NIPPON CHEMI-CON

SCREW MOUNT TERMINAL TYPE ALUMINUM ELECTROLYTIC CAPACITORS

CAT. No. E1001G

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CAPACITOR SERIES TABLE, CONTENTS

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Series			Features	Endurance (+R=With ripple)	Standard type	Low impedance	Solvent-proof	Terminal type	Rated voltage range (Vdc)	Capacitance range (μF)
Conductive Polymer Electrolyte Type		PXF (NEW!)	Vertical type, super low ESR	105℃ 2,000 hours		●	●	SMD	2.5 to 6.3	220 to 1,000
		PXE (Upgrade!)	Vertical type, super low ESR	105℃ 2,000 hours		●	●	SMD	2.5 to 16	33 to 2,700
		PXA (Upgrade!)	Vertical type, super low ESR	105℃ 1,000 to 2,000 hours	●	●	●	SMD	2.5 to 25	3.3 to 1,500
		PXH	125℃ Vertical type	125℃ 1,000 hours		●	●	SMD	2.5 to 20	22 to 1,000
		PSC (Upgrade!)	Radial lead type, super low ESR, high ripple current	105℃ 2,000 hours		●	●	Radial	2.5 to 16	270 to 2,700
		PSA	Super low ESR, high ripple current	105℃ 2,000 hours		●	●	Radial	2.5 to 16	47 to 1,000
		PS (Upgrade!)	Radial lead type, super low ESR	105℃ 2,000 hours	●	●	●	Radial	2.5 to 35	18 to 1,500
Surface Mount	Vertical Type	MVS	4.5mm height	85℃ 2,000 hours	●		●	SMD	4 to 50	0.1 to 220
		MVA	5.5 to 22.0mm max. height, downsized	85℃ 2,000 hours			▲	SMD	4 to 450	0.1 to 10,000
		MV	5.5 to 10.5mm max. height	85℃ 1,000 to 2,000 hours	●		●	SMD	4 to 63	0.1 to 1,000
		MVE	5.5 to 22.0mm max. height, downsized	105℃ 1,000 to 2,000 hours			▲	SMD	6.3 to 450	0.47 to 6,800
		MVK	5.5 to 10.5mm max. height	105℃ 1,000 to 2,000 hours	●		●	SMD	6.3 to 50	0.1 to 1,000
		MKA	5.5 to 10.5mm max. height	105℃ 1,000 to 2,000 hours			●	SMD	6.3 to 50	0.1 to 1,000
		MZA	6.1 to 10.5mm max. height, very low impedance	105℃ 2,000 hours		●	●	SMD	6.3 to 80	3.3 to 1,500
		MVY	5.5 to 22.0mm max. height	105℃ 1,000 to 5,000 hours		●	▲	SMD	6.3 to 100	1.0 to 8,200
		MZD (NEW!)	105℃5,000 hours, low impedance, long life	105℃ 5,000 hours		●	●	SMD	6.3 to 50	10 to 470
		MLA	Low impedance, long life	105℃ 3,000 hours		●	●	SMD	6.3 to 50	10 to 1,000
		MVJ	6.0mm max. height	105℃ 2,000 hours			●	SMD	6.3 to 50	0.1 to 100
		MLD (NEW!)	105℃5,000 hours, long life	105℃ 5,000 hours			●	SMD	6.3 to 50	0.1 to 1,000
		MVL	6.0 to 10.5mm max. height	105℃ 3,000 to 5,000 hours			●	SMD	6.3 to 50	0.1 to 1,000
		MVH	6.0 to 22.0mm max. height	125℃ 1,000 to 5,000 hours			▲	SMD	10 to 450	3.3 to 4,700
		MHB (NEW!)	10.5mm max. height (Ask Engineering No767 in detail)	125℃ 2,000 hours			●	SMD	10 to 35	47 to 470
		MKB (NEW!)	10.5mm max. height	105℃ 3,000 hours			●	SMD	400	2.2 to 4.7
		MV-BP	5.5mm max. height, bi-polar	85℃ 2,000 hours			●	SMD	4 to 50	0.1 to 47
		MVK-BP	6.0mm max. height, bi-polar	105℃ 1,000 hours			●	SMD	6.3 to 50	0.1 to 47
Miniature	Low Profile	SRM	5mm height, downsized	85℃ 1,000 hours			●	Radial	4 to 50	0.1 to 330
		SRE	5mm height	85℃ 1,000 hours	●			Radial	4 to 50	0.1 to 100
		KRE	5mm height	105℃ 1,000 hours	●		●	Radial	6.3 to 50	0.1 to 100
		SRA	7mm height	85℃ 1,000 hours	●			Radial	4 to 63	0.1 to 470
		KMA	7mm height	105℃ 1,000 hours	●		●	Radial	4 to 63	0.1 to 220
		SRG	φ4×7 to φ18×25mm, low profile	85℃ 1,000 to 2,000 hours			●	Radial	4 to 50	0.1 to 10,000
		KRG	φ4×7 to φ18×25mm, low profile	105℃ 1,000 hours			●	Radial	6.3 to 50	0.1 to 10,000
	General Purpose	SMQ	Downsized	85℃ 2,000 hours	●			Radial	6.3 to 450	0.1 to 47,000
		KMQ	Downsized	105℃ 1,000 to 2,000 hours +R	●		▲	Radial	6.3 to 450	0.1 to 47,000
		SMG	General, downsized	85℃ 2,000 hours	●		▲	Radial	6.3 to 450	0.1 to 39,000
		KMG	General, downsized	105℃ 1,000 to 2,000 hours +R	●		▲	Radial	6.3 to 450	0.1 to 22,000
		SME	General (Ask Engineering Bulletin No511 in detail)	85℃ 2,000 hours			▲	Radial	6.3 to 450	0.1 to 15,000
		KME	General (Ask Engineering Bulletin No512 in detail)	105℃ 1,000 hours +R			▲	Radial	6.3 to 400	0.1 to 15,000
		SME-BP	Bi-polar, general	85℃ 2,000 hours	●		●	Radial	6.3 to 100	0.47 to 6,800
		KME-BP	Bi-polar, general	105℃ 1,000 hours	●		●	Radial	6.3 to 100	0.47 to 6,800
	High Frequency Use	KZM	Lowest impedance, long life	105℃ 6,000 to 10,000 hours +R		●		Radial	6.3 to 50	27 to 10,000
		KZH	Lowest impedance, long life	105℃ 5,000 to 6,000 hours +R		●		Radial	6.3 to 35	47 to 8,200
		KZE	Lowest impedance, long life	105℃ 1,000 to 5,000 hours +R		●		Radial	6.3 to 100	6.8 to 6,800
		KY	Low impedance, long life	105℃ 4,000 to 10,000 hours +R		●		Radial	6.3 to 100	0.47 to 18,000
		LXZ	Low impedance, downsized	105℃ 2,000 to 8,000 hours +R		●	●	Radial	6.3 to 63	12 to 18,000
		LXY	Low impedance, high reliability	105℃ 2,000 to 8,000 hours +R	●	●	●	Radial	10 to 63	10 to 8,200
		LXV	Low impedance	105℃ 2,000 to 5,000 hours +R		●	●	Radial	6.3 to 100	5.6 to 15,000
		KMF	Low impedance, high CV, general (Ask Engineering Bulletin No630 in detail)	105℃ 2,000 hours +R		●		Radial	160 to 450	2.2 to 220

: Promotional products

▲ : Some of range are solvent-proof.

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Series			Features	Endurance (+R=With ripple)	Standard type	Low impedance	Solvent-proof	Terminal type	Rated voltage range (Vdc)	Capacitance range (μF)
Miniature	High Reliability	KXJ (Upgrade!)	Downsized, long life, for input filtering	105℃ 10,000 to 12,000 hours +R		●		Radial	160 to 450	6.8 to 680
		KXG	Downsized, long life, for input filtering	105℃ 8,000 to 10,000 hours +R		●		Radial	160 to 450	6.8 to 330
		KMX	Long life, for input filtering (Ask Engineering Bulletin No 646 in detail)	105℃ 8,000 to 10,000 hours +R		●		Radial	160 to 450	3.3 to 680
		SMH	ϕ20×20 to ϕ22×50mm	85℃ 2,000 hours +R	●			Radial	160 to 450	33 to 470
		KMH	ϕ20×20 to ϕ22×50mm	105℃ 2,000 hours +R	●			Radial	160 to 450	33 to 470
		PAG	Low profile, for input filtering	105℃ 2,000 hours +R				Radial	200 to 450	18 to 560
		KLJ	Downsized, no sparks with DC overvoltage	105℃ 2,000 hours +R				Radial	200 & 400	4.7 to 330
		KLG	No sparks with DC overvoltage	105℃ 2,000 hours +R				Radial	200 & 400	22 to 330
		FL	Long life	105℃ 3,000 hours +R			●	Radial	6.3 to 50	0.47 to 270
		GPA	125℃, downsized, low impedance	125℃ 3,000 to 5,000 hours +R		●	●	Radial	25 to 50	470 to 6,800
		GXE	125℃, downsize, low impedance	125℃ 2,000 to 5,000 hours +R		●	▲	Radial	10 to 450	4.7 to 4,700
		GXL	125℃ Long life	125℃ 5,000/10,000 hours +R			●	Radial	10 to 50	100 to 4,700
		GHA (NEW!)	150℃	150℃ 1,000 hours			●	Radial	10 to 35	68 to 3,300
	Special Application	LBG	For airbag	105℃ 5,000 hours +R		●	●	Radial	25 & 35	1,000 to 11,000
		KZV (NEW!)	For PC motherboard (Ask Engineering Bulletin No756 in detail)	105℃ 2,000 hours +R		●		Radial	4	820 to 2.700
		KZJ	For PC motherboard	105℃ 2,000 hours +R		●		Radial	6.3 to 16	470 to 3,300
		KZG	For PC motherboard	105℃ 2,000 hours +R		●		Radial	6.3 to 16	470 to 3,300
		LLA	Low DC leakage, general	85℃ 1,000 hours			●	Radial	6.3 to 50	0.1 to 15,000
		PH	For photo flash	55℃ 5,000 times charging				Radial	300 & 330	–
Large Sized	General Purpose	KMR	105℃, Snap-in terminal, super downsized	105℃ 2,000 hours +R	●			Pin	160 to 450	100 to 3,900
		SMQ	Snap-in terminal, more downsized	85℃ 2,000 hours +R	●			Pin	160 to 450	82 to 3,900
		KMQ	Snap-in terminal, more downsized	105℃ 2,000 hours +R	●			Pin	35, 50, 160 to 450	68 to 33,000
		SMM	Snap-in terminal, downsized	85℃ 3,000 hours +R	●			Pin	160 to 450	47 to 3,300
		KMS (NEW!)	Snap-in terminal, downsized	105℃ 3,000 hours +R	●			Pin	160 to 450	82 to 3,300
		KMM	Snap-in terminal, downsized	105℃ 2,000 to 3,000 hours +R	●			Pin	160 to 450	39 to 3,300
		SMH	Snap-in terminal, general (Refer Engineering Bulletin No585 for 160 to 450V)	85℃ 2,000 hours +R	●			Pin	6.3 to 100	820 to 100,000
		KMH	Snap-in terminal, general (Refer Engineering Bulletin No584 for 160 to 450V)	105℃ 2,000 hours +R	●			Pin	6.3 to 100	560 to 82,000
	Low Profile	SLM	15mm height	85℃ 2,000 hours +R				Pin	160 to 400	47 to 560
		KLM	15mm height	105℃ 2,000 hours +R				Pin	160 to 400	39 to 390
	High Reliability	LXM	Long life	105℃ 7,000 hours +R				Pin	160 to 450	47 to 2,200
		LXS (NEW!)	Snap-in terminal downsized	105℃ 5,000 hours +R	●			Pin	160 to 450	82 to 3,300
		LXQ	Long life, downsized	105℃ 5,000 hours +R				Pin	160 to 450	82 to 2,700
		LXG	Long life	105℃ 5,000 hours +R				Pin	10 to 100	390 to 47,000
		CHA (Upgrade!)	No sparks with DC overvoltage, downsized	105℃ 2,000 hours +R				Pin	200 to 450	56 to 1,200
		LXH	No sparks with DC overvoltage	105℃ 3,000/5,000 hours +R				Pin	200 & 400	68 to 1,500
		RWE-LR	For air-conditioning (Ask Engineering Bulletin No768 in detail)	85℃ 3,000 hours +R				Lug	250 to 450	330 to 2,200
Screw-mount Terminal Type	General Purpose	SME	Screw terminal, general	85℃ 2,000 hours +R	●			Screw	10 to 250	560 to 680,000
		KMH	Screw terminal, general	105℃ 2,000 hours +R	●			Screw	10 to 400	180 to 680,000
	For Inverter	RWG	85℃, high ripple, downsized, long life	85℃ 5,000 hours +R				Screw	350 to 450	1,500 to 18,000
		RWF	High ripple, long life	85℃ 5,000 hours +R				Screw	350 to 450	820 to 22,000
		RWE	High ripple	85℃ 2,000 hours +R	●			Screw	350 to 550	100 to 12,000
		RWY	High ripple, long life, low cost	85℃ 5,000 hours +R				Screw	350 to 450	500 to 14,000
		RWL	High ripple, long life	85℃ 20,000 hours +R				Screw	350 to 450	2,200 to 12,000
		FTP	Ellips can shape, high ripple	85℃ 5,000 hours +R				Screw	63 to 450	270 to 21,000
		LXA	Long life	105℃ 2,000/5,000 hours +R				Screw	10 to 525	330 to 390,000
		LXR	High ripple, long life	105℃ 5,000 hours +R				Screw	350 to 450	2,200 to 15,000
		LWY	Low cost (Ask Engineering Bulletin No714 in detail)	105℃ 5,000 hours +R				Screw	350 to 450	460 to 13,000
		KW	Low impedance (Ask Engineering Bulletin in detail)	105℃ 2,000 hours		●		Screw	10 to 100	1,000 to 100,000

: Promotional products

▲ : Some of range are solvent-proof.

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CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

◆SURFACE MOUNT

Vertical SMD

Upgrade! PXA → Lower ESR → Upgrade! PXE → Lower ESR → NEW! PXF

High Temperature

PXH

Digitalization Super Low ESR

◆RADIAL LEAD

Radial type

Upgrade! PS → Lower ESR → PSA → Lower ESR → Upgrade! PSC

Digitalization Super Low ESR

ALUMINUM ELECTROLYTIC CAPACITORS

◆SURFACE MOUNT

Digitalization

Downsized

MVA 85℃ High CV
MVE 105℃ High CV

Low Profile

MVS 4.5mmL

Low Impedance

MLA 105℃ 3,000H → NEW! MZD 105℃ 5,000H
Longer life
Longer life
MVY 105℃ → MZA 105℃ 2,000H
Lower Z

Large size (φ12.5 to φ18)

MVA 85℃ High CV
MVE 105℃ High CV
MVY 105℃ Low Z
MVH 125℃

SURFACE MOUNT (Vertical)

MV 85℃
MKA 105℃
MVK 105℃
Higher Reflow Temp.

