wrong way round.** ●It may generate gas, causing it to leak, heat up, smoke, explode, or burst into flames.
	To identify the terminals, **the polarities are displayed on the exterior sleeve and the terminal lengths are different.** To avoid connecting the terminals the wrong way round, **check the exterior sleeve and terminal lengths before connecting the terminals.**

7.3 Use in particularly safety-conscious applications

●In general, all electronic components have failure rate. Although VINATech makes every effort to improve the product quality, it is not possible for us to make the failure rate zero. In some cases, generation of gases may occur, caused by leaking electrolyte or an internal short circuit, resulting in expansion or deformation. In particular, expansion caused by gases that are generated when overcharging or overdischarging occurs is very dangerous because it may cause a short circuit between the internal electrodes, electrolyte leakage, or an explosion. It is strongly recommended that the housing structure should be designed to reduce deformation of the cell.

	**Do not incorporate our products into any equipment requiring high levels of safety and/or reliability (e.g., aerospace equipment, aviation equipment*, medical equipment classified as Class IV by IMDRF, nuclear control equipment, undersea equipment, military equipment).** ●It may cause an accident resulting in personal injury or negative social impact.
	Our products are intended for use in general electronic equipment (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment including, without limitation, mobile phone, and PC) and medical equipment classified as Class I or II by IMDRF. **Please be sure to contact VINATech for further information before using the products for any equipment which may directly cause loss of human life or bodily injury (e.g., transportation equipment including, without limitation, automotive powertrain control system, train control system, and ship control system, traffic signal equipment, disaster prevention equipment, medical equipment classified as Class III by IMDRF, highly public information network equipment including, without limitation, telephone exchange, and base station).**
	To minimize the result of a product failure in the application for which it is used, **design for safety including built-in redundancy, measures to prevent the spread of fire, and fail-safe design to prevent accidents that can result in personal injury, fire, or negative social impact.** ●It may cause an accident resulting in personal injury, a fire, or negative social impact.
	When our products are used even for high safety and/or reliability-required devices or circuits of general electronic equipment, it is strongly recommended to perform a thorough safety evaluation prior to use of our products and to install a protection circuit as necessary. **Please contact VINATech or the distributor for advice beforehand** for details of the application the product is used in.

7.4 Use conditions and life

●Lithium ion capacitor products have a limited life.

The life of the product varies depending on the use conditions. **Design the equipment to cope with changes in the characteristics over a long period of time to ensure the safety of the equipment.**

7.5 Ensuring safety

●Lithium ion capacitors are equipped with a pressure valve.

If the pressure inside the main body increases abnormally, this pressure valve ruptures to release the gas inside. **Mount the product allowing a set space (2 mm or more for products with a diameter less than φ18 mm; 3 mm or more for products with a diameter equal to or greater than φ18 mm) above the pressure valve** so that the pressure valve can work effectively. Do not place any wires or patterns above the pressure valve because a jet of hot gas is emitted when the pressure valve is activated. In addition, products with an open pressure valve cannot be used.

7.6 Using with large currents

●Lithium ion capacitors used with large currents will generate heat.

Do not use the product at currents exceeding the maximum charging/discharging current.

The allowable current for controlling the voltage is specified, even when the product is controlled within the predetermined voltage range. Please ensure that the product charges or discharges within the prescribed current range.

●It may generate heat, start to smoke, expand, deform, explode or start to leak electrolyte.

●The following are the maximum charging/discharging currents that VINATech specifies.

VINATECH's product number	Charging	Discharging
VLCRS3R8206MG	2 A	
VLCRS3R8406MG	2 A	
VLCRS3R8107MG	5 A	
VLCRS3R8277MG	5 A	

●**Please contact VINATech for advice before using** product at currents exceeding the maximum charging/discharging current.

VINATech assumes no responsibility for problems resulting from failure to consult us.

Use of the product at the maximum charging/discharging current generates a large amount of heat in a short period of time. **Do not use the product continuously at the maximum charging/discharging current.**

Design the heat dissipation performance and the connection method to avoid allowing the surface temperature of the cell to exceed the operating temperature range.

