

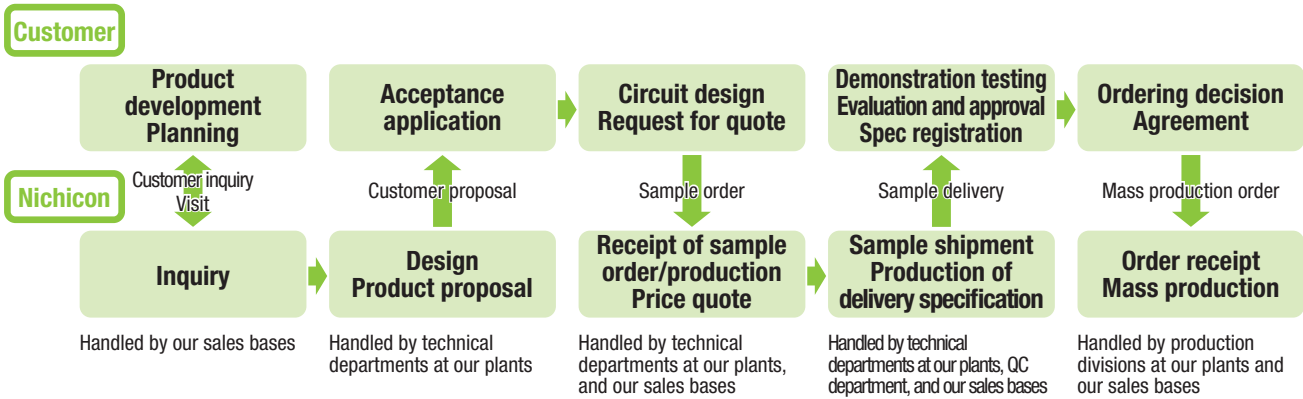
Production By Country

	Snap-in terminal type aluminum electrolytic capacitors	Screw terminal type aluminum electrolytic capacitors	Miniature aluminum electrolytic capacitors	Chip-type aluminum electrolytic capacitors	Electrical double layer capacitors	Conductive polymer aluminum solid electrolytic capacitors	Film capacitors
Japan	●	●	●	●	●	●	●
China	●	●	●	●		●	
Malaysia	●		●	●			

Note: Please confirm when ordering because some series, sizes and specs are not being produced.

Standard Process for Custom Product Development

We offer products optimized to meet our customers' application, size and other design needs.



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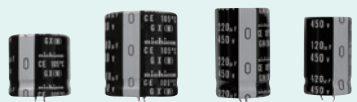
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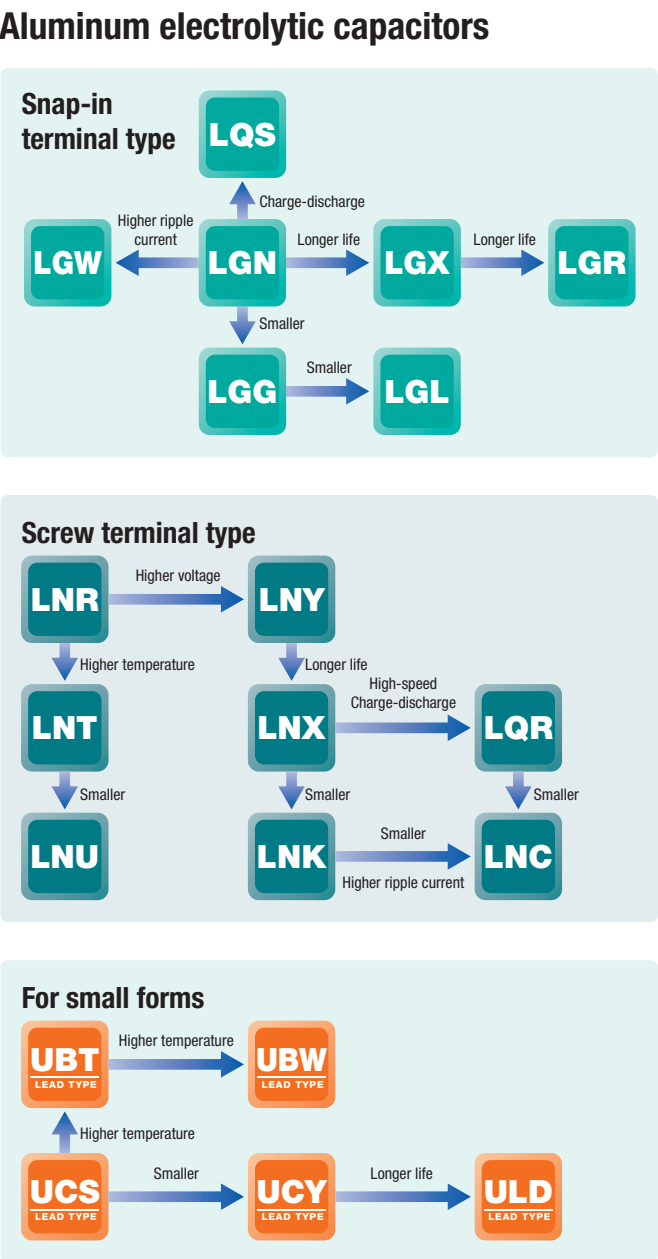
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Series Recommended for Use with Power Electronics