105℃ Long Life

MVJ 2,000H → MVL 3,000/5,000H → NEW! MLD 5,000H
Longer life
Longer life
NEW! MKB 3,000H

High Temperature

NEW! MHB 125℃
MVH 125℃

Automotive Application

◆RADIAL LEAD

Low Profile

5mmL

SRM 85℃
High CV
SRE 85℃ KRE 105℃

7mmL & Low Profile

SRG 85℃ KRG 105℃
High CV
SRA 85℃ KMA 105℃

105℃ Low Impedance

Power Supply Output Filter

LXY High Reliability → LXZ High Reliability
LXV Low Z
Lower Z
KY Long Life・Low Z → KZE Lower Z → KZH Lower Z → KZM Long Life・Low Z

RADIAL TYPE STANDARD

SMG 85℃ Standard
KMG 105℃ Standard
SMH 160 to 450V
KMH 160 to 450V
SMQ 85℃ Downsize
KMQ 105℃ Downsize

No Sparks against Over-voltage

KLG 2,000H → KLJ 2,000H
Downsized

High Ripple Current / Longlife

PAG 2,000H → KXG 8,000/10,000H → Upgrade! KXJ 10,000/12,000H
Downsized

Adapter/ Ballast

For Strobe

PH

For Motherboard

KZG → KZJ
Lower Z
Lower Z
NEW! KZV

Low LC

LLA 85℃

Long Life

FL 3,000H

High Temperature (125℃)

GXE 2,000 to 5,000H
GXL 5,000/10,000H
GPA 3,000/5,000H

Automotive Application

High Temperature (150℃)

NEW! GHA

For Airbag

LBG

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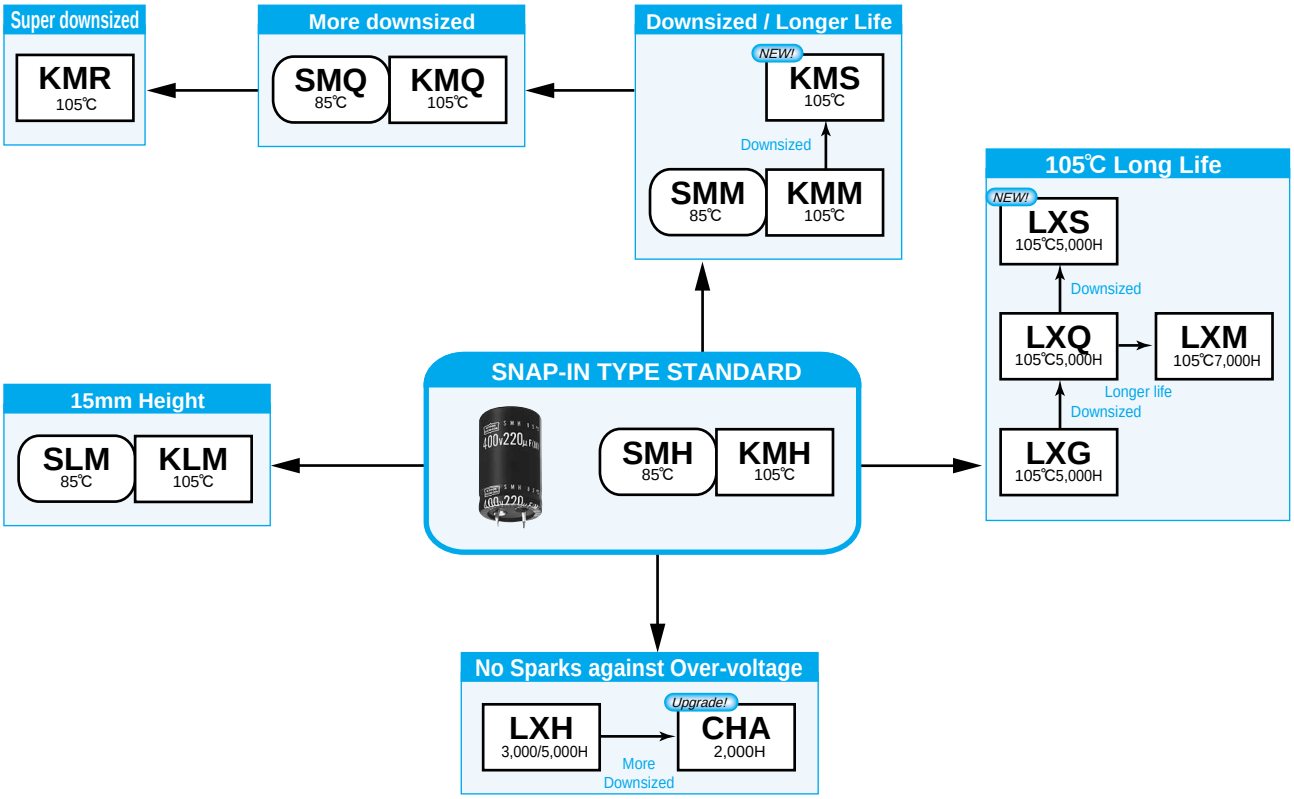
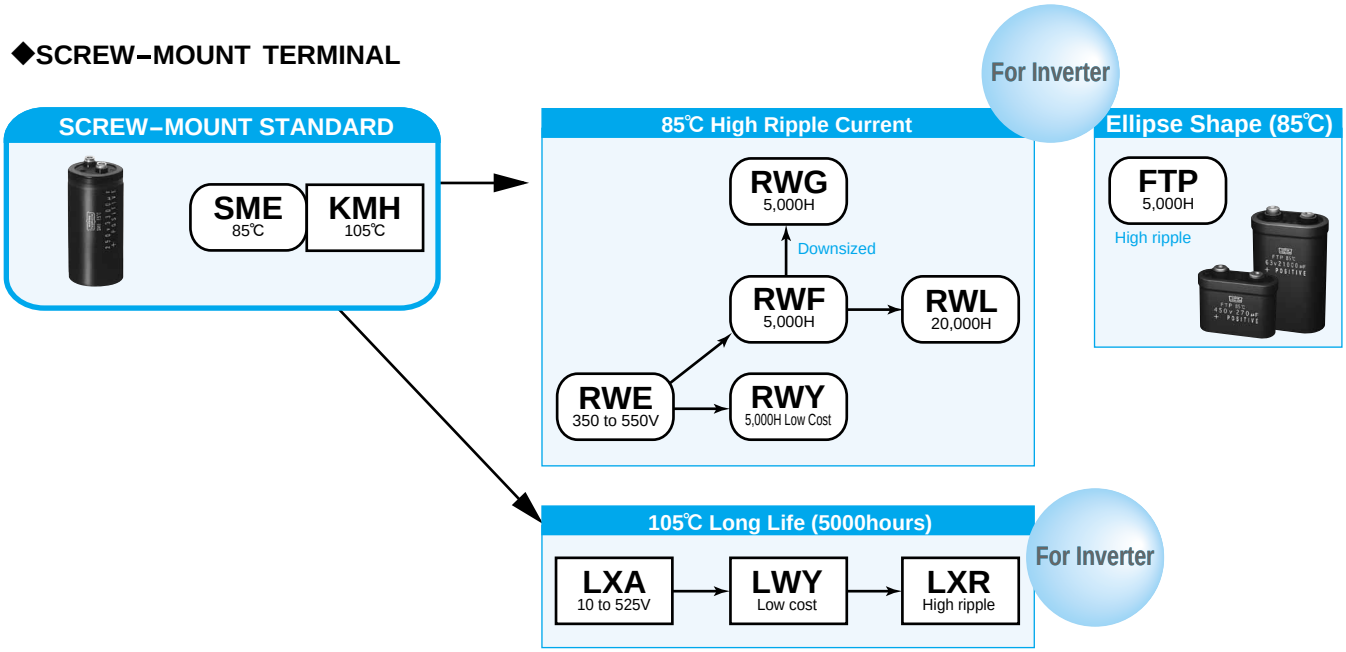
ALUMINUM ELECTROLYTIC CAPACITORS

◆SNAP-IN



◆SCREW–MOUNT TERMINAL



PRECAUTIONS AND GUIDELINES

For conductive polymer aluminum electrolytic solid capacitors, please refer to PRECAUTIONS AND GUIDELINES (Conductive Polymer)

Designing Device Circuits

1 Select the capacitors to suit installation and operating conditions, and use the capacitors to meet the performance limits prescribed in this catalog or the product specifications.

2 Polarity

Aluminum Electrolytic Capacitors are polarized.
Apply neither reverse voltage nor AC voltage to polarized capacitors. Using reversed polarity causes a short circuit or venting. Before use, refer to the catalog, product specifications or capacitor body to identify the polarity marking. (The shape of rubber seal does not represent the directional rule for polarity.)
Use a bi-polar type of non-solid aluminum electrolytic capacitor for a circuit where the polarity is occasionally reversed.
However, note that even a bi-polar aluminum electrolytic capacitor must not be used for AC voltage applications.

3 Operating voltage

Do not apply a DC voltage which exceeds the full rated voltage. The peak voltage of a superimposed AC voltage (ripple voltage) on the DC voltage must not exceed the full rated voltage.
A surge voltage value, which exceeds the full rated voltage, is prescribed in the catalogs, but it is a restricted condition, for especially short periods of time.

4 Ripple current

The rated ripple current has been specified at a certain ripple frequency. The rated ripple current at several frequencies must be calculated by multiplying the rated ripple current at the original frequency using the frequency multipliers for each product series. For more details, refer to the paragraph of Life of Aluminum Electrolytic Capacitors.

5 Category temperature

The use of a capacitor outside the maximum rated category temperature will considerably shorten the life or cause the capacitor to vent.
The relation between the lifetime of aluminum electrolytic capacitors and ambient temperature follows Arrhenius' rule that the lifetime is approximately halved with each 10℃ rise in ambient temperature.

6 Life expectancy

Select the capacitors to meet the service life of a device.

7 Charge and discharge

Do not use capacitors in circuits where heavy charge and discharge cycles are frequently repeated. Frequent and sharp heavy discharging cycles will result in decreasing capacitance and damage to the capacitors due to generated heat. Specified capacitors can be designed to meet the requirements of charging-discharging cycles, frequency, operating temperature, etc.

8 Failure mode of capacitors

Non-solid aluminum electrolytic capacitors, in general, have a lifetime which ends in an open circuit, the period is dependent upon temperature. Consequently, lifetime of capacitors can be extended by reducing the ambient temperature and/or ripple current.

9 Insulating

a) Electrically isolate the following parts of a capacitor from the negative terminal, the positive terminal and the circuit traces.
- The outer can case of a non-solid aluminum capacitor.
- The dummy terminal of a non-solid aluminum capacitor, which is designed for mounting stability.

b) The outer sleeve of a capacitor is not assured as an insulator (Except for screw type). For applications that require an insulated outer sleeve, a custom-design capacitor is recommended to.

10 Condition

Do not use/expose capacitors to the following conditions.
a) Oil, water, salty water take care to avoid storage in damp locations.
b) Direct sunlight
c) Toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or its compounds, and ammonium
d) Ozone, ultraviolet rays or radiation
e) Severe vibration or mechanical shock conditions beyond the limits prescribed in the catalogs or the product specification.

11 Mounting

a) The paper separators and the electrolytic-conductive electrolytes in a non-solid aluminum electrolytic capacitor are flammable.
Leaking electrolyte on a printed circuit board can gradually erode the copper traces, possibly causing smoke or burning by short-circuiting the copper traces.
Verify the following points when designing a PC board.
- Provide the appropriate hole spacing on the PC board to match the terminal spacing of the capacitor.
- Make the following open space over the vent so that the vent can operate correctly.

Case diameter	Clearance
φ6.3 to φ16mm	2mm minimum
φ18 to φ35mm	3mm minimum
φ40mm and up	5mm minimum

- Do not place any wires or copper traces over the vent of the capacitor.
- Installing a capacitor with the vent facing the PC board needs an appropriate ventilation hole in PC board.
- Do not pass any copper traces beneath the seal side of a capacitor. The trace must pass 1 or 2mm to the side of the capacitor.
- Avoid placing any heat-generating objects adjacent to a capacitor or even on the reverse side of the PC board.
- Do not pass any via holes or underneath a capacitor.
- In designing double-sided PC boards, do not locate any copper trace under the seal side of a capacitor.

b) Do not mount the terminal side of a screw mount capacitor downwards. If a screw terminal capacitor is mounted on its side, make sure the positive terminal is higher than the negative terminal.
Do not fasten the screws of the terminals and the mounting clamps over the specified torque prescribed in the catalog or the production specification.
c) For a surface mount capacitor, design the copper pads of the PC board in accordance with the catalog or the product specifications.

12 Others

a) The electrical characteristics of capacitors vary in respect to temperature, frequency and service life. Design the device circuits by taking these changes into account.
b) Capacitors mounted in parallel need the current to flow equally through the individual capacitors.
c) Capacitors mounted in series require resistors in parallel with the individual capacitors to balance the voltage.
d) Using capacitor for applications which always consider safety. Consult with our factory before use in applications which can affect human life.(space equipment, aerial equipment, nuclear equipment, medical equipment, vehicle control equipment, etc) Please note that the product, which is

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PRECAUTIONS AND GUIDELINES

designed only for specific usage can not be used in other usages.(ex. Photo flash type, etc.)

Installing Capacitors

1 Installing

a) Used capacitors are not reusable, except in the case that the capacitors are detached from a device for periodic inspection to measure their electrical characteristics.
b) If the capacitors have self charged, discharge in the capacitors through a resistor of approximately 1kΩ before use.
c) If capacitors are stored at a temperature of 35℃ or more and more than 75%RH, the leakage current may increase. In this case, they can be reformed by applying the rated voltage through a resistor of approximately 1kΩ.
d) Verify the rated capacitance and voltages of the capacitors when installing.
e) Verify the polarity of the capacitors.
f) Do not use the capacitors if they have been dropped on the floor.
g) Do not deform the cases of capacitors.
h) Verify that the lead spacing of the capacitor fits the hole spacing in the PC board before installing the capacitors. Some standard pre-formed leads are available.
i) For pin terminals or snap-in terminals, insert the terminals into PC board and press the capacitor downward until the bottom of the capacitor body reaches PC board surface.
j) Do not apply any mechanical force in excess of the limits prescribed in the catalogs or the product specifications of the capacitors.
Also, note the capacitors may be damaged by mechanical shocks caused by the vacuum/insertion head, component checker or centering operation of an automatic mounting or insertion machine.

2 Soldering and Solderability

a) When soldering with a soldering iron
- Soldering conditions (temperature and time) should be within the limits prescribed in the catalogs or the product specifications.
- If the terminal spacing of a capacitor does not fit the terminal hole spacing of the PC board, reform the terminals in a manner to minimize a mechanical stress into the body of the capacitor.
- Remove the capacitors from the PC board, after the solder is completely melted, reworking by using a soldering iron minimizes the mechanical stress to the capacitors.
- Do not touch the capacitor body with the hot tip of the soldering iron.

b) Flow soldering
- Do not dip the body of a capacitor into the solder bath only dip the terminals in. The soldering must be done on the reverse side of PC board.
- Soldering conditions (preheat, solder temperature and dipping time) should be within the limits prescribed in the catalogs or the product specifications.
- Do not apply flux to any part of capacitors other than their terminals.
- Make sure the capacitors do not come into contact with any other components while soldering.

c) Reflow soldering
- Soldering conditions (preheat, solder temperature and dipping time) should be within the limits prescribed in the catalogs or the product specifications.
- When setting the temperature infrared heaters, consider that the infrared absorption causes material to be discolored and change in appearance.
- Do not solder capacitors more than once using reflow. If you need to twice, be sure to consult us.
- Make sure capacitors do not come into contact with copper traces.

d) Do not re-use surface mount capacitors which have already been soldered.
In addition, when installing a new capacitor onto the assembly board to rework, remove old residual flux from the surface of the PC board, and then use a soldering iron within the prescribed conditions.
e) Confirm before running into soldering that the capacitors are for reflow soldering.

3 Handling after soldering

Do not apply any mechanical stress to the capacitor after soldering onto the PC board.
a) Do not lean or twist the body of the capacitor after soldering the capacitors onto the PC board.
b) Do not use the capacitors for lifting or carrying the assembly board.
c) Do not hit or poke the capacitor after soldering to PC board.
When stacking the assembly board, be careful that other components do not touch the aluminum electrolytic capacitors.
d) Do not drop the assembly board.

4 Cleaning PC board

a) Do not wash capacitors by using the following cleaning agents.
- Halogenated solvents; cause capacitors to fail due to corrosion.
- Alkali system solvents; corrode (dissolve) an aluminum case.
- Petroleum system solvents; cause the rubber seal material to deteriorate.
- Xylene; causes the rubber seal material to deteriorate.
- Acetone; erases the marking.

Solvent-proof capacitors are only suitable for washing using the cleaning conditions prescribed in the catalogs or the product specifications. In particular, ultrasonic cleaning will accelerate damaging capacitors.
b) Verify the following points when washing capacitors.
- Monitor conductivity, pH, specific gravity, and the water content of cleaning agents. Contamination adversely affects these characteristics.
- Be sure not to expose the capacitors under solvent rich conditions or keep capacitors inside a closed container. In addition, please dry the solvent sufficiently on the PC board and the capacitor with an air knife (temperature should be less than the maximum rated category temperature of the capacitor) over 10 minutes.
Aluminum electrolytic capacitors can be characteristically and catastrophically damaged by halogen ions, particularly by chlorine ions, though the degree of the damage mainly depends upon the characteristics of the electrolyte and rubber seal material. When halogen ions come into contact with the capacitors, the foil corrodes when voltages applied. This corrsion causes ; extremely high leakage current, which causes in line with, venting, and an open circuit.
Global environmental warnings (Greenhouse effects and other environmental destruction by depletion of the ozone layer), new types of cleaning agents have been developed and commercialized as substitutes for CFC-113,1,1,2-trichloroethlene and 1,1,1-trichloroethylene. The following are recommended as cleaning conditions for some of new cleaning agents.