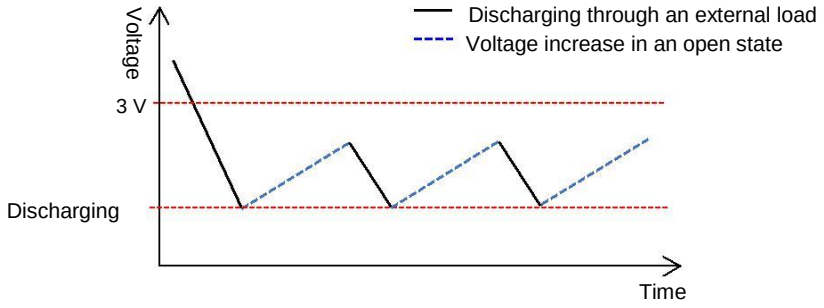
7.7 Using multiple capacitors in combination

●Observe the following precautions when multiple capacitors are used in combination.

	Do not mix this product with other storage devices such as other types of capacitors or different types of lithium ion capacitors.
	When multiple lithium ion capacitors of the same type are used in combination, **equalize the voltages before using them.**
	When multiple capacitors are connected in series, **the balance of the applied voltage may be lost, and some capacitors may be overcharged or overdischarged. Make sure that the voltage of each lithium ion capacitor is within the operating voltage range. Use of a voltage equalization circuit is recommended.**
	When multiple capacitors are connected in parallel, **pay attention to the balance of charge / discharge current of each lithium ion capacitor.**
	The voltage is "equal to or greater than 3.0 V" when the product is shipped. However, when using multiple cells that have not been used for a long time in combination, **equalize the voltages of the cells before using them.**

7.8 Discharging at low voltages

●A lithium ion capacitor has a slowly increasing voltage characteristic when it is open-circuited at a voltage equal to or less than 3 V.

	Repeated discharging following a voltage increase as a result of an open circuit at a voltage equal to or less than 3 V (refer to the following chart) may deteriorate the characteristics of the cell. **Avoid starting to discharge when the voltage of the product is less than 3 V.**
	
	To avoid using the product as described above, **charge it to a voltage equal to or greater than 3 V before starting to discharge.**

7.9 Bending or cutting lead terminals

●Observe the following precaution when bending or cutting lead terminals.

	Do not bend or cut leads without tools for fixing cell. Provide a fixed part between the stress application point at the time of bending and the product body so that stress is not applied to the product body when bending or cutting the lead terminal.
	Do not bend or cut from the base of the lead terminal. Please set a certain distance (as a standard, more than twice the lead wire diameter) from the main body of the product and perform bending of the lead. As stress is applied to the inside of the product, it may cause troubles such as internal short circuit.

8. Maintenance and Checks

●It is recommended that equipment in use should be checked periodically.

Equipment in which lithium ion capacitors are used should be checked periodically for the following items.

(1) Appearance: Presence or absence of any marked abnormalities, such as deformation, expansion, or electrolyte leakage

(2) Electrical characteristics: Items specified in the catalogue or the delivery specification document

●**In the event that you find anything unusual from the above checks, stop using the product and take appropriate measures or replace it.**

9. Transportation

●Keep in mind the following points when transporting the product.

Do not apply excessive vibration or shocks when transporting the product.

Prevent the packaging from being dropped during transportation or being stabbed by lifts, etc. during freight handling.

Package the product in materials strong enough to prevent damage from stacking.

Package the product with individual terminals isolated to prevent short circuits between them.

Do not allow the product to get wet from, for example, rainwater, seawater, ice and snow, dew condensation, or freezing during transportation.

Confirm that the voltage of the cell is not out of the range of the specifications before and after transportation.

[Air transportation regulations]

Currently, lithium ion capacitors are not restricted as dangerous goods in 2015 IATA Regulations. However, as air transportation regulations may be changed, it is recommended that you should check the regulations each time you are transporting lithium ion capacitors and use an appropriate transportation method.

10. In Case of Emergency

●Take the following measures in the event of any abnormalities in use.

If the cell becomes deformed or damaged, **stop using it and replace or collect it immediately.**

If the cell starts leaking electrolyte or gives out a strange smell, **stop using it and move it away from naked flames immediately.**

●The leaked electrolyte may catch fire.

11. Disposal

●Observe the following precaution when disposing of cells.

To insulate a positive lead terminal (+) and a negative lead terminal (-) by covering such as a tape to avoid short circuit and dispose in accordance with local and country rules and regulations.