	Aluminum electrolytic capacitors		Film capacitors	Electric double layer capacitors				
	Snap-in terminal type	Screw terminal type						
Power industry segment Useage examples:transformers for power generation, smart grids, etc. Underlying technology Long life High voltage High capacity	LGX 	LGN 	LNC 	LNU 	EU 	ER 	JJD 	JJL 
Plant business segment Useage examples:servo systems, press processing equipment, etc. Underlying technology High voltage High ripple current High-speed charge/discharge	LGW 	LQS 	LNC 	LQR 	EB 	EF 	JJD 	JJL 
Logistics and transport segment Useage examples:electric rail equipment, high-speed chargers, etc. Underlying technology Long life High capacity High-speed charge/discharge	LGX 	LGW 	LNC 	LNU 	EU 	ER 	JJD 	JJL 
Infrastructure business segment Useagw examples:UPS, telecommunications base stations, etc. Underlying technology Long life High capacity High-speed charge/discharge	LGL 	LGR 	LNC 	LNK 	EF 	EM 	JJD 	JJL 

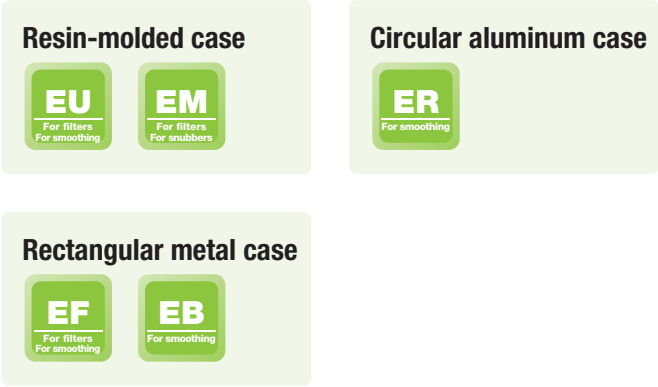
Power electronics-use capacitor series system diagram



We supply optimal capacitors.

Product varieties	Dry film capacitors	Comparison	Aluminum electrolytic capacitors
Performance categories			
High voltage	High (Response corresponding to use)	>	- 630V (NX Series)
Maximum allowable working temperature	105°C	—	105°C
Capacitance range	to low capacity	<	to high capacity
Capacity unit price	High	<	Inexpensive
Capacity tolerance	±3% to ±10%	>	±10% to ±20%
Loss temperature/frequency response characteristics	Low rate of variability	>	High rate of variability
Ripple current durability	Large	>	Small
Electrolytic fluid	Unused	—	Use
Shape	High degree of flexibility	—	Basic shape is circular
Polarity	None	—	Available

Film capacitors



Electric double layer capacitors



Aluminum electrolytic capacitors

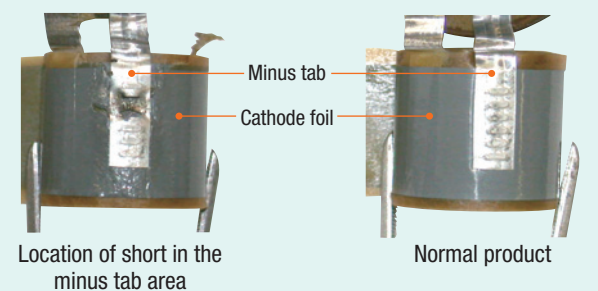
Supporting charging and discharging

We offer highly safe products constructed with cathode foil covering the tab (Nichicon patented technologies).