–Higher alcohol system cleaning agents
Recommended cleaning agents:
Pine Alpha ST-100S (Arakawa Chemical)
Clean Through 750H, 750K, 750L, and 710M (Kao)
Technocare FRW-14 through 17 (Toshiba)
Cleaning conditions:

PRECAUTIONS AND GUIDELINES

Using these cleaning agents capacitors are capable of withstanding immersion or ultrasonic cleaning for 10 minutes at a maximum liquid temperature of 60℃. Find optimum condition for washing, rinsing, and drying. Be sure not to rub the marking off the capacitor by contacting any other components or the PC board. Note that shower cleaning adversely affects the markings on the sleeve.

–Non-Halogenated Solvent Cleaning
AK225AES (Asahi Glass)
Cleaning conditions:
Solvent-proof capacitors are capable of withstanding any one of immersion, ultrasonic or vapor cleaning for 5 minutes; exception is 2 minutes max. for KRE, and KRE-BP series capacitors and 3 minutes for SRM series capacitors. However, from a view of the global environmental problems, these types of solvent will be banned in near future. We would recommended not using them as much as possible.

Isopropyl alcohol cleaning agents
IPA (Isopropyl Alcohol) is one of the most acceptable cleaning agents; it is necessary to maintain a flux content in the cleaning liquid at a maximum limit of 2 Wt.%.

5 Precautions for using adhesives and coating materials

a) Do not use any adhesive and coating materials containing halogenated solvent.
b) Verify the following before using adhesive and coating material.
- Remove flux and dust leftover between the rubber seal and the PC board before applying adhesive or coating materials to the capacitor.
- Dry and remove any residual cleaning agents before applying adhesive and coating materials to the capacitors. Do not cover over the whole surface of the rubber seal with the adhesive or coating materials.
- For permissible heat conditions for curing adhesives or coating materials, follow the instructions in the catalogs or the product specifications of the capacitors.
- Covering over the whole surface of the capacitor rubber seal with resin may result in a hazardous condition because the inside pressure cannot release completely. Also, a large amount of halogen ions in resins will cause the capacitors to fail because the halogen ions penetrate into the rubber seal and the inside of the capacitor.

c) Some of coating material cannot be curred over the capacitor. Please note that loose luster and whitening on the surface of the outer sleeve might be caused according to the kind of solvents used for mounting adhesives and coating agents.

6 Fumigation

In many cases when exporting or importing electronic devices, such as capacitors, wooden packaging is used. In order to control insects, many times, it becomes necessary to fumigate the shipments. Precautions during “Fumigation” using halogenated chemical such as Methyl Bromide must be taken. Halogen gas can penetrate packaging materials used, such as, cardboard boxes and vinyl bags. Penetration of the halogenide gas can cause corrosion of Electrolytic capacitors.

The Operation of Devices

a) Do not touch a capacitor directly with bare hands.
b) Do not short-circuit the terminal of a capacitor by letting it come into contact with any conductive object.
Also, do not spill electric-conductive liquid such as acid or alkaline solution over the capacitor.
c) Do not use capacitors in circumstance where they would be subject to exposure to the following materials exist or expose.
- Oil, water, salty water or damp location.
- Direct sunlight.
- Toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or its compounds, and ammonium.
- Ozone, ultraviolet rays or radiation.
- Severe vibration or mechanical shock conditions beyond the limits prescribed in the catalogs or product specification.

Maintenance Inspection

a) Make periodic inspections of capacitors that have been used in industrial applications. Before inspection, turnoff the power supply and carefully discharge the electricity in the capacitors. Verify the polarity when measuring the capacitors with a volt-ohm meter. Also, do not apply any mechanical stress to the terminals of the capacitors.
b) The following items should be checked during the periodic inspections.
- Significant damage in appearance : venting and electrolyte leakage.
- Electrical characteristics: leakage current, capacitance, tanδ and other characteristics prescribed in the catalogs or product specifications.
We recommend replacing the capacitors if the parts are out of specification.

In Case of Venting

a) If a non-solid aluminum electrolytic capacitor expells gas when venting, it will discharge odors or smoke, or burn in the case of a short-circuit failure. Immediately turn off or unplug the main power supply of the device.
b) When venting, a non-solid aluminum electrolytic capacitor blows out gas with a temperature of over 100℃. (A solid aluminum electrolytic capacitor discharges decomposition gas or burning gas while the outer resin case is burning.) Never expose the face close to a venting capacitor. If your eyes should inadvertently become exposed to the spouting gas or you inhale it, immediately flush the open eyes with large amounts of water and gargle with water respectively. If electrolyte is on the skin, wash the electrolyte away from the skin with soap and plenty of water. Do not lick the electrolyte of non-solid aluminum electrolytic capacitors.

Storage

We recommend the following conditions for storage.
a) Do not store capacitors at a high temperature or in high humidity. Store the capacitors indoors at a temperature of 5 to 35℃ and a humidity of less than 75%RH.
b) Store the capacitors in places free from water, oil or salt water.
c) Store the capacitors in places free from toxic gasses (hydrogen sulfide, sulfurous acid, chlorine, ammonium, etc.)
d) Store the capacitors in places free from ozone, ultraviolet rays or radiation.
e) Keep capacitors in the original package.
f) It is not applied to a regulation of JEDEC J-STD-020(Rev.C). But MSL (Moisture Sensitivity Level) is suitable for Level 1. A time limit for keeping goods under packed situation is within 3 years after manufacturing.

Disposal

Please consult a local specialist regarding the disposal of industrial waste when disposing aluminum electrolytic capacitors.

Catalogs

Specifications in catalogs may be subject to change without notice. For more details of precautions and guidelines for aluminum electrolytic capacitors, please refer to Engineering Bulletin No. 634A.

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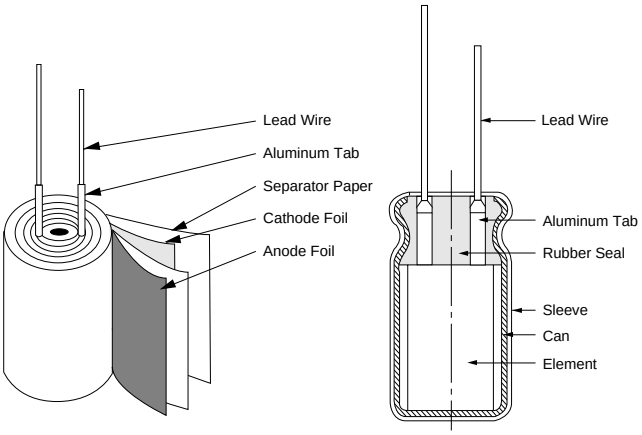
Structure of Aluminum Electrolytic Capacitors

The aluminum electrolytic capacitor contains an internal element of an anode foil, a cathode foil and paper separator rolled together, impregnated with an electrolyte, then attached to external terminals connecting the tabs with the anode or the cathode foils, and sealed in a can case.



Among various types of capacitors, an aluminum electrolytic capacitor offers large CV to volume and features low cost. The capacitance (C) of aluminum electrolytic capacitors, as well as other capacitors, is expressed by the following equation:

$$C=8.854\times10^{-12}\times\frac{\varepsilon S}{d}\ (F)$$

Where : ε=Dielectric constant
S=Surface area of dielectric (m^2)
d=Thickness of dielectric (m)

This equation shows that the capacitance increases in proportion as the dielectric constant becomes high, its surface area becomes large and the thickness of dielectric becomes thin. In aluminum electrolytic capacitors the dielectric constant of an aluminum oxide (Al_2O_3) layer is 8 to 10, which is not as high as compared with the other types of capacitors. However, the dielectric layer of the aluminum oxide is extremely thin (about 15Å per volt) and the surface area is very large. An electrochemical formed electrode foil makes the dielectric on the etched surface of aluminum electrode foil. Electrochemical etching creates 20 to 100 times more surface area as plain foil. Therefore, an aluminum electrolytic capacitor can offer a large capacitance compared with other types.

Primary of Composition Material

Anode aluminum foil:
First, the etching process is carried out electromechanically with a chloride solution which dissolves metal and increases the surface area of the foil; forming a dense network like innumerable microscopic channels. Secondly, the formation process is carried out with a solution such as ammonium borate which forms the aluminum oxide layer (Al_2O_3) as a dielectric at a thickness of about 1.1 to 1.5nm / volt. The process needs to charge more the rated voltage into the foil.

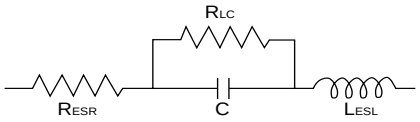
Cathode aluminum foil:
As in the first manufacturing process of the positive foil, the cathode foil requires etching process. Generally, it does not require the formation process; therefore, the natural oxide layer of Al_2O_3, which gives a characteristic dielectric voltage of 1.0 volts, is formed.

Electrolyte and separator:
In a non-solid aluminum electrolytic capacitor, the electrolyte, an electrically conductive liquid, functions as a true cathode by contacting the dielectric oxide layer. Accordingly, the “cathode foil” serves as an electrical connection between the electrolyte and terminal.
The separator functions to retain the electrolyte and prevent the anode and cathode foils from short-circuiting.

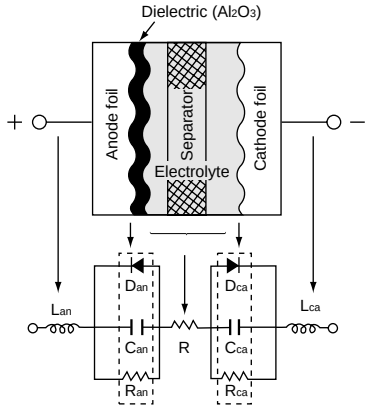
Can case and sealing materials:
The foils and separator are wound into a cylinder to make an internal element, which is impregnated with the electrolyte, inserted into an aluminum can case and sealed. During the service life of a capacitor, electrolyte slowly and naturally vaporizes by electrochemical reaction on the boundary of the aluminum foils. The gas will increase the pressure inside the case and finally cause the pressure relief vent to open or the sealing materials to bulge. The sealing material functions not only to prevent electrolyte from drying out but also to allow the gas to escape out of the can case in a controlled manner.

The Equivalent Circuit

As the equivalent circuit of an aluminum electrolytic capacitor is shown below, it forms a capacitance, a series resistance, an inductance, and a parallel resistance.



R_{ESR}=Equivalent series resistance (ESR)
R_{LC} =Resistance due to leakage current
C =Capacitance
L_{ESL} =Equivalent series inductance



From a composition material point wise, the equivalent circuit is subdivided as follows.

C_{an}, C_{ca}=Capacitance due to anode and cathodes foils
R =Resistance of electrolyte and separator
R_{an}, R_{ca}=Internal resistance of oxide layer on anode and cathode foils
D_{an}, D_{ca}=Diode effects due to oxide layer on anode and cathode foils
L_{an}, L_{ca} =Inductance due to anode and cathode terminals

Basic Electrical Characteristics

Capacitance:
The capacitance of capacitor is expressed as AC capacitance

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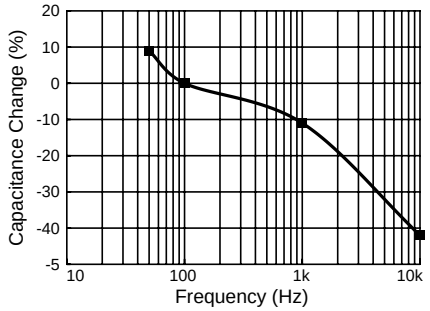
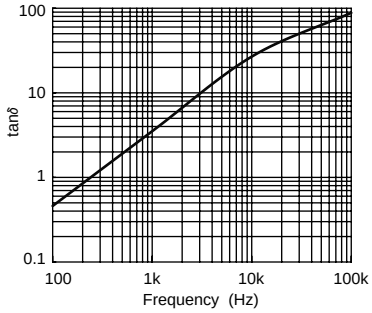
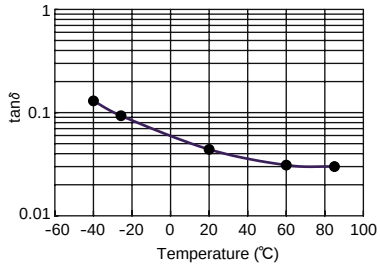
by measuring impedance and separating factors. Also, the AC capacitance depends upon frequency, voltage and other measuring methods. In fact, JIS C 5101 prescribes that the series capacitive factor of an equivalent series( ) circuit shall be the capacitance measured at a frequency of 120Hz and applying a maximum AC voltage of 0.5V rms with a DC bias voltage of 1.5 or 2.0V to aluminum electrolytic capacitors. The capacitance of an aluminum electrolytic capacitor becomes smaller with increasing frequency. See the typical behavior shown below.



Capacitance VS. Frequency

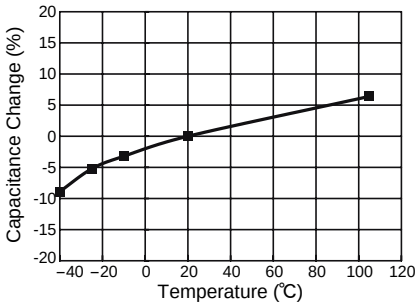


tanδ VS. Frequency



Temperature Characteristics of tanδ

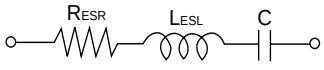
The capacitance value is highly dependent upon temperature and frequency. As the temperature decreases, the capacitance becomes smaller. See the typical behavior shown below.

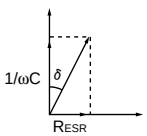


Temperature Characteristics of Capacitance

On the other hand, DC capacitance, which can be measured by applying a DC voltage, shows a slightly larger value than the AC capacitance at a normal temperature and has the flatter characteristic over the temperature range.

tanδ(tangent of loss angle or dissipation factor):
The tanδ is expressed as the ratio of the resistive component (R_{ESR}) to the capacitive reactance ($1/\omega C$) in the equivalent series circuit. Its measuring conditions are the same as the capacitance.





$\tan\delta = R_{ESR} / (1/\omega C) = \omega C R_{ESR}$

Where : R_{ESR}=ESR at 120Hz
ω =2πf
f =120Hz

The tanδ shows higher values as the measured frequency increases and the measured temperature decreases.

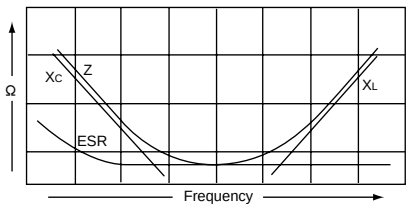
Equivalent series resistance (ESR):
The ESR is the series resistance consisting of the aluminum oxide layer, electrolyte/separator combination, and other resistance related factors, foil length, foil surface area and others.
The ESR value depends upon the temperature. Decreasing the temperature makes the resistivity of the electrolyte increase and leads to increasing ESR.
As the measuring frequency increases, the ESR decreases and reaches an almost constant value that mainly dominates the frequency-independent resistance relating electrolyte/separator combination.

Impedance (Z):
The impedance is the resistance of the alternating current at a specific frequency. It is related to capacitance (C) and inductance (L) in terms of capacitive and inductive reactance, and also related to the ESR. It is expressed as follows:

$$Z = \sqrt{ESR^2 + (X_L - X_C)^2}$$

Where : $X_C = 1/\omega C = 1/2\pi fC$
$X_L = \omega L = 2\pi fL$

As shown below, the capacitive reactance (Xc) dominates at the range of low frequencies, and the impedance decreases with increasing frequency until it reaches the ESR in the middle frequency range. At the range of the higher frequencies the inductive reactance (XL) comes to dominate, so that the impedance increases when increasing the measuring frequency.



Impedance VS.Frequency

As shown at the next page, the impedance value varies with temperature because the resistance of the electrolyte is strongly affected by temperature.