12. Warranty and Reliability

●Before you export or take VINATech's cell products and/or their technical information outside Japan and provide it to a third party, you must fulfill the conditions of the Foreign Exchange and Foreign Trade Control Law, Export Administration Regulations (EAR) in the U.S. as well as related ordinances, laws, and regulations and follow the procedures prescribed by them.
VINATech assumes no responsibility for problems caused by failure to follow the necessary procedures.

●The technical information described in the delivery specification document is not intended to permit or guarantee the implementation or use of intellectual property or other rights of VINATech or third parties. Consequently, VINATech assumes no responsibility for uses that violate third party rights.

●No part of this document may be reprinted or copied without permission.

●VINATech assumes no responsibility for trouble caused by misuse, improper use, or use deviating from the operating range described in this document.

●VINATech assumes no responsibility for trouble caused by a change in the design (including application and use conditions) specified by your company.

●Although VINATech makes every effort to improve the quality and reliability, all products have a failure rate and will fail at some time. In preparation for the unlikely event of a fault, design the equipment/system safely so that it does not endanger human life directly or cause harm to people or property.

●The VINATech product specifications (example) shown in Section 13 of this document represent typical values. Before using the product, please ask for the delivery specification document specific to VINATech's cell products to confirm specific details.

●The content of this document may be changed in the future without prior notification. You are advised to contact us before starting design for mass production.

13. Product Specifications (Example)

●The following are (example) lithium ion capacitor product specifications (electrical characteristics) by product number.

Product number	Nominal capacitance	Initial specification value	
		Capacitance (Cap.)	Internal resistance (DCR)
VLCRS3R8206MG	20 F	17 to 23 F	250 mΩ or less
VLCRS3R8406MG	40 F	34 to 46 F	125 mΩ or less
VLCRS3R8107MG	100 F	85 to 115 F	60 mΩ or less
VLCRS3R8277MG	270 F	230 to 310 F	60 mΩ or less

Performance and specifications

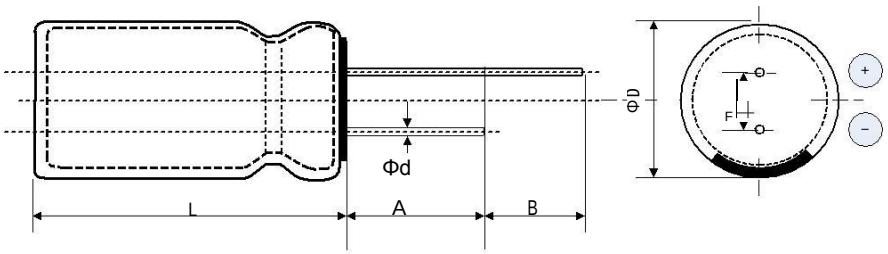
	Item			Specification				Condition
				VLCRS3R8206MG	VLCRS3R8406MG	VLCRS3R8107MG	VLCRS3R8277MG	
1	Operating temperature range (°C)			-30 to +85*				—
2	Maximum operating voltage (V)			3.8				Within the operating temperature range * 3.5 V at temperatures exceeding 70°C
3	Minimum operating voltage (V) (This product has a lower voltage limit.)			2.2				Within the operating temperature range * 2.5 V at temperatures exceeding 70°C
4	Temperature characteristics	-30°C	Cap.	Over 10F	Over 20F	Over 51F	Over 115F	Measured after standing at the temperature on the left for two hours or more. * +85°C: The charging voltage during the measurement of capacitance is 3.5 V.
			DCR	4Ω or less	2Ω or less	1Ω or less	1Ω or less	
		+70°C	Cap.	To satisfy the initial specification value				
			DCR	To satisfy the initial specification value				
		+85°C*	Cap.	To satisfy the initial specification value				
			DCR	To satisfy the initial specification value				
5	High temperature load characteristics -1		Cap.	Over13F	Over 27F	Over 68F	Over 184F	Ambient temperature : 70±2°C Voltage : 3.8V Test period : 1,000 hours
			DCR	375mΩ or less	190mΩ or less	90mΩ or less	90mΩ or less	
6	High temperature load characteristics -2		Cap.	Over 13F	Over 27F	Over 68F	Over 184F	Ambient temperature : 85±2°C Voltage : 3.5 V Test period : 1,000 hours
			DCR	375mΩ or less	190mΩ or less	90mΩ or less	90mΩ or less	

Note: Unless otherwise specified, all the tests are conducted at room temperature (25±5°C) and room humidity (60±20%RH) set as default.