Problems caused by the addition of high-speed charging and discharging

Voltage fluctuation (ΔV) is great in equipment such as servo amplifiers, and the addition of a short-cycle (high-speed) charging and discharging load can lead to shorting in a short period of time.

Example of failure mode when there is a charging and discharging load



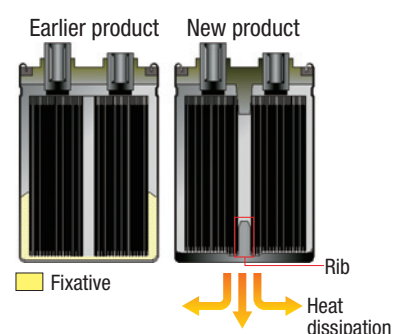
Measures for high-speed charging and discharging

Development of "protective foil construction" by which the tab is covered with cathode foil and a piece of foil of the same type.

This technology is currently established to support high-speed charging and discharging, and is used in the QS Series snap-in terminal type and QR Series screw terminal type capacitors.

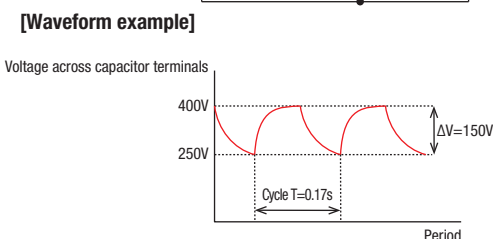
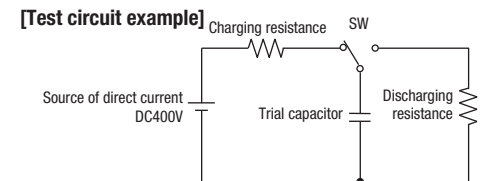
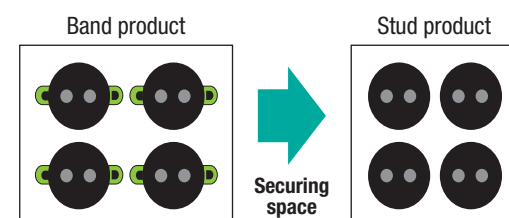
Heat dissipating structure – compoundless structure

A fixed rib structure is used in place of resin for element fixing, improving the capacitor's ability to dissipate ripple current load heat.



Saving space

Space for product placement can be secured and attachment work improved by eliminating the need for an attachment band.



[Verification results]

	Countermeasure method	Charging/discharging recovery when short occurs	Location of short
①	Standard configuration product	Five million periods	Cathode tab area
②	Protective film construction	*50 million periods with no occurrence	—

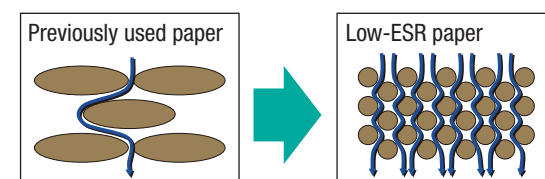
In charging/discharging tests in which $\Delta V=150V$, products made according "protective film construction" specifications presented no problems with their special characteristics even after 50 million periods.

Reduced ESR – Separator improvement

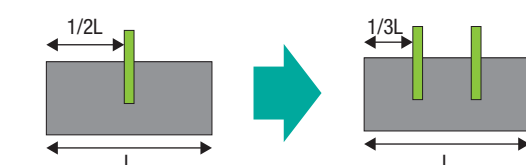
Use of reduced-ESR electrolysis paper reduces the heat generated by the capacitor. In addition, reducing thermal resistance broadly improves heat dissipation efficiency.

In the past, craft paper-type electrolysis paper, which has comparatively thick fibers, was generally used, and by using smaller-fiber reduced ESR electrolysis paper we can reduce the heat generated (temperature rise ΔT) by the capacitor. Also, by increasing the number of aluminum tabs we reduce metal resistance so as to reduce ESR.