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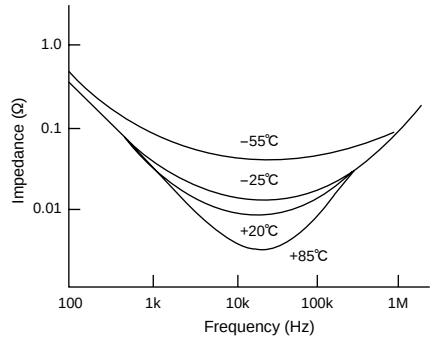
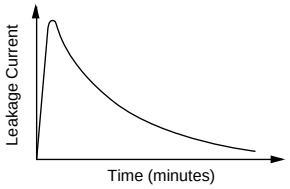


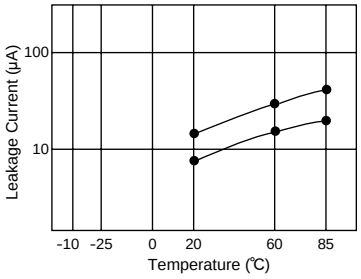
Temperature Characteristics of Impedance

Leakage current:
The dielectric of a capacitor has a very high resistance that does not allow DC current to flow. However, due to the characteristics of the aluminum oxide layer that functions as a dielectric in contact with electrolyte, a small amount of current, called leakage current, will flow to reform and repair the oxide layer when a voltage is being applied. As shown below, a high leakage current flows to charge voltage to the capacitor for the first seconds, and then the leakage current will decrease and reach an almost steady-state value with time.



Leakage Current VS. Time

Measuring temperature and voltage influences the leakage current. The leakage current shows higher values as the temperature and voltage increase.

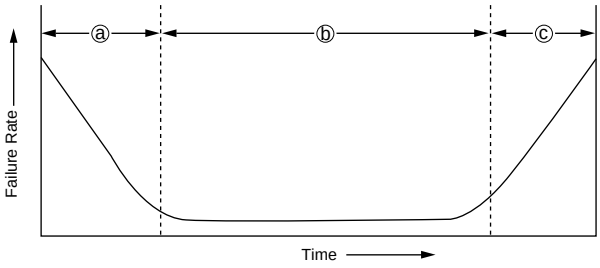


Typical Temperature Characteristics

In general, the leakage current is measured at 20℃ by applying the rated voltage to capacitor through a resistor of 1000Ω in series. The leakage current is the value several minutes later after the capacitor has reached the rated voltage. The catalog prescribes the measuring temperature and time.

Reliability

The bathtub curve:
Aluminum electrolytic capacitors feature failure rates shown by the following bathtub curve.



a) Infant failure period
This initial period accounts for the failures caused by deficiencies in design, structure, the manufacturing process or severe misapplications. In other words the initial failures occur as soon as the components are installed in a circuit. In the case of aluminum electrolytic capacitors, these failures do not occur at customers' field because aging process reforms an incomplete oxide layer, or eliminate the defective parts at the aging process and the sorting process.
Misapplication of the capacitor such as inappropriate ambient conditions, over-voltage, reverse voltage, or excessive ripple current should be avoided for proper use of the capacitor in a circuit.

b) Useful life period
This random failure period exhibits an extremely low failure rate. These failures are not related to operating time but to application conditions. During this period, non-solid aluminum electrolytic capacitors lose a small amount of electrolyte. The electrolyte loss shows as a slow decrease in capacitance and a slow increase in tanδ and ESR. Non-solid aluminum electrolytic capacitors still exhibit lower catastrophic failures than semiconductors and solid tantalum capacitors.

c) Wear-out failure period
This period reflects a deterioration in the component properties of the capacitor ; the failure rate increases with time. Non-solid aluminum electrolytic capacitors end their useful life during this period.

Failure types:
The two types of failures are classified as catastrophic failures and wear-out failures as follows.

1) Catastrophic failures
This is a failure mode that destroys the function of the capacitor like a short circuit or open circuit failure.

2) Wear-out failures
This is a failure mode where gradually deteriorates; the electrical parameters of the capacitor. The criteria of judging the failures, vary with application and design factors. Capacitance decreases and tanδ increases are caused by the loss of electrolyte in the wear-out failure period. This is primary due to loss of electrolyte by diffusion (as vapor) through the sealing material. Gas molecules can diffuse out through the material of the end seal. High temperature increase the electrolyte vapor pressure within the capacitor and the diffusion rate is therefore increased. This increases internal pressure may cause the seal to bulge caused by elevated temperatures. This bulging may accelerate diffusion and mechanically degrade the seal. Factors that can increase the capacitor temperature, such as ambient temperature and ripple current, can accelerate the wear-out phase of a capacitor.

Failure modes:
Aluminum electrolytic capacitors show various failure modes in different applications. (See Table 1.)

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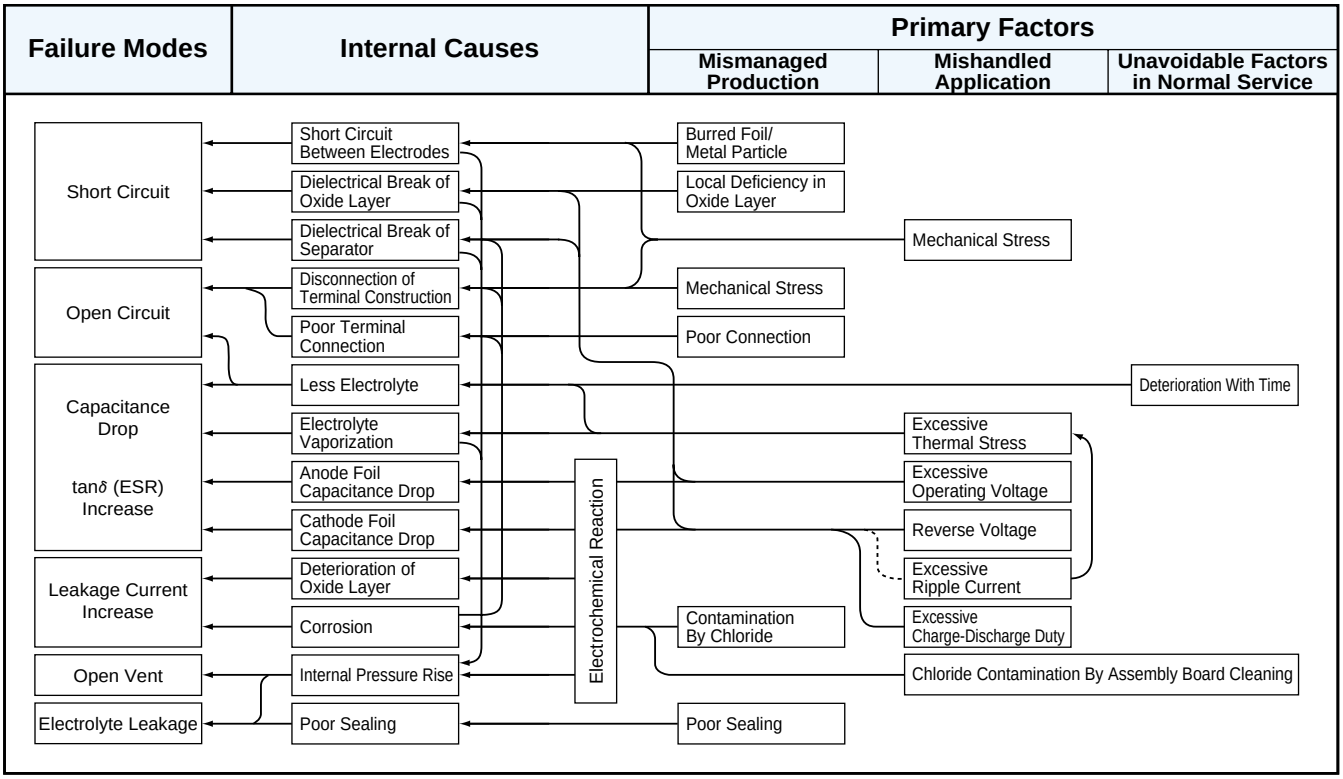

Table1

Life of Aluminum Electrolytic Capacitors

The life of aluminum electrolytic capacitors is largely dependent on environmental and electrical factors. Environmental factors include temperature, humidity, atmospheric pressure and vibration. Electrical factors include operating voltage, ripple current and charge-discharge duty cycles. The factor of temperature (ambient temperature and internal heating due to ripple current) is the most critical to the life of aluminum electrolytic capacitors.

General formula to estimate lifetime:
The lifetime of non-solid aluminum electrolytic capacitors is generally expressed by using three elements representing the effects of ambient temperature, applying voltage and ripple current, which is shown by the following equation:

$$L_X = L \cdot K_{Temp} \cdot K_{Voltage} \cdot K_{Ripple}$$

Where : L_X =Lifetime of capacitor to be estimated
L_o =Base lifetime of capacitor
K_{Temp} =Ambient temperature accelation term
$K_{Voltage}$=Voltage accelation term
K_{Ripple} =Ripple current accelation term

K_{Temp} (Effects of ambient temperature on life):
Because an aluminum electrolytic capacitor is essentially an electrochemical component, increased temperatures accelerate the chemical reaction producing gas within the capacitor which is diffused through the end seal, and consequently accelerates a gradual decrease in capacitance and a gradual increase in tanδ and ESR. The following equation has been experimentally found to express the relationship between the temperature acceleration factor and the deterioration of the capacitor.

$$L_X = L_O \cdot K_{Temp} = L_O \cdot B^{(T_O - T_X)/10}$$
$$K_{Temp} = B^{(T_O - T_X)/10}$$

Where : L_X =Lifetime (hour) of capacitor to be estimated
L_o =Base lifetime (hour) of capacitor
T_o =Maximum rated category temperature (℃) of capacitor shown in catalog
T_X =Actual ambient temperature (℃) of capacitor
B =Temperature accelation factor (≃2)

This equation is similar to Arrhenius' equation that expresses a relationship between chemical reaction rates and temperature, and called Arrhenius' rule of aluminum electrolytic capacitors. The temperature acceleration factor (B) is approximately 2 over an ambient temperature range (Tx) from 40℃ to the maximum rated category temperature of each capacitor. It means that the lifetime is approximately halved with every 10℃ rise in ambient temperature and can be extended by using the capacitors at low temperatures. For an ambient temperature range (Tx) of 20℃ to 40℃, the factor B will be close to 2, and the lifetime will actually be extended. However, operating and surrounding conditions, especially the operating conditions influence ambient temperatures mutually. The ambient temperature in this range will be very changeable; therefore, lifetime estimation under 40℃ should use 40 as Tx.

$K_{voltage}$ (Effects of applying voltage to life):
Miniature and large sized aluminum electrolytic capacitors for popular applications, such as surface mount types, radial lead types, snap-in types and block types, have little voltage effect on their life. Other factors like temperature and ripple current determine the life in comparison with voltage, as long as the capacitors are used at voltages and temperatures within the specifications prescribed in the catalog. Consequently, $K_{voltage}$=1 is used for these capacitors. 350V and higher screw-mount terminal types of capacitors for customer-use power electronics applications allow the life time to extend by applying low voltage, relating to the characteristics of their aluminum oxide layer. RWE, RWY, RWL, RWF, LX(Screw-mount), LXA(Screw-mount) and LXR series are applicable to the method. For $K_{voltage}$ values of these products, please contact a representative of Nippon Chemi-Con.

K_{ripple} (Effects of ripple current to life):
Aluminum electrolytic capacitors have higher tanδ than any other types of capacitors; therefore, the ripple current gives aluminum electrolytic capacitors higher internal heat. Be sure to check the rated ripple current which is specified in the catalog for assuring the life.

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The ripple current through the capacitor produces heat by dissipating power from the capacitor. This leads to temperature increase. Internal heating produced by ripple currents can be expressed by:

$$W=(I_{Ripple})^2 \cdot R_{ESR}+V \cdot I_{Leakage}$$

Where : W =Internal power loss
I_{Ripple} =R.M.S. ripple current
R_{ESR} =Internal resistance (ESR) at ripple frequency
V =Applied voltage
$I_{Leakage}$=Leakage current

Leakage current may be 5 to 10 times higher than the values measured at 20℃, but compared with Iripple , the leakage current value is very small and negligible.
Thus, the above equation can be simplified:

$$W=(I_{Ripple})^2 \cdot R_{ESR}$$

The following equation gives the internal heat rise; it is heat rise to stable condition. (It is necessary to input several factors.):

$$(I_{Ripple})^2 \cdot R_{ESR}= \beta \cdot A \cdot \Delta T$$

Where : β =Heat transfer constant
A =Surface area of can case
$A=(\pi/4) \cdot D \cdot (D+4L)$
Where : D=Can diameter
L=Can length
ΔT=An increase in core temperature by internal heating due to ripple current
(ΔT=Core temperature−Ambient temperature)

From the above equation, internal temperature rise (ΔT) produced by ripple current is given by:

$$\Delta T=(I_{Ripple})^2 \cdot R_{ESR} / (\beta \cdot A)$$

When the ripple frequency is 120Hz, R_{ESR} at 120Hz is expressed by

$$R_{ESR}=\tan\delta / (\omega \cdot C)$$

$$\Delta T=(I_{Ripple})^2 \cdot \tan\delta / (\beta \cdot A \cdot \omega \cdot C)$$

Where : tanδ=120Hz value
ω =$2\pi \cdot f=2\pi \cdot 120$Hz
C =120Hz capacitance value

As above equation, ΔT varies with frequency of ripple, frequency and temperature dependent ESR, and application dependent β (even ripple current is constant). We really recommend that customers measure ΔT with a thermocouple at the actual operating conditions of the application in lieu of using the above equation. (Another approximation of ΔT will be stated later.)
As mentioned in the paragraph of K_{Temp}, aluminum electrolytic capacitors will slowly increase in tanδ and ESR during their service life. The application without ripple current has no influence on the life of the capacitor even though the ESR will increase during life. In other words, the application with ripple current makes ΔT increase; furthermore, a ΔT increase results in ESR increase. The ESR increase then makes ΔT increase. It is a chain reaction. Theoretically, the ripple current acceleration term (K_{Ripple}) cannot be simply expressed like the ambient temperature acceleration term (K_{Temp}). Practically, the ripple current acceleration term (K_{Ripple}) can be approximately expressed by an equation using a ΔT initially measured. The following table shows the ripple current acceleration term (K_{Ripple}) for each capacitor design group.

K_{Ripple}		Products	
		Type	Series
$2^{(-\Delta T/5)}$		Surface mount	MVS, MVA, MV, MVE, MVK, MKA, MZA, MVY, MLA MVJ, MVL, MVH, MV-BP, MVK-BP
		Radial lead	KMA, KME-BP, KRE, KRG, LLA, SME, SMQ, SME-BP, SMG, SRA, SRE,SRG,SRM
		Screw-mount terminal	KW
$2^{(\Delta To-\Delta T)/5}$	ΔTo=5 deg	Radial lead	FL, GXE(To≦105℃), KLG, KME, KMQ, KMF, KMG, KMH, KMX, KXG, PAG, LBG, LXV, LXY, LXZ, KZM, KZH, KZE, KY, KXJ, GPA, KLJ, KMR
		Pin terminal	KMH, KMM, KMQ, LXG, LXM, LXH, LXQ, CHA
		Screw-mount terminal	LXA (10 to 250Vdc), KMH
	ΔTo=5 to 10 deg Contact us for details	Radial lead	SMH
		Pin terminal	SMH, SMM, SMQ, SLM, RWE-LR
		Screw-mount terminal	SME
$2^{[-2+(25-\Delta T)/b]}$		Screw-insert terminal	LXA (350 to 525Vdc), RWE, RWF, RWL, LXR, RWY, RWG

Note : ΔT = An increase (deg) in core temperature produced by internal heating due to actual operating ripple current. The ΔT is the difference between the core temperature and ambient temperature measured at the actual operating conditions.
ΔTo = An increase (deg) in core temperature by internal heating due to rated ripple current.
b = Factor b varies from 5 to 10 by the conditions of ripple frequency and ΔT. Please contact a representative of Nippon Chemi-Con for the details

Note that a ΔT over a certain maximum limit may over-heat the capacitors, though the lifetime estimation will not give you practical lifetime. For instance, the following shows a guide limit of ΔT at each ambient temperature for 105℃ maximum rated products.