⚠	The product specifications (example) represent typical values. **Before using the product, please ask VINATech for the delivery specification document specific to the product to confirm specific details.**
⚠	**Please ask VINATech** for details of the test conditions in the product specifications.
⚠	The product specifications may be changed without prior notification. **Contact us before using the product.**

14. Rough External Dimensions (Reference Values)

●The outline drawing and rough dimensions (reference values) by product number of our lithium ion capacitor products are as follows.



Product number	Product dimensions (mm)					
	φD	L	A	B	F	φd
VLCRS3R8206MG	Φ10.0±0.5	30±2	15 min.	3 min.	5.0±0.5	φ0.6±0.05
VLCRS3R8406MG	Φ12.5±0.5	35±2	15 min.	3 min.	5.0±0.5	φ0.8±0.05
VLCRS3R8107MG	Φ18.0±0.5	40±2	15 min.	3 min.	7.5±0.5	Φ0.8±0.05
VLCRS3R8277MG	φ25.0±0.5	40±2	15 min.	3 min.	12.5±0.5	φ1.0±0.05

*These products are equipped with a pressure valve. Mount the product with a set space (2 mm or more for products with a diameter less than φ18 mm; 3 mm or more for products with a diameter equal to or greater than φ18 mm) above the pressure valve so that the pressure valve can work effectively.

⚠	The rough external dimensions represent reference values. **Before using the product, please ask VINATech for the delivery specification document specific to the product to confirm specific details.**
⚠	The rough external dimensions may be changed without prior notification. **Contact us before using the product.**

[Reference]

Laws and Regulations and Guidelines for Lithium Ion Capacitors

The following are the related laws and regulations as of 2017.

Consult the latest laws and regulations before using the product.

No.	Laws and regulations	Storage	Transportation	Disposal	Safety
1	Fire Service Law	√	√	–	–
2	IATA Dangerous Goods Regulations	–	√	–	–
3	Regulations for the Carriage and Storage of Dangerous Goods By Ships	√	√	–	–
4	Ship Safety Act	–	√	–	–
5	Civil Aeronautics Act	–	√	–	–
6	Waste Management and Public Cleansing Act	–	–	√	–
7	Safety Application Guide	–	–	–	√

1. Fire Service Law (September 11, 2015, Act No. 66) / fire prevention ordinances (established by individual municipalities)

These are regulations for the storage and domestic transportation of electrolyte solutions used in lithium ion capacitors. The Fire Service Law stipulates the specified numbers and fire prevention ordinances stipulate the standard transaction volumes. Lithium ion capacitors (cells/modules) use Class III and IV petroleum, water-soluble liquid, danger rating III (specified volume in the Fire Service Law: 4,000 liters) as their electrolyte solutions. Contact our sales representatives for the amount of electrolyte used in each product.

The law also stipulates that storage or handling of this dangerous material must be conducted in a permitted facility in accordance with the technical standards stipulated in the government ordinance. Refer to the Fire Service Law and fire prevention ordinances established by individual municipalities for details.

2. IATA Dangerous Goods Regulations (58th edition, January 2017)

Currently, lithium ion capacitors are not restricted as dangerous goods in 2015 IATA Regulations. However, as air transportation regulations may be changed, it is recommended that you check the regulations each time you are transporting lithium ion capacitors and use appropriate transportation methods.

3. Regulations for the Carriage and Storage of Dangerous Goods by Ships (December 28, 2016, the Ministry of Land, Infrastructure and Transport ordinance No. 88)

Transportation and storage of dangerous goods by vessels must be pursuant to the Regulations for the Carriage and Storage of Dangerous Goods by Ships.

4. Ship Safety Act (June 13, 2014, Act No. 77)

The electrolyte solution used is classified as a flammable liquid. Observe the regulations in the Ship Safety Act.

5. Civil Aeronautics Act (October 28, 2016, Act No. 77)

The aviation regulations during transportation must be pursuant to the regulations in the Civil Aeronautics Act.

6. Waste Management and Public Cleansing Act (abbreviated name: Waste Management Law, July 17, 2015 No. 58)

To insulate a positive lead terminal (+) and a negative lead terminal (-) by covering such as a tape to avoid short circuit and dispose in accordance with local and country rules and regulations.

7. JEITA RCR-2377 Safety Application Guide for Lithium Ion Capacitors (Established in November 2013)