[Images showing a cross section of electrolysis paper and electrolytic fluid ionogen transference]



[Reducing metal resistance by increasing the number of tabs]



Film capacitors

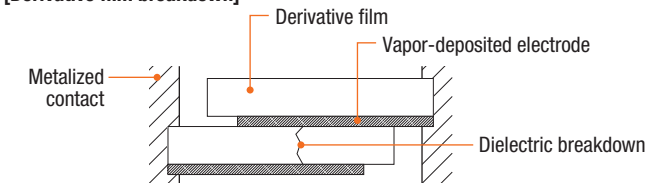
Safety functions

We offer high-voltage, high-capacitance products with improved safety via our exclusive vapor deposition pattern.

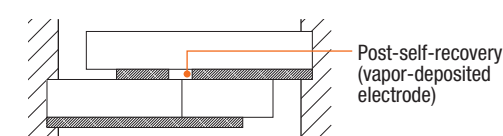
Self-recoverability

Because the vapor-deposited electrode in a self-healing (SH) film capacitor is a thin metal membrane, in the event of a dielectric breakdown that portion of the electrode is instantly vaporized, and capacitor function is recovered.

[Derivative film breakdown]



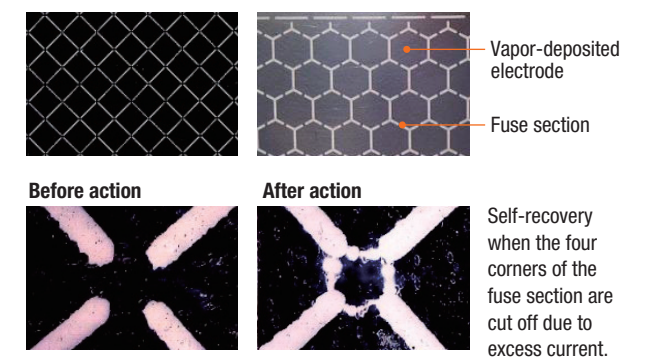
[Post-self-recovery SH film capacitor]



Safety

This capacitor is characterized by the lack of affect on the capacitor's electrical function when a dielectric breakdown occurs as a result of exceeding the self-healing (SH) film capacitor's self-recovery limit. This is because the excess current that occurs at the time of the breakdown cuts away the subsection of the capacitor that has failed.

[Example of protective mechanism-type]



Saving space

Able to support a variety of forms.

We support customization that keeps space to the customer's desired specifications.

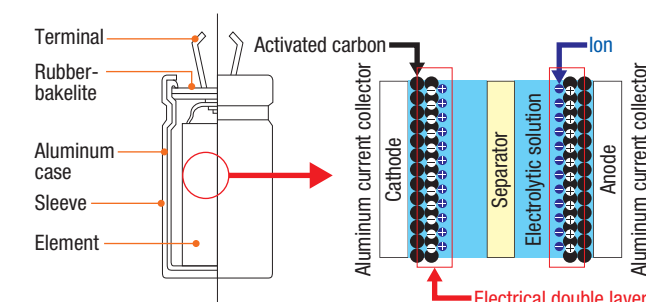


Electric double-layer capacitors

Long life

We offer low-deterioration products with long lifespans.

This device uses electrical double layers between a solid and liquid interface. The charge and discharge are created through physical adsorption/dispersion of ions. Consequently, there is little deterioration of the electrode or electrolytic fluid, providing much longer life than batteries that use chemical reactions.



Variety of storage uses

Offering a variety of applications in place of existing batteries.

1. Standby power source

Enables thorough power savings and improves environmental performance when used as a power storage device for standby power for remote controls for televisions, air conditioners, and game consoles.

2. Backup power source

Offers lighter weight and longer life than existing lead batteries when used as a stable, short-term power source in a variety of applications.

3. Emergency-use local power supply for essential utilities

Unlike batteries, which must be changed in the short term, these can provide long-term maintenance-free power sources for essential utilities.

4. Stand-alone power source

When used in conjunction with small photovoltaic cells or similar they can function as a power source for street lamps, traffic signals, etc.