Ambient temperature Tx (℃)	85	105
Guide limit of ΔT (deg)	15	5
Core temperature (=Tx+ΔT)	100	110

Approximation of ΔT

Estimation of the lifetime requires two temperature measurements; first obtain ΔT by actually measuring the core temperature, inserting the thermocouple inside the operating capacitor and secondary, the ambient temperature. A more convenient way to get the ΔT is to convert the surface temperature of the capacitor case and the ambient temperature by using a coefficient specified for each case diameter as follows:

$$\Delta T=Kc \cdot (Ts-Tx)$$

Where : Kc=Coefficient from table below
Ts=Surface temperature (deg) of capacitor can case
Tx=Ambient temperature (deg)

No air flow conditions.

Diameter (mm)	ϕ5 to ϕ8		ϕ10	ϕ12.5	ϕ16	ϕ18	ϕ22	ϕ25
Kc	1.10		1.15	1.20	1.25	1.30	1.35	1.40
Diameter (mm)	ϕ30	ϕ35	ϕ40	ϕ50	ϕ63.5	ϕ76	ϕ89	ϕ100
Kc	1.50	1.65	1.75	1.90	2.20	2.50	2.80	3.10

Also, you can roughly estimate a ΔT by using the following equation without need to measure.

PRECAUTIONS AND GUIDELINES

$$\Delta T=\Delta T_0 \cdot (Ix/Io)^2$$

Where : ΔT_0=5 deg for 105℃ maximum rated capacitors.
Io =Rated ripple current (A_{RMS}) : if its frequency is different from operating ripple current Ix, it needs converting by using a frequency multiplier prescribed in the catalog.
Ix =Operating ripple current (A_{RMS}) actually flowing into a capacitor

Like switching power supplies, if the operating ripple current consists of commercial frequency element and switching frequency element(s), an internal power loss is expressed by the following equation.

$$W= (If_1)^2 \cdot ESR_{f1} + (If_2)^2 \cdot ESR_{f2} + \cdots + (If_n)^2 \cdot ESR_{fn}$$

Where : W =Internal power loss
$If_1 \cdots If_n$ =Ripple currents at every frequencies f1···fn
$ESR_{f1} \cdots ESR_{fn}$=ESR's at every frequencies f 1···fn

The above equation can be transformed into another equation to get a ripple current value in accordance with the frequency of the rated ripple current, each of $ESR_{f1}, \cdots ESR_{fn}$ is approximately equal to ESR_{f0} divided by square value of the frequency multiplier ($F_{f1} \cdots F_{fn}$). Here ESR^{f0} is the value at the frequency of the rated ripple current and $F_{f1} \cdots F_{fn}$ is a conversion coefficient from one frequency to another in accordance with the frequency f1···fn.

$$ESR_{f1}=ESR_{f0} / (Ff_1)^2$$
$$\vdots \qquad \vdots$$
$$ESR_{fn}=ESR_{f0} / (Ff_n)^2$$

Relationship of $w=(L_{Ripple})^2 \cdot R_{ESR}$ leads Ix as follows:

$$Ix=\sqrt{W/ESR_{f0}}$$

The above is rewritten in the following equation:

$$Ix=\sqrt{(If_1/F_{f1})^2+(If_2/F_{f2})^2+\cdots\cdots(If_n/F_{fn})^2}$$

Where : Ix =Ripple current in accordance with the frequency of the rated ripple current
$If_1 \cdots\cdots If_n$ =Operating ripple currents at every frequency f1···fn
$F_{f1} \cdots\cdots F_{fn}$=Frequency multipliers for every frequency f1···fn prescribed in the catalog, based on the fact that the internal resistance of a capacitor varies with frequency.

Cleaning Agents

a. Cleaning agents penetrate into a capacitor.
Solvent contacts the rubber seal of a capacitor. Some percentage of solvent does not penetrate but a percentage suceeds in entering and defusing inside the capacitor.

b. Cleaning agents decompose and release halogen ions.
In the electrolyte of the inside element, the halides in the cleaning agents become hydrolyzed and release halogen ions as follows,

$$RX+H_2O \rightarrow ROH+H^+ + X^-$$

RX : Halide
X^- : Halogen ion

c. Corrosion
The halogen ions attack the aluminum foil by the following anodic half-cell reaction:

$$Al+3X^- \rightarrow AlX_3+3e$$

The AlX3 further becomes hydrolyzed and release the halogen ion again:

$$AlX_3+3H_2O \rightarrow Al(OH)^3+3H^+ +3X^-$$

The halogen ions release by this hydrolysis reaction further attacks the aluminum according to the previous reaction formula, and these reactions are repeated and accelerated when voltage and temperature is applied. Also, the hydrogen ions increase the local acidity which causes the oxide dielectric to dissolve. Thus, localized corrosion accelerates to corrode both the aluminum metal and the dielectric. In addition, a terpene or petroleum system cleaning solvent will be absorbed into the rubber seal of the capacitor. The rubber seal finally weakens. An alkaline saponification detergent will damage the aluminum metal and marking. In summary, recommended cleaning agents are halogen free. Terpene, petroleum, alkali detergent and any solvent making the rubber seal material deteriorate are not recommended.

Compatible cleaning agents:
In line with recent global environmental warnings (Greenhouse effect and other environmental destruction by depletion of the ozone layer), new types of cleaning agents have been commercialized and substituted as CFC-113,1,1,2-trichloroethlene and 1,1,1-trichloroethylene. The following are recommended cleaning conditions for some of new cleaning agents.

Higher alcohol system cleaning agents
Recommended cleaning agents:
Pine Alpha ST-100S (Arakawa Chemical)
Clean Through 750H, 750K, 750L, and 710M (Kao)
Technocare FRW-14 through 17 (GE Toshiba Silicones)
Cleaning conditions:
1) Capacitors are capable of withstanding immersion or ultrasonic cleaning for 10 minutes at a maximum liquid temperature of 60℃ using the above cleaning agents. Find the optimum conditions for washing, rinsing, and drying. Be sure not to rub the marking off the capacitor by contact with any other components on the PC board. Note that shower cleaning adversely affects the marking.
2) To rinse by water, control the conditions such as temperature and water pressure to avoid sleeve shrinkage.
3) Clean Through 750H and similar are weak-alkaline solvents. Do not leave the alkaline on the capacitor after cleaning process.

CFCs substitute solvents (HCFC system)
Asahi Glass AK225AES solvent is usable only with solvent-proof type capacitors, which are designed with reinforced seal constructions and modified electrolyte. This product does not penetrate the capacitor and deactivate halogen ions. However, AK225AES is one of the solvents which will have a restricted usage in future from the environmental point of view.

PRECAUTIONS AND GUIDELINES

Non-Halogenated Solvent Cleaning

HCFC solvents: AK225AES (Asahi Glass)
Cleaning conditions:
Solvent-proof type capacitors are capable of withstanding immersion, ultrasonic or vapor cleaning for 5 minutes; exception is 2 minutes max. for KRE and KRE-BP series capacitors for 3 minutes and SRM series capacitors.
Applicable series (only for solvent-proof products):

Surface mount :	MVS, MVA(4 to 63Vdc), MV, MVE(6.3 to 63Vdc), MVK, MKA, MZA, MLA, MVY(6.3 to 63Vdc), MVJ, MVL, MVH(10 to 50Vdc), MV-BP, MVK-BP, PXF, PXE, PXA, PXH, MZD, MLD
Radial lead :	SRM, KRE, KMA, SRG, KRG , SMG(6.3 to 250Vdc), SME-BP, KMQ(6.3 to 100Vdc), KMG(6.3 to 250Vdc), KME-BP, LXZ, LXY, LXV, FL, GXE(10 to 50Vdc), GXL, LBG, LLA, PS, PSC, PSA, GPA

Isopropyl alcohol cleaning agents
IPA (Isopropyl Alcohol) is one of the most acceptable cleaning agents; it is necessary to maintain a flux content in the cleaning liquid at a maximum limit of 2 Wt. %, because chlorides in flux dissolves in the cleaning liquid during the cleaning process.
Xylene -additive IPA may make the rubber seal deteriorate.

Non-clean flux
Both ionic halogen and non-ionic halogens damage the capacitor when they penetrate in through the rubber seal. Note that some of the fluxes called non-halogenated flux contains less ionic halogen activator but actually a large amount of non-ionic halogen.
Per our analysis, AHQ3100K(Asahi) and POZ6(Senjyu) minimize ionic and non-ionic halogens.

Other Precautions to wash capacitors
a) Monitor conductivity, pH, specific gravity and water content of cleaning agents. Contamination adversely affects the characteristics.
b) The solvent may stay between the end seal and the PC board if the capacitor is mounted directly onto the PCB without a small gap. The residual solvent can cause defects. Also, washing for more than the specified time causes solvent residual. Therefore, wash the assembly board for at least 10 minutes at the recommended temperature. Be sure not to expose the capacitors under solvent rich conditions or keep capacitors inside a closed container.
c) Reforming the leads of the capacitor to fit lead spacing on the PC board causes cleaning agents to get into the inside capacitor. This may result in corrosion to the foil. Therefore, use the capacitors, which fit the hole spacing on the PC board or reform the lead wires in a manner which will not cause mechanical stress to the capacitor body.

CAT. No. E1001G

NIPPON CHEMI-CON

PART NUMBERING SYSTEM

A guide to global code (Screw mount terminal type)

(Example : KMH series, 400V-3,300μF, φ63.5×120L, Without mounting clamp)

Refer to the following table about global code for screw mount terminal type

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
E	K	M	H	4	0	1	L	G	N	3	3	2	M	D	C	0	N

- 18 Supplement code⑨
- 15 16 17 Size code⑧
- 14 Capacitance tolerance code⑦
- 11 12 13 Capacitance code⑥
- 10 Mounting clamp code⑤
- 8 9 Terminal code④
- 5 6 7 Voltage code③
- 4 Series code②
- 1 Category①

①Category

Type	Code
	1th
Polar	E

②Series code

Series name	Code		
	2th	3th	4th
SME	S	M	E
No series name	C	S	T

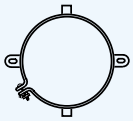
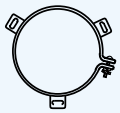
③Voltage code

Voltage (V)	Code		
	5th	6th	7th
10	1	0	0
16	1	6	0
25	2	5	0
35	3	5	0
50	5	0	0
63	6	3	0
80	8	0	0
100	1	0	1
160	1	6	1
200	2	0	1
250	2	5	1
315	3	B	1
350	3	5	1
400	4	0	1
450	4	5	1
500	5	0	1
525	5	C	1
550	5	5	1

④Terminal code

Type	Code	
	8th	9th
Screw terminal	L	G

⑤Mounting clamp code

Type	Code
	10th
	B
	C
Without clamp	N

⑥Capacitance code

Cap. (μF)	Code		
	11th	12th	13th
100	1	0	1
220	2	2	1
330	3	3	1
470	4	7	1
680	6	8	1
1,000	1	0	2
2,200	2	2	2
3,300	3	3	2
4,700	4	7	2
6,800	6	8	2
10,000	1	0	3
22,000	2	2	3
33,000	3	3	3
47,000	4	7	3
68,000	6	8	3
100,000	1	0	4
220,000	2	2	4
330,000	3	3	4
470,000	4	7	4
680,000	6	8	4

⑦Capacitance tolerance

Tol. (%)	Code
	14th
±20	M

⑧Size code

φD	Code
	15th
35	A
50	C
63.5	D
76	E
89	F
100	G

L	Code	
	16th	17th
50	5	0
60	6	0
75	7	5
80	8	0
85	8	5
96	9	6
100	A	0
105	A	5
115	B	5
120	C	0
125	C	5
130	D	0
140	E	0
145	E	5
155	F	5
170	H	0
190	K	0
220	N	0
250	R	0
270	T	0

⑨Supplement code

Sleeve material	Code
	18th
Pb-free PVC	M
Polyolefin	S
PVC	N

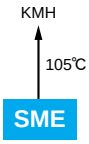
* Refer to the appendix (Global code) for codes does not listed.

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Standard screw terminals, 85℃

SME Series

●Endurance with ripple current : 2,000 hours at 85℃
●**RoHS Compliant**

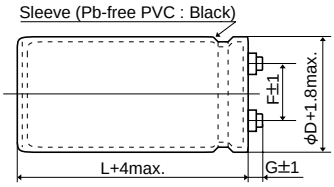


◆SPECIFICATIONS

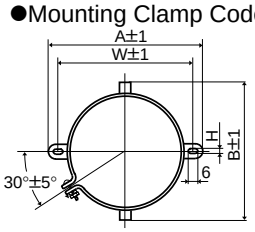
Items	Characteristics
Category Temperature Range	−40 to +85℃ (10 to 100Vdc)　−25 to +85℃ (160 to 250Vdc)
Rated Voltage Range	10 to 250Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.02CV or 5mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Shall not exceed the values shown in the STANDARD RATINGS (at 20℃, 120Hz)
Low Temperature Characteristics	Capacitance change　C(−25℃)/C(+20℃)≧0.7 (at 120Hz)
Insulation Resistance	When measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500Vdc, the insulation resistance shall not be less than 100MΩ.
Insulation Withstanding Voltage	When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 85℃. Capacitance change: ≦±20% of the initial value D.F. (tanδ): ≦200% of the initial specified value Leakage current: ≦The initial specified value
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 85℃ without voltage applied. Capacitance change: ≦±20% of the initial value D.F. (tanδ): ≦150% of the initial specified value Leakage current: ≦The initial specified value

◆DIMENSIONS (Screw-Mount) [mm]

●Terminal Code : LG

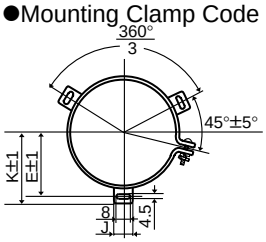


●Mounting Clamp Code : B



ϕD	A	B	W	H	F
35	58.0	44.0	48.0	3.5	12.7
50	78.0	64.0	68.0	4.5	22.4
63.5	90.0	76.0	80.0	4.5	28.0
76	104.5	90.0	93.5	4.5	31.5

●Mounting Clamp Code : C



ϕD	E	K	J	F
50	32.5	37.0	14.0	22.4
63.5	38.1	43.5	14.0	28.0
76	44.5	50.0	14.0	31.5
89	50.8	56.5	16.0	31.5

ϕ35 to ϕ63.5 : G=6
ϕ76 & ϕ89 : G=5

<Screw specifications>
Plus hexagon-headed screw:
M5×0.8×10
Maximum screw tightening torque:
3.23Nm

* The screw and the mounting clamp are separately supplied and not attached to the product.

◆PART NUMBERING SYSTEM

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
E	S	M	E				L	G					M				M

Supplement code
Size code
Capacitance tolerance code
Capacitance code (ex. 680μF:681, 6,800μF:682)
Mounting clamp code (N, B, C)
Terminal code
Voltage code (ex. 10V:100, 100V:101)
Series code
Category

Please refer to "A guide to global code (screw-mount terminal type)"

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Rated voltage (Vdc)	Case diameter (mm)	Frequency (Hz)					
		50	120	300	1k	10k	50k
10 to 50	ϕ35 to ϕ89	0.95	1.00	1.03	1.05	1.09	1.12
63 & 80	ϕ35	0.90	1.00	1.06	1.10	1.18	1.22
	ϕ50 to ϕ89	0.95	1.00	1.03	1.05	1.09	1.12
100	ϕ35	0.82	1.00	1.12	1.22	1.30	1.33
	ϕ50	0.90	1.00	1.06	1.10	1.18	1.22
	ϕ63.5 to ϕ89	0.95	1.00	1.03	1.05	1.09	1.12
160 to 250	ϕ35	0.80	1.00	1.19	1.34	1.46	1.52
	ϕ50 & ϕ63.5	0.81	1.00	1.14	1.26	1.36	1.41
	ϕ76 & ϕ89	0.82	1.00	1.12	1.22	1.30	1.33

The endurance of capacitors is shorted with internal heating produced by ripple current at the rate of halving the lifetime with every 5℃ rise.
When long life performance is required in actual use, the rms ripple current has to be reduced.

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Standard screw terminals, 85℃

SME Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
10	39,000	35×50	0.60	4.70	ESME100LGB393MA50M
	82,000	35×80	0.60	7.40	ESME100LGB823MA80M
	100,000	35×100	0.70	8.00	ESME100LGB104MAA0M
	120,000	35×120	0.70	9.40	ESME100LGB124MAC0M
	150,000	50×80	0.90	9.80	ESME100LGC154MC80M
	220,000	50×100	1.00	12.1	ESME100LGC224MCA0M
	270,000	50×120	1.20	13.6	ESME100LGC274MCC0M
	390,000	63.5×100	1.50	15.3	ESME100LGC394MDA0M
	470,000	63.5×120	2.00	16.0	ESME100LGC474MDC0M
	560,000	76×100	2.50	17.3	ESME100LGC564MEA0M
	680,000	76×120	3.00	18.7	ESME100LGC684MEC0M
16	27,000	35×50	0.45	4.20	ESME160LGB273MA50M
	56,000	35×80	0.60	6.50	ESME160LGB563MA80M
	82,000	35×100	0.70	8.00	ESME160LGB823MAA0M
	100,000	35×120	0.70	9.60	ESME160LGB104MAC0M
	120,000	50×80	0.80	9.60	ESME160LGC124MC80M
	150,000	50×100	0.90	11.2	ESME160LGC154MCA0M
	220,000	50×120	1.00	14.2	ESME160LGC224MCC0M
	270,000	63.5×100	1.20	15.3	ESME160LGC274MDA0M
	330,000	63.5×120	1.30	17.1	ESME160LGC334MDC0M
	390,000	76×100	1.60	18.0	ESME160LGC394MEA0M
	470,000	76×120	1.80	19.3	ESME160LGC474MEC0M
	560,000	76×140	2.00	20.7	ESME160LGC564MEE0M
25	18,000	35×50	0.35	4.00	ESME250LGB183MA50M
	39,000	35×80	0.40	6.20	ESME250LGB393MA80M
	47,000	35×100	0.40	7.40	ESME250LGB473MAA0M
	56,000	35×120	0.45	8.30	ESME250LGB563MAC0M
	82,000	50×80	0.50	9.70	ESME250LGC823MC80M
	100,000	50×100	0.60	10.8	ESME250LGC104MCA0M
	120,000	50×120	0.60	12.8	ESME250LGC124MCC0M
	180,000	63.5×100	0.75	14.7	ESME250LGC184MDA0M
	220,000	63.5×120	0.80	16.8	ESME250LGC224MDC0M
	270,000	76×100	0.90	18.3	ESME250LGC274MEA0M
	330,000	76×120	1.00	20.7	ESME250LGC334MEC0M
	390,000	76×140	1.20	22.1	ESME250LGC394MEE0M
	560,000	89×140	1.50	25.8	ESME250LGC564MFE0M
35	15,000	35×50	0.30	3.90	ESME350LGB153MA50M
	33,000	35×80	0.40	6.00	ESME350LGB333MA80M
	39,000	35×100	0.40	7.00	ESME350LGB393MAA0M
	47,000	35×120	0.45	8.00	ESME350LGB473MAC0M
	68,000	50×80	0.50	9.00	ESME350LGC683MC80M
	82,000	50×100	0.55	10.3	ESME350LGC823MCA0M
	120,000	50×120	0.60	12.8	ESME350LGC124MCC0M
	150,000	63.5×100	0.70	14.0	ESME350LGC154MDA0M
	180,000	63.5×120	0.70	16.6	ESME350LGC184MDC0M
	220,000	76×100	0.75	17.3	ESME350LGC224MEA0M
	270,000	76×120	0.80	19.8	ESME350LGC274MEC0M
	330,000	76×140	0.90	22.5	ESME350LGC334MEE0M
	470,000	89×140	1.00	28.3	ESME350LGC474MFE0M
50	10,000	35×50	0.25	4.10	ESME500LGB103MA50M
	18,000	35×80	0.25	5.20	ESME500LGB183MA80M
	22,000	35×100	0.30	5.90	ESME500LGB223MAA0M
	27,000	35×120	0.35	6.60	ESME500LGB273MAC0M
	39,000	50×80	0.40	7.40	ESME500LGC393MC80M
	56,000	50×100	0.40	9.80	ESME500LGC563MCA0M
	68,000	50×120	0.45	11.1	ESME500LGC683MCC0M
	82,000	63.5×100	0.50	12.2	ESME500LGC823MDA0M
	120,000	63.5×120	0.50	16.0	ESME500LGC124MDC0M
	150,000	76×120	0.60	18.1	ESME500LGC154MEC0M
	180,000	76×140	0.70	19.5	ESME500LGC184MEE0M
	270,000	89×140	0.80	24.6	ESME500LGC274MFE0M
63	5,600	35×50	0.20	3.00	ESME630LGB562MA50M
	10,000	35×80	0.25	4.00	ESME630LGB103MA80M
	15,000	35×100	0.25	5.30	ESME630LGB153MAA0M
	18,000	35×120	0.25	6.20	ESME630LGB183MAC0M
	22,000	50×80	0.30	6.50	ESME630LGC223MC80M
	33,000	50×100	0.35	8.10	ESME630LGC333MCA0M
	39,000	50×120	0.35	9.60	ESME630LGC393MCC0M

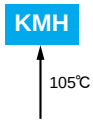
WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
63	47,000	63.5×100	0.40	10.2	ESME630LGC473MDA0M
	68,000	63.5×120	0.40	13.3	ESME630LGC683MDC0M
	100,000	76×120	0.45	17.1	ESME630LGC104MEC0M
	120,000	76×140	0.50	19.0	ESME630LGC124MEE0M
	150,000	89×140	0.55	22.0	ESME630LGC154MFE0M
80	3,300	35×50	0.15	2.50	ESME800LGB332MA50M
	6,800	35×80	0.20	3.70	ESME800LGB682MA80M
	10,000	35×100	0.20	4.90	ESME800LGB103MAA0M
	12,000	35×120	0.20	5.40	ESME800LGB123MAC0M
	15,000	50×80	0.25	6.00	ESME800LGC153MC80M
	22,000	50×100	0.30	7.10	ESME800LGC223MCA0M
	27,000	50×120	0.30	8.60	ESME800LGC273MCC0M
	33,000	63.5×100	0.35	9.30	ESME800LGC333MDA0M
	47,000	63.5×120	0.35	12.0	ESME800LGC473MDC0M
	68,000	76×120	0.35	15.4	ESME800LGC683MEC0M
	82,000	76×140	0.35	18.1	ESME800LGC823MEE0M
	100,000	89×140	0.40	21.0	ESME800LGC104MFE0M
100	2,200	35×50	0.10	2.50	ESME101LGB222MA50M
	4,700	35×80	0.15	3.40	ESME101LGB472MA80M
	6,800	35×100	0.15	4.20	ESME101LGB682MAA0M
	8,200	35×120	0.15	5.00	ESME101LGB822MAC0M
	10,000	50×80	0.20	5.20	ESME101LGC103MC80M
	18,000	50×120	0.20	8.10	ESME101LGC183MCC0M
	22,000	63.5×100	0.25	8.60	ESME101LGC223MDA0M
	27,000	63.5×120	0.25	10.3	ESME101LGC273MDC0M
	33,000	76×100	0.25	11.1	ESME101LGC333MEA0M
	39,000	76×120	0.25	12.4	ESME101LGC393MEC0M
	47,000	76×140	0.25	14.3	ESME101LGC473MEE0M
	68,000	89×140	0.30	18.0	ESME101LGC683MFE0M
160	1,200	35×50	0.15	2.00	ESME161LGB122MA50M
	2,200	35×80	0.15	3.40	ESME161LGB222MA80M
	2,700	35×100	0.15	3.70	ESME161LGB272MAA0M
	3,300	35×120	0.15	4.50	ESME161LGB332MAC0M
	4,700	50×80	0.20	5.60	ESME161LGC472MC80M
	6,800	50×100	0.20	7.50	ESME161LGC682MCA0M
	8,200	50×120	0.20	8.10	ESME161LGC822MCC0M
	10,000	63.5×100	0.20	9.80	ESME161LGC103MDA0M
	12,000	63.5×120	0.20	10.8	ESME161LGC123MDC0M
	15,000	76×100	0.20	12.7	ESME161LGC153MEA0M
	18,000	76×120	0.20	14.0	ESME161LGC183MEC0M
	22,000	76×140	0.20	16.6	ESME161LGC223MEE0M
	33,000	89×140	0.25	18.9	ESME161LGC333MFE0M
200	820	35×50	0.15	1.60	ESME201LGB821MA50M
	1,800	35×80	0.15	2.80	ESME201LGB182MA80M
	2,200	35×100	0.15	3.60	ESME201LGB222MAA0M
	2,700	35×120	0.15	4.00	ESME201LGB272MAC0M
	3,300	50×80	0.15	4.50	ESME201LGC332MC80M
	4,700	50×100	0.15	7.10	ESME201LGC472MCA0M
	5,600	50×120	0.15	8.20	ESME201LGC562MCC0M
	8,200	63.5×100	0.20	10.0	ESME201LGC822MDA0M
	10,000	63.5×120	0.20	11.0	ESME201LGC103MDC0M
	12,000	76×100	0.20	11.5	ESME201LGC123MEA0M
	15,000	76×120	0.20	12.8	ESME201LGC153MEC0M
	18,000	76×140	0.20	15.0	ESME201LGC183MEE0M
	22,000	89×140	0.25	15.6	ESME201LGC223MFE0M
250	560	35×50	0.15	1.30	ESME251LGB561MA50M
	1,200	35×80	0.15	2.30	ESME251LGB122MA80M
	1,500	35×100	0.15	3.00	ESME251LGB152MAA0M
	1,800	35×120	0.15	3.30	ESME251LGB182MAC0M
	2,200	50×80	0.15	3.70	ESME251LGC222MC80M
	3,300	50×100	0.15	5.10	ESME251LGC332MCA0M
	3,900	50×120	0.15	5.90	ESME251LGC392MCC0M
	4,700	63.5×100	0.20	6.90	ESME251LGC472MDA0M
	6,800	63.5×120	0.20	8.70	ESME251LGC682MDC0M
	10,000	76×120	0.20	11.1	ESME251LGC103MEC0M
	12,000	76×140	0.20	13.0	ESME251LGC123MEE0M
	15,000	89×140	0.20	14.9	ESME251LGC153MFE0M

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Standard screw terminals, 105℃

KMH Series

- Downsized from KME series
- Endurance with ripple current : 2,000 hours at 105℃
- **RoHS Compliant**

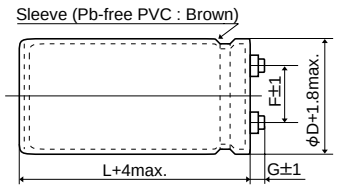


◆SPECIFICATIONS

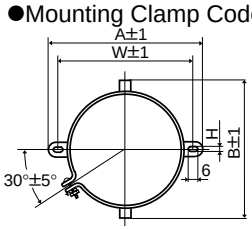
Items	Characteristics
Category Temperature Range	−40 to +105℃ (10 to 100Vdc)　−25 to +105℃ (160 to 400Vdc)
Rated Voltage Range	10 to 400Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.02CV or 5mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Shall not exceed the values shown in the STANDARD RATINGS (at 20℃, 120Hz)
Low Temperature Characteristics	Capacitance change　10 to 100Vdc : C(−40℃)/C(+20℃)≧0.6 160 to 400Vdc : C(−25℃)/C(+20℃)≧0.7 (at 120Hz)
Insulation Resistance	When measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500Vdc, the insulation resistance shall not be less than 100MΩ.
Insulation Withstanding Voltage	When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105℃. Capacitance change: ≦±20% of the initial value D.F. (tanδ): ≦200% of the initial specified value Leakage current: ≦The initial specified value
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 105℃ without voltage applied. Capacitance change: ≦±20% of the initial value D.F. (tanδ): ≦200% of the initial specified value Leakage current: ≦The initial specified value

◆DIMENSIONS (Screw-Mount) [mm]

●Terminal Code : LG

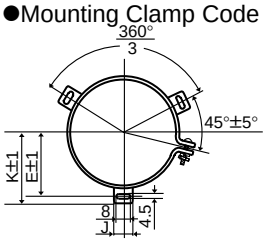


●Mounting Clamp Code : B



ϕD	A	B	W	H	F
35	58.0	44.0	48.0	3.5	12.7
50	78.0	64.0	68.0	4.5	22.4
63.5	90.0	76.0	80.0	4.5	28.0
76	104.5	90.0	93.5	4.5	31.5

●Mounting Clamp Code : C



ϕD	E	K	J	F
50	32.5	37.0	14.0	22.4
63.5	38.1	43.5	14.0	28.0
76	44.5	50.0	14.0	31.5
89	50.8	56.5	16.0	31.5

ϕ35 to ϕ63.5 : G=6
ϕ76 & ϕ89 : G=5

<Screw specifications>
Plus hexagon-headed screw:
M5×0.8×10
Maximum screw tightening torque:
3.23Nm

* The screw and the mounting clamp are separately supplied and not attached to the product.

◆PART NUMBERING SYSTEM

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
E	K	M	H				L	G					M				M

Supplement code
Size code
Capacitance tolerance code
Capacitance code (ex. 180μF:181, 1,000μF:102)
Mounting clamp code (N, B, C)
Terminal code
Voltage code (ex. 10V:100, 100V:101, 315V:3B1)
Series code
Category

Please refer to "A guide to global code (screw-mount terminal type)"

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Standard screw terminals, 105℃