Summary of Series According to Use

Charge/discharge control circuit

LGW

Snap-in terminal type 105°C products supporting high ripple current



- Products supporting high ripple current
- Products with rated ripple current application guaranteed for 3,000 hours

Product size	ø22×25L to ø35×50L
Endurance	3,000 hours at 105°C
Rated voltage	200 to 450V
Capacitance range	82 to 2,200µF

LGX

Snap-in terminal type 105°C Long-life, miniature product



- 500V rating added
- Long-life products with rated ripple current application guaranteed for 5,000 hours

Product size	ø22×25L to ø35×50L
Endurance	5,000 hours at 105°C
Rated voltage	200 to 500V
Capacitance range	56 to 2,200µF

LGR

Snap-in terminal type 105°C long-life products



- Optimal for use in power source circuitry requiring a high degree of reliability
- Products with rated ripple current application guaranteed for 10,000 hours

Product size	ø22×25L to ø35×50L
Endurance	10,000 hours at 105°C
Rated voltage	200 to 450V
Capacitance range	39 to 1,500µF

LQS

Snap-in terminal type 105°C Product supporting high-speed charging and discharging



- Supports voltage fluctuations in regions in which the commercial power source situation is poor
- Products with rated ripple current application guaranteed for 3,000 hours

Product size	ø22×25L to ø35×50L
Endurance	3,000 hours at 105°C
Rated voltage	350 to 450V
Capacitance range	82 to 820µF

LNC

Miniature screw terminal type 85°C supporting high ripple current



- Standard support for high-speed charging and discharging load
- Products with rated ripple current application guaranteed for 5,000 hours

Product size	ø51×55L to ø90×215L
Endurance	5,000 hours at 85°C
Rated voltage	350 to 500V
Capacitance range	1,000 to 22,000µF

LNU

Miniature screw terminal type 105°C Miniature high-voltage product



- Standard support for high-speed charging and discharging load
- Products with rated ripple current application guaranteed for 5,000 hours

Product size	ø51×75L to ø90×235L
Endurance	5,000 hours at 105°C
Rated voltage	400 to 525V
Capacitance range	680 to 18,000µF

EF

Self-healing type with protective mechanism attached



- Contributes to making devices smaller and rationalization
- Superior high frequency properties

Category temperature range	-25 to +60°C
Rated voltage	1,000 to 3,300VDC
Capacitance range	1,000 to 6,000µF

EU

Self-healing type with protective mechanism attached



- Oil-less capacitor
- Maintenance-free

Category temperature range	-25 to +70°C
Rated voltage	750 to 3,300VDC
Capacitance range	150 to 3,100µF

EM

Self-healing type with protective mechanism attached



- Maintenance-free, long-life product
- Low-impedance product supporting high ripple appropriate to high-frequency use

Category temperature range	-25 to +70°C
Rated voltage	250 to 1,200VDC (220 to 250VAC)
Capacitance range	0.5 to 50µF

ER

Self-healing type with protective mechanism attached



- Capacitor supporting an oil-less environment
- Resin-mold type with protective mechanism attached

Category temperature range	-40 to +85°C
Rated voltage	750 to 1,500VDC
Capacitance range	180 to 700µF

Power storage/load smoothing use

JJD

Screw terminal high energy density-type



- High energy density-type for long-term backup applications
- Optimal for power storage

Product size	ø40×105L to ø76.2×165L
Endurance	2,000 hours at 60°C
Rated voltage	2.5V
Capacitance range	1,000 to 6,000F

JJL

Screw terminal high power density-type



- High power density for instant energy output
- Can be used for high-speed charging/discharging

Product size	ø40×105L to ø63.5×150L
Endurance	2,000 hours at 60°C
Rated voltage	2.5V
Capacitance range	700 to 2,600F

Control and signal circuit use

UBT

Highly reliable product (125 °C product)



- Highly stable product for high temperatures, guaranteed at 125 °C
- For locations with harsh use conditions

Product size	ø8×11.5L to ø18×35.5L
Endurance	2,000 to 10,000 hours at 125°C (50V or less, ø8:2,000 hours, ø10 : 5,000 hours, ø12.5 or more:10,000 hours, 63 to 100V, ø8:2,000 hours, ø10:3,000 hours, ø12.5 or more:5,000 hours, 160V or more:2,000 hours)
Rated voltage	10 to 450V
Capacitance range	1 to 4,700F

UBW

Highly reliable product (135 °C product)



- Highly stable product for high temperatures, guaranteed at 135 °C
- For locations with harsh use conditions

Product size	ø8×11.5L to ø16×31.5L
Endurance	1,000 to 3,000 hours at 135°C (ø8:1,000 hours, ø10:2,000 hours, ø12.5 or more :3,000 hours)
Rated voltage	10 to 100V
Capacitance range	1 to 4,700µF

UCS

Miniature high ripple current long-life product



- Supports high ripple current
- Products with rated ripple current application guaranteed for 10,000 hours (Some, 8,000 hours)

Product size	ø10×16L to ø18×35.5L
Endurance	10,000 hours at 105°C (ø10×16L to ø10×20L:8,000 hours)
Rated voltage	160 to 450V
Capacitance range	6.8 to 330µF

UCY

Miniature high ripple current long-life product



- Supports high ripple current
- Products with rated ripple current application guaranteed for 12,000 hours (Some, 10,000 hours)

Product size	ø10×16L to ø18×46L
Endurance	12,000 hours at 105°C (20L or less or rated at 500V:10,000 hours)
Rated voltage	160 to 500V
Capacitance range	6.8 to 680µF

ULD

Miniature long-life product



- Products with rated ripple current application guaranteed for 20,000 hours (Some, 10,000, 12,000, 15,000 hours)

Product size	ø5×11L to ø18×31.5L
Endurance	20,000 hours at 105°C (ø6.3×11L, ø8×9L, ø10×9L:12,000 hours, ø8×11.5L, ø10×12.5L:15,000 hours), (10 to 100V:10,000 hours)
Rated voltage	10 to 450V
Capacitance range	1 to 330µF

UUL

Chip-type long-life product



- Surface-mount long-life product
- Applicable to automatic mounting machine fed with carrier tape

Product size	ø4×5.8L to ø10×10L
Endurance	5,000 hours at 105°C
Rated voltage	6.3 to 50V
Capacitance range	0.1 to 1,000µF

UCB

Chip-type long-life product



- Surface-mount long-life product
- Applicable to automatic mounting machine fed with carrier tape

Product size	ø4×7L to ø10×10L
Endurance	7,000 hours at 105°C
Rated voltage	6.3 to 50V
Capacitance range	0.1 to 1,000µF

UCW

Chip-type long-life low impedance product



- Surface-mount chip-type long-life low impedance product
- Applicable to automatic mounting machine fed with carrier tape

Product size	ø5×7L to ø10×10L
Endurance	7,000 hours at 105°C
Rated voltage	6.3 to 50V
Capacitance range	10 to 470µF

UCD

Chip-type low impedance product



- Surface-mount low impedance product
- Applicable to automatic mounting machine fed with carrier tape

Product size	ø4×5.8L to ø18×16.5L
Endurance	5,000 hours at 105°C (50V or less, less than 10L:2,000 hours, 63V or more, 10L or less:2,000 hours)
Rated voltage	6.3 to 100V
Capacitance range	1 to 3,300µF

UUB

Chip-type 125 °C highly reliable product



- Surface-mount chip product rated to 125 °C
- Applicable to automatic mounting machine fed with carrier tape

Product size	ø8×6.2L to ø10×10L
Endurance	2,000 hours at 125°C (ø8×6.2L:1,000 hours)
Rated voltage	10 to 400V
Capacitance range	1 to 330µF

PCV

Conductive polymer aluminum solid electrolytic capacitors



- Highly-voltage (to 125 °C)/Low ESR/High permissible ripple current product
- Surface-mount type: 260 °C peak
- Supports lead-free soldering reflow conditions

Product size	ø6.3×6L to ø10×12.7L
Endurance	3,000 hours at 105°C
Rated voltage	16 to 125V
Capacitance range	5.6 to 680µF

PCX

Chip-type long-life low-impedance product



- Highly reliable/Low ESR/High permissible ripple current product
- Surface-mount type: 260 °C peak
- Supports lead-free soldering reflow conditions

Product size	ø6.3×6L to ø10×12.7L
Endurance	3,000 hours (ø6.3:1,500 hours) at 125°C
Rated voltage	16 to 50V
Capacitance range	5.6 to 390µF