KMH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
10	27,000	35×50	0.45	4.90	EKMH100LGB273MA50M
	33,000	35×50	0.50	5.10	EKMH100LGB333MA50M
	39,000	35×60	0.50	5.90	EKMH100LGB393MA60M
	47,000	35×80	0.50	7.10	EKMH100LGB473MA80M
	56,000	35×80	0.60	7.10	EKMH100LGB563MA80M
	68,000	35×100	0.60	8.50	EKMH100LGB683MAA0M
	82,000	35×100	0.65	8.90	EKMH100LGB823MAA0M
	100,000	35×120	0.65	10.7	EKMH100LGB104MAC0M
	120,000	50×80	0.75	11.0	EKMH100LGC124MC80M
	150,000	50×100	0.80	13.2	EKMH100LGC154MCA0M
	180,000	50×120	0.80	15.7	EKMH100LGC184MCC0M
	220,000	50×120	0.85	16.8	EKMH100LGC224MCC0M
	270,000	63.5×120	1.00	19.6	EKMH100LGC274MDC0M
	330,000	63.5×120	1.20	19.7	EKMH100LGC334MDC0M
	390,000	76×120	1.50	21.3	EKMH100LGC394MEC0M
	470,000	76×120	1.80	21.4	EKMH100LGC474MEC0M
	560,000	76×140	2.00	23.6	EKMH100LGC564MEE0M
	680,000	89×140	2.40	26.0	EKMH100LGC684MFE0M
16	18,000	35×50	0.40	4.20	EKMH160LGB183MA50M
	22,000	35×50	0.40	4.70	EKMH160LGB223MA50M
	27,000	35×60	0.40	5.50	EKMH160LGB273MA60M
	33,000	35×60	0.45	5.70	EKMH160LGB333MA60M
	39,000	35×80	0.45	6.80	EKMH160LGB393MA80M
	47,000	35×80	0.50	7.10	EKMH160LGB473MA80M
	56,000	35×100	0.50	8.40	EKMH160LGB563MAA0M
	68,000	35×100	0.55	8.80	EKMH160LGB683MAA0M
	82,000	50×80	0.55	10.7	EKMH160LGC823MC80M
	100,000	50×80	0.65	10.8	EKMH160LGC104MC80M
	120,000	50×100	0.65	13.1	EKMH160LGC124MCA0M
	150,000	50×120	0.70	15.3	EKMH160LGC154MCC0M
	180,000	50×120	0.80	15.7	EKMH160LGC184MCC0M
	220,000	63.5×120	0.85	19.2	EKMH160LGC224MDC0M
	270,000	63.5×120	1.00	19.6	EKMH160LGC274MDC0M
	330,000	76×120	1.30	21.1	EKMH160LGC334MEC0M
	390,000	76×120	1.50	21.3	EKMH160LGC394MEC0M
	470,000	76×140	1.60	24.2	EKMH160LGC474MEE0M
	560,000	89×140	2.00	28.1	EKMH160LGC564MFE0M
	680,000	89×140	2.40	28.5	EKMH160LGC684MFE0M
25	12,000	35×50	0.35	3.70	EKMH250LGB123MA50M
	15,000	35×50	0.35	4.10	EKMH250LGB153MA50M
	18,000	35×60	0.35	4.80	EKMH250LGB183MA60M
	22,000	35×60	0.35	5.30	EKMH250LGB223MA60M
	27,000	35×80	0.35	6.40	EKMH250LGB273MA80M
	33,000	35×80	0.40	6.70	EKMH250LGB333MA80M
	39,000	35×100	0.40	7.80	EKMH250LGB393MAA0M
	47,000	35×120	0.40	9.30	EKMH250LGB473MAC0M
	56,000	50×80	0.45	9.70	EKMH250LGC563MC80M
	68,000	50×100	0.45	11.2	EKMH250LGC683MCA0M
	82,000	50×100	0.50	11.2	EKMH250LGC823MCA0M
	100,000	50×120	0.50	14.8	EKMH250LGC104MCC0M
	120,000	63.5×100	0.65	14.9	EKMH250LGC124MDA0M
	150,000	63.5×120	0.65	17.9	EKMH250LGC154MDC0M
	180,000	63.5×120	0.80	17.9	EKMH250LGC184MDC0M
	220,000	76×120	0.85	21.3	EKMH250LGC224MEC0M
	270,000	76×120	1.00	21.7	EKMH250LGC274MEC0M
	330,000	76×140	1.20	23.4	EKMH250LGC334MEE0M
	390,000	89×140	1.50	24.9	EKMH250LGC394MFE0M
35	8,200	35×50	0.30	3.30	EKMH350LGB822MA50M
	10,000	35×50	0.30	3.60	EKMH350LGB103MA50M
	12,000	35×60	0.30	4.20	EKMH350LGB123MA60M
	15,000	35×60	0.30	4.70	EKMH350LGB153MA60M
	18,000	35×80	0.30	5.70	EKMH350LGB183MA80M
	22,000	35×80	0.30	6.30	EKMH350LGB223MA80M
	27,000	35×100	0.30	7.50	EKMH350LGB273MAA0M
	33,000	35×120	0.30	9.00	EKMH350LGB333MAC0M
	39,000	50×80	0.35	9.20	EKMH350LGC393MC80M
	47,000	50×100	0.35	11.2	EKMH350LGC473MCA0M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
35	56,000	50×100	0.40	11.4	EKMH350LGC563MCA0M
	68,000	50×120	0.40	13.6	EKMH350LGC683MCC0M
	82,000	63.5×100	0.45	14.8	EKMH350LGC823MDA0M
	100,000	63.5×120	0.45	17.6	EKMH350LGC104MDC0M
	120,000	63.5×120	0.55	17.6	EKMH350LGC124MDC0M
	150,000	76×120	0.65	19.8	EKMH350LGC154MEC0M
	180,000	76×120	0.80	19.8	EKMH350LGC184MEC0M
	220,000	76×140	0.80	23.4	EKMH350LGC224MEE0M
	270,000	89×140	1.00	25.5	EKMH350LGC274MFE0M
50	3,900	35×50	0.20	2.80	EKMH500LGB392MA50M
	4,700	35×50	0.20	3.10	EKMH500LGB472MA50M
	5,600	35×50	0.20	3.30	EKMH500LGB562MA50M
	6,800	35×50	0.25	3.30	EKMH500LGB682MA50M
	8,200	35×60	0.25	3.80	EKMH500LGB822MA60M
	10,000	35×80	0.25	4.60	EKMH500LGB103MA80M
	12,000	35×80	0.25	5.10	EKMH500LGB123MA80M
	15,000	35×80	0.25	5.70	EKMH500LGB153MA80M
	18,000	35×100	0.25	6.70	EKMH500LGB183MAA0M
	22,000	35×120	0.25	8.10	EKMH500LGB223MAC0M
	27,000	50×80	0.25	9.10	EKMH500LGC273MC80M
	33,000	50×100	0.25	11.1	EKMH500LGC333MCA0M
	39,000	50×120	0.25	13.1	EKMH500LGC393MCC0M
	47,000	50×120	0.30	13.9	EKMH500LGC473MCC0M
	56,000	63.5×100	0.35	13.9	EKMH500LGC563MDA0M
	68,000	63.5×120	0.35	16.6	EKMH500LGC683MDC0M
	82,000	76×120	0.40	18.9	EKMH500LGC823MEC0M
	100,000	76×120	0.45	19.5	EKMH500LGC104MEC0M
	120,000	76×120	0.55	19.5	EKMH500LGC124MEC0M
	150,000	89×140	0.60	23.9	EKMH500LGC154MFE0M
	180,000	89×140	0.75	23.9	EKMH500LGC184MFE0M
63	2,700	35×50	0.20	2.30	EKMH630LGB272MA50M
	3,300	35×50	0.20	2.50	EKMH630LGB332MA50M
	3,900	35×50	0.20	2.80	EKMH630LGB392MA50M
	4,700	35×50	0.20	3.10	EKMH630LGB472MA50M
	5,600	35×60	0.20	3.50	EKMH630LGB562MA60M
	6,800	35×60	0.20	3.90	EKMH630LGB682MA60M
	8,200	35×80	0.20	4.70	EKMH630LGB822MA80M
	10,000	35×80	0.25	4.70	EKMH630LGB103MA80M
	12,000	35×100	0.25	5.50	EKMH630LGB123MAA0M
	15,000	35×120	0.25	6.60	EKMH630LGB153MAC0M
	18,000	50×80	0.25	7.40	EKMH630LGC183MC80M
	22,000	50×100	0.25	9.00	EKMH630LGC223MCA0M
	27,000	50×120	0.25	10.9	EKMH630LGC273MCC0M
	33,000	50×120	0.25	12.0	EKMH630LGC333MCC0M
	39,000	63.5×100	0.30	12.5	EKMH630LGC393MDA0M
	47,000	63.5×120	0.30	14.9	EKMH630LGC473MDC0M
	56,000	63.5×120	0.30	16.3	EKMH630LGC563MDC0M
	68,000	76×120	0.35	18.4	EKMH630LGC683MEC0M
	82,000	76×140	0.40	20.0	EKMH630LGC823MEE0M
	100,000	76×140	0.50	20.0	EKMH630LGC104MEE0M
	120,000	89×140	0.60	21.8	EKMH630LGC124MFE0M
80	2,200	35×50	0.15	2.40	EKMH800LGB222MA50M
	2,700	35×50	0.15	2.70	EKMH800LGB272MA50M
	3,300	35×50	0.15	3.00	EKMH800LGB332MA50M
	3,900	35×60	0.15	3.40	EKMH800LGB392MA60M
	4,700	35×60	0.15	3.70	EKMH800LGB472MA60M
	5,600	35×80	0.15	4.50	EKMH800LGB562MA80M
	6,800	35×80	0.15	4.90	EKMH800LGB682MA80M
	8,200	35×100	0.20	5.10	EKMH800LGB822MAA0M
	10,000	35×120	0.20	6.10	EKMH800LGB103MAC0M
	12,000	50×80	0.20	6.70	EKMH800LGC123MC80M
	15,000	50×100	0.20	8.30	EKMH800LGC153MCA0M
	18,000	50×120	0.20	9.90	EKMH800LGC183MCC0M
	22,000	50×120	0.20	11.0	EKMH800LGC223MCC0M
	27,000	63.5×100	0.25	11.4	EKMH800LGC273MDA0M
	33,000	76×100	0.25	13.9	EKMH800LGC333MEA0M
	39,000	76×100	0.30	13.9	EKMH800LGC393MEA0M

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Standard screw terminals, 105℃

KMH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
80	47,000	76×120	0.30	16.5	EKMH800LGC473MEC0M
	56,000	76×120	0.30	18.1	EKMH800LGC563MEC0M
	68,000	76×140	0.35	19.7	EKMH800LGC683MEE0M
	82,000	89×140	0.40	22.1	EKMH800LGC823MFE0M
100	1,800	35×50	0.10	2.70	EKMH101LGB182MA50M
	2,200	35×50	0.10	3.00	EKMH101LGB222MA50M
	2,700	35×60	0.10	3.50	EKMH101LGB272MA60M
	3,300	35×80	0.10	4.20	EKMH101LGB332MA80M
	3,900	35×80	0.12	4.20	EKMH101LGB392MA80M
	4,700	35×100	0.12	5.00	EKMH101LGB472MAA0M
	5,600	35×100	0.12	5.40	EKMH101LGB562MAA0M
	6,800	35×120	0.15	5.80	EKMH101LGB682MAC0M
	8,200	50×80	0.15	6.40	EKMH101LGC822MC80M
	10,000	50×100	0.15	7.80	EKMH101LGC103MCA0M
	12,000	50×120	0.15	9.30	EKMH101LGC123MCC0M
	15,000	50×120	0.15	10.4	EKMH101LGC153MCC0M
	18,000	63.5×100	0.20	10.4	EKMH101LGC183MDA0M
	22,000	63.5×120	0.20	12.5	EKMH101LGC223MDC0M
	27,000	76×120	0.25	13.7	EKMH101LGC273MEC0M
	33,000	76×120	0.25	15.2	EKMH101LGC333MEC0M
	39,000	76×140	0.30	16.1	EKMH101LGC393MEE0M
	47,000	89×140	0.30	19.3	EKMH101LGC473MFE0M
	56,000	89×140	0.30	21.1	EKMH101LGC563MFE0M
160	560	35×50	0.15	1.20	EKMH161LGB561MA50M
	680	35×50	0.15	1.30	EKMH161LGB681MA50M
	820	35×50	0.15	1.40	EKMH161LGB821MA50M
	1,000	35×50	0.15	1.60	EKMH161LGB102MA50M
	1,200	35×60	0.15	1.90	EKMH161LGB122MA60M
	1,500	35×60	0.15	2.10	EKMH161LGB152MA60M
	1,800	35×80	0.15	2.50	EKMH161LGB182MA80M
	2,200	35×80	0.15	2.80	EKMH161LGB222MA80M
	2,700	35×100	0.15	3.30	EKMH161LGB272MAA0M
	3,300	35×120	0.15	3.80	EKMH161LGB332MAC0M
	3,900	50×80	0.20	3.80	EKMH161LGC392MC80M
	4,700	50×100	0.20	4.60	EKMH161LGC472MCA0M
	5,600	50×100	0.20	5.10	EKMH161LGC562MCA0M
	6,800	50×120	0.20	6.10	EKMH161LGC682MCC0M
	8,200	63.5×100	0.20	7.00	EKMH161LGC822MDA0M
	10,000	63.5×120	0.20	8.40	EKMH161LGC103MDC0M
	12,000	76×100	0.20	9.40	EKMH161LGC123MEA0M
	15,000	76×120	0.20	11.4	EKMH161LGC153MEC0M
	18,000	76×140	0.20	13.4	EKMH161LGC183MEE0M
	22,000	89×140	0.25	14.5	EKMH161LGC223MFE0M
	27,000	89×140	0.25	16.0	EKMH161LGC273MFE0M
200	330	35×50	0.15	0.90	EKMH201LGB331MA50M
	390	35×50	0.15	1.00	EKMH201LGB391MA50M
	470	35×50	0.15	1.10	EKMH201LGB471MA50M
	560	35×50	0.15	1.20	EKMH201LGB561MA50M
	680	35×50	0.15	1.30	EKMH201LGB681MA50M
	820	35×50	0.15	1.40	EKMH201LGB821MA50M
	1,000	35×60	0.15	1.70	EKMH201LGB102MA60M
	1,200	35×60	0.15	1.90	EKMH201LGB122MA60M
	1,500	35×80	0.15	2.30	EKMH201LGB152MA80M
	1,800	35×80	0.15	2.50	EKMH201LGB182MA80M
	2,200	35×100	0.15	3.00	EKMH201LGB222MAA0M
	2,700	35×120	0.15	3.60	EKMH201LGB272MAC0M
	3,300	50×80	0.15	4.10	EKMH201LGC332MC80M
	3,900	50×100	0.15	4.90	EKMH201LGC392MCA0M
	4,700	63.5×100	0.20	5.30	EKMH201LGC472MDA0M
	5,600	63.5×100	0.20	5.80	EKMH201LGC562MDA0M
	6,800	63.5×120	0.20	6.90	EKMH201LGC682MDC0M
	8,200	63.5×120	0.20	7.60	EKMH201LGC822MDC0M
	10,000	76×120	0.20	9.30	EKMH201LGC103MEC0M
	12,000	76×120	0.20	10.2	EKMH201LGC123MEC0M
	15,000	76×140	0.20	12.2	EKMH201LGC153MEE0M
	18,000	89×140	0.25	13.1	EKMH201LGC183MFE0M
250	270	35×50	0.15	0.80	EKMH251LGB271MA50M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
250	330	35×50	0.15	0.90	EKMH251LGB331MA50M
	390	35×50	0.15	1.00	EKMH251LGB391MA50M
	470	35×50	0.15	1.10	EKMH251LGB471MA50M
	560	35×50	0.15	1.20	EKMH251LGB561MA50M
	680	35×60	0.15	1.40	EKMH251LGB681MA60M
	820	35×80	0.15	1.60	EKMH251LGB821MA80M
	1,000	35×80	0.20	1.60	EKMH251LGB102MA80M
	1,200	35×80	0.20	1.80	EKMH251LGB122MA80M
	1,500	35×100	0.20	2.10	EKMH251LGB152MAA0M
	1,800	35×120	0.20	2.50	EKMH251LGB182MAC0M
	2,200	50×80	0.20	2.90	EKMH251LGC222MC80M
	2,700	50×100	0.20	3.50	EKMH251LGC272MCA0M
	3,300	50×120	0.20	4.20	EKMH251LGC332MCC0M
	3,900	50×120	0.20	4.60	EKMH251LGC392MCC0M
	4,700	63.5×120	0.20	5.70	EKMH251LGC472MDC0M
	5,600	63.5×120	0.20	6.30	EKMH251LGC562MDC0M
	6,800	76×120	0.20	7.70	EKMH251LGC682MEC0M
	8,200	76×120	0.20	8.40	EKMH251LGC822MEC0M
	10,000	76×140	0.20	10.0	EKMH251LGC103MEE0M
	12,000	89×140	0.20	11.9	EKMH251LGC123MFE0M
315	180	35×50	0.10	0.80	EKMH3B1LGB181MA50M
	220	35×50	0.10	0.90	EKMH3B1LGB221MA50M
	270	35×50	0.10	1.00	EKMH3B1LGB271MA50M
	330	35×50	0.10	1.10	EKMH3B1LGB331MA50M
	390	35×50	0.10	1.20	EKMH3B1LGB391MA50M
	470	35×60	0.10	1.40	EKMH3B1LGB471MA60M
	560	35×60	0.10	1.50	EKMH3B1LGB561MA60M
	680	35×80	0.10	1.70	EKMH3B1LGB681MA80M
	820	35×80	0.15	1.70	EKMH3B1LGB821MA80M
	1,000	35×100	0.15	2.00	EKMH3B1LGB102MAA0M
	1,200	35×120	0.15	2.40	EKMH3B1LGB122MAC0M
	1,500	50×80	0.15	2.70	EKMH3B1LGC152MC80M
	1,800	50×100	0.15	3.30	EKMH3B1LGC182MCA0M
	2,200	50×120	0.15	4.00	EKMH3B1LGC222MCC0M
	2,700	50×120	0.15	4.40	EKMH3B1LGC272MCC0M
	3,300	63.5×100	0.15	5.10	EKMH3B1LGC332MDA0M
	3,900	63.5×120	0.15	6.00	EKMH3B1LGC392MDC0M
	4,700	76×100	0.15	6.80	EKMH3B1LGC472MEA0M
	5,600	76×120	0.15	8.00	EKMH3B1LGC562MEC0M
	6,800	76×130	0.15	9.20	EKMH3B1LGC682MED0M
	8,200	89×140	0.15	11.4	EKMH3B1LGC822MFE0M
	10,000	89×140	0.15	12.6	EKMH3B1LGC103MFE0M
350	180	35×50	0.10	0.80	EKMH351LGB181MA50M
	220	35×50	0.10	0.90	EKMH351LGB221MA50M
	270	35×50	0.10	1.00	EKMH351LGB271MA50M
	330	35×50	0.10	1.10	EKMH351LGB331MA50M
	390	35×60	0.10	1.30	EKMH351LGB391MA60M
	470	35×60	0.10	1.40	EKMH351LGB471MA60M
	560	35×80	0.10	1.60	EKMH351LGB561MA80M
	680	35×80	0.15	1.60	EKMH351LGB681MA80M
	820	35×100	0.15	1.80	EKMH351LGB821MAA0M
	1,000	35×120	0.15	2.20	EKMH351LGB102MAC0M
	1,200	50×80	0.15	2.40	EKMH351LGC122MC80M
	1,500	50×100	0.15	3.00	EKMH351LGC152MCA0M
	1,800	50×120	0.15	3.60	EKMH351LGC182MCC0M
	2,200	50×120	0.15	4.00	EKMH351LGC222MCC0M
	2,700	63.5×100	0.15	4.60	EKMH351LGC272MDA0M
	3,900	76×120	0.15	6.70	EKMH351LGC392MEC0M
	5,600	76×130	0.15	8.30	EKMH351LGC562MED0M
	6,800	76×140	0.15	9.50	EKMH351LGC682MEE0M
	8,200	89×140	0.15	11.4	EKMH351LGC822MFE0M
400	180	35×50	0.10	0.80	EKMH401LGB181MA50M
	220	35×50	0.10	0.90	EKMH401LGB221MA50M
	270	35×50	0.10	1.00	EKMH401LGB271MA50M
	330	35×60	0.10	1.20	EKMH401LGB331MA60M
	390	35×60	0.10	1.30	EKMH401LGB391MA60M
	470	35×80	0.10	1.40	EKMH401LGB471MA80M

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Standard screw terminals, 105℃

KMH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
400	560	35×80	0.15	1.40	EKMH401LGB561MA80M
	680	35×100	0.15	1.70	EKMH401LGB681MAA0M
	820	35×120	0.15	2.00	EKMH401LGB821MAC0M
	1,000	50×80	0.15	2.20	EKMH401LGC102MC80M
	1,200	50×100	0.15	2.70	EKMH401LGC122MCA0M
	1,500	50×120	0.15	3.30	EKMH401LGC152MCC0M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
400	2,200	63.5×100	0.15	4.20	EKMH401LGC222MDA0M
	3,300	63.5×120	0.15	5.50	EKMH401LGC332MDC0M
	4,700	76×130	0.15	7.60	EKMH401LGC472MED0M
	5,600	89×140	0.15	9.40	EKMH401LGC562MFE0M
	6,800	89×140	0.15	10.4	EKMH401LGC682MFE0M

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Rated voltage (Vdc)	Case diameter (mm)	Frequency (Hz)					
		50	120	300	1k	10k	50k
10 to 50	φ35 to φ89	0.95	1.00	1.03	1.05	1.09	1.12
63 & 80	φ35	0.90	1.00	1.06	1.10	1.18	1.22
	φ50 to φ89	0.95	1.00	1.03	1.05	1.09	1.12
100	φ35	0.82	1.00	1.12	1.22	1.30	1.33
	φ50	0.90	1.00	1.06	1.10	1.18	1.22
	φ63.5 to φ89	0.95	1.00	1.03	1.05	1.09	1.12
160 to 250	φ35	0.80	1.00	1.19	1.34	1.46	1.52
	φ50 & φ63.5	0.81	1.00	1.14	1.26	1.36	1.41
	φ76 & φ89	0.82	1.00	1.12	1.22	1.30	1.33
315 to 400	φ35 to φ89	0.80	1.00	1.19	1.34	1.46	1.52

The endurance of capacitors is shorted with internal heating produced by ripple current at the rate of halving the lifetime with every 5℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

New!

RWG Series

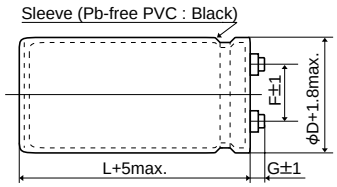
- Downsize, high ripple version of RWF series
- 20% up ripple current at 300Hz than RWF series
- Endurance with ripple current : 5,000 hours at 85℃
- **RoHS Compliant**

◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−25 to +85℃
Rated Voltage Range	350 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.02CV or 5mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	0.25 max. (at 20℃, 120Hz)
Low Temperature Characteristics	Capacitance change C(−25℃)/C(+20℃)≧0.7 (at 120Hz)
Insulation Resistance	When measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500Vdc, the insulation resistance shall not be less than 100MΩ.
Insulation Withstanding Voltage	When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85℃.
	Capacitance change: ≦±20% of the initial value
	D.F. (tanδ): ≦200% of the initial specified value
	Leakage current: ≦The initial specified value
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 85℃ without voltage applied.
	Capacitance change: ≦±20% of the initial value
	D.F. (tanδ): ≦200% of the initial specified value
	Leakage current: ≦The initial specified value

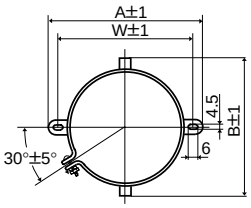
◆DIMENSIONS (Screw-Mount) [mm]

●Terminal Code : LG



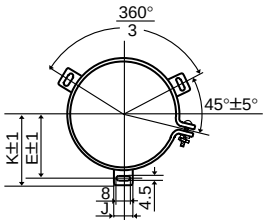
ϕ50 : G=6
ϕ63.5, ϕ76 : G=5
ϕ89 : G=4

●Mounting Clamp Code : B



ϕD	A	B	W	F
50	78.0	64.0	68.0	22.4
63.5	90.0	76.0	80.0	28.0
76	104.5	90.0	93.5	31.5

●Mounting Clamp Code : C



ϕD	E	K	F	J
50	32.5	37.0	22.4	14.0
63.5	38.1	43.5	28.0	14.0
76	44.5	50.0	31.5	14.0
89	50.8	56.5	31.5	16.0

<Screw specifications>
ϕ50 to ϕ89
Plus hexagon-headed screw : M5×0.8×10
Maximum screw tightening torque : 3.23Nm

* The screw and the mounting clamp are separately supplied and not attached to the product.

◆PART NUMBERING SYSTEM

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
E	R	W	G				L	G					M				M

Supplement code
Size code
Capacitance tolerance code
Capacitance code (ex. 6,800μF:682, 12,000μF:123)
Mounting clamp code (N, B, C)
Terminal code
Voltage code (ex. 350V:351, 400V:401)
Series code
Category

Please refer to "A guide to global code (screw-mount terminal type)"

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

New!

RWG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/85℃) 120Hz	Rated ripple current (Arms/85℃) 300Hz	Part No.
350	2,200	50×96	0.25	7.70	9.20	ERWG351LGC222MC96M
	2,700	50×105	0.25	8.90	10.6	ERWG351LGC272MCA5M
	3,300	50×115	0.25	10.3	12.3	ERWG351LGC332MCB5M
	3,900	50×130	0.25	11.8	14.1	ERWG351LGC392MCD0M
	4,700	63.5×115	0.25	13.6	16.3	ERWG351LGC472MDB5M
	5,600	63.5×130	0.25	15.7	18.8	ERWG351LGC562MDD0M
	6,800	63.5×155	0.25	18.8	22.5	ERWG351LGC682MDF5M
	6,800	76×115	0.25	18.2	21.8	ERWG351LGC682MEB5M
	8,200	63.5×190	0.25	22.6	27.1	ERWG351LGC822MDK0M
	8,200	76×130	0.25	21.0	25.2	ERWG351LGC822MED0M
	10,000	76×155	0.25	25.1	30.1	ERWG351LGC103MEF5M
	12,000	76×170	0.25	28.7	34.4	ERWG351LGC123MEH0M
	15,000	89×155	0.25	33.6	40.3	ERWG351LGC153MFF5M
	15,000	89×170	0.25	35.0	42.0	ERWG351LGC153MFH0M
	18,000	89×190	0.25	40.3	48.3	ERWG351LGC183MFK0M
400	1,800	50×96	0.25	7.00	8.40	ERWG401LGC182MC96M
	2,200	50×105	0.25	8.10	9.70	ERWG401LGC222MCA5M
	2,700	50×115	0.25	9.30	11.1	ERWG401LGC272MCB5M
	3,300	50×130	0.25	10.9	13.0	ERWG401LGC332MCD0M
	3,900	63.5×115	0.25	12.4	14.8	ERWG401LGC392MDB5M
	4,700	63.5×130	0.25	14.4	17.2	ERWG401LGC472MDD0M
	5,600	63.5×155	0.25	17.0	20.4	ERWG401LGC562MDF5M
	5,600	76×115	0.25	16.5	19.8	ERWG401LGC562MEB5M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/85℃) 120Hz	Rated ripple current (Arms/85℃) 300Hz	Part No.
400	6,800	63.5×190	0.25	20.6	24.7	ERWG401LGC682MDK0M
	6,800	76×130	0.25	19.2	23.0	ERWG401LGC682MED0M
	8,200	76×155	0.25	22.7	27.2	ERWG401LGC822MEF5M
	10,000	76×170	0.25	26.2	31.4	ERWG401LGC103MEH0M
	12,000	89×155	0.25	30.0	36.0	ERWG401LGC123MFF5M
	12,000	89×170	0.25	31.3	37.5	ERWG401LGC123MFH0M
	15,000	89×190	0.25	36.7	44.0	ERWG401LGC153MFK0M
450	1,500	50×96	0.25	6.40	7.60	ERWG451LGC152MC96M
	1,800	50×105	0.25	7.30	8.70	ERWG451LGC182MCA5M
	2,200	50×115	0.25	8.40	10.0	ERWG451LGC222MCB5M
	2,700	50×130	0.25	9.80	11.7	ERWG451LGC272MCD0M
	3,300	63.5×115	0.25	11.4	13.6	ERWG451LGC332MDB5M
	3,900	63.5×130	0.25	13.1	15.7	ERWG451LGC392MDD0M
	4,700	63.5×155	0.25	15.6	18.7	ERWG451LGC472MDF5M
	4,700	76×115	0.25	15.1	18.1	ERWG451LGC472MEB5M
	5,600	63.5×190	0.25	18.7	22.4	ERWG451LGC562MDK0M
	5,600	76×130	0.25	17.4	20.8	ERWG451LGC562MED0M
	6,800	76×155	0.25	20.7	24.8	ERWG451LGC682MEF5M
	8,200	76×170	0.25	23.7	28.4	ERWG451LGC822MEH0M
	10,000	89×155	0.25	27.4	32.8	ERWG451LGC103MFF5M
	10,000	89×170	0.25	28.6	34.3	ERWG451LGC103MFH0M
	12,000	89×190	0.25	32.9	39.4	ERWG451LGC123MFK0M

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency (Hz)	50	120	300	1k	3k
Coefficient	0.8	1.0	1.2	1.4	1.5

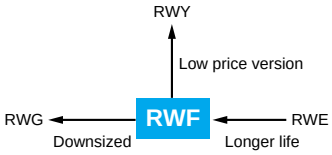
Note : The endurancce of capacitors is shorted with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for the RWG series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For the details, please contact a representative of Nippon Chemi-Con.

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

RWF Series

- ●High ripple capability
- ●Endurance with ripple current : 5,000 hours at 85℃
- ●Wide variety case sizes from ϕ50 to ϕ100
- ●**RoHS Compliant**

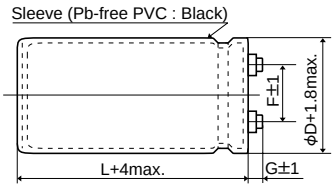


◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−25 to +85℃
Rated Voltage Range	350 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.02CV or 5mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	0.25 max. (at 20℃, 120Hz)
Low Temperature Characteristics	Capacitance change C(−25℃)/C(+20℃)≧0.7 (at 120Hz)
Insulation Resistance	When measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500Vdc, the insulation resistance shall not be less than 100MΩ.
Insulation Withstanding Voltage	When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85℃.
	Capacitance change: ≦±20% of the initial value
	D.F. (tanδ): ≦200% of the initial specified value
	Leakage current: ≦The initial specified value
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 85℃ without voltage applied.
	Capacitance change: ≦±20% of the initial value
	D.F. (tanδ): ≦200% of the initial specified value
	Leakage current: ≦The initial specified value

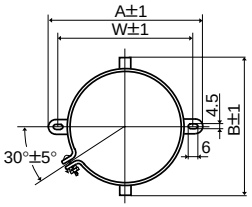
◆DIMENSIONS (Screw-Mount) [mm]

●Terminal Code : LG



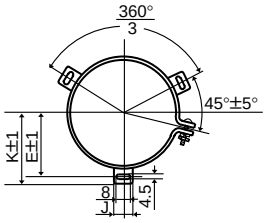
ϕ50 & ϕ63.5 : G=6
ϕ76 & ϕ89 : G=5
ϕ100 : G=10

●Mounting Clamp Code : B



ϕD	A	B	W	F
50	78.0	64.0	68.0	22.4
63.5	90.0	76.0	80.0	28.0
76	104.5	90.0	93.5	31.5

●Mounting Clamp Code : C



ϕD	E	K	F	J
50	32.5	37.0	22.4	14.0
63.5	38.1	43.5	28.0	14.0
76	44.5	50.0	31.5	14.0
89	50.8	56.5	31.5	16.0
100	56.5	63.4	41.5	18.0

<Screw specifications>
ϕ50 to ϕ89
Plus hexagon-headed screw : M5×0.8×10
Maximum screw tightening torque : 3.23Nm
ϕ100
Cross-recessed head (Phillips) screw : M8×1.25×16
Spring washer
Washer
Maximum screw tightening torque : 6.31Nm

* The screw and the mounting clamp are separately supplied and not attached to the product.

◆PART NUMBERING SYSTEM

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
E	R	W	F	□	□	□	L	G	□	□	□	□	M	□	□	□	M

- 18 Supplement code
- 15–17 Size code
- 14 Capacitance tolerance code
- 11–13 Capacitance code (ex. 6,800μF:682, 12,000μF:123)
- 10 Mounting clamp code (N, B, C)
- 8–9 Terminal code
- 5–7 Voltage code (ex. 350V:351, 400V:401)
- 4 Series code
- 1 Category

Please refer to "A guide to global code (screw-mount terminal type)"

CAT. No. E1001G

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

RWF Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
350	1,200	50×60	0.25	4.90	ERWF351LGC122MC60M
	1,800	50×75	0.25	6.50	ERWF351LGC182MC75M
	2,200	50×85	0.25	7.50	ERWF351LGC222MC85M
	2,200	50×96	0.25	7.70	ERWF351LGC222MC96M
	2,700	50×115	0.25	9.30	ERWF351LGC272MCB5M
	3,300	50×130	0.25	10.8	ERWF351LGC332MCD0M
	3,900	63.5×115	0.25	12.1	ERWF351LGC392MDB5M
	4,700	63.5×130	0.25	14.0	ERWF351LGC472MDD0M
	5,600	63.5×155	0.25	16.6	ERWF351LGC562MDF5M
	5,600	76×115	0.25	16.1	ERWF351LGC562MEB5M
	6,800	63.5×190	0.25	20.0	ERWF351LGC682MDK0M
	6,800	76×130	0.25	18.6	ERWF351LGC682MED0M
	8,200	76×155	0.25	22.2	ERWF351LGC822MEF5M
	10,000	76×170	0.25	25.2	ERWF351LGC103MEH0M
	12,000	89×155	0.25	29.1	ERWF351LGC123MFF5M
	15,000	89×190	0.25	35.7	ERWF351LGC153MFK0M
	18,000	100×190	0.25	36.9	ERWF351LGC183MGK0M
	22,000	100×250	0.25	46.1	ERWF351LGC223MGR0M
400	1,000	50×60	0.25	4.40	ERWF401LGC102MC60M
	1,500	50×75	0.25	5.90	ERWF401LGC152MC75M
	1,800	50×85	0.25	6.80	ERWF401LGC182MC85M
	1,800	50×96	0.25	7.00	ERWF401LGC182MC96M
	2,200	50×105	0.25	8.00	ERWF401LGC222MCA5M
	2,700	50×130	0.25	9.80	ERWF401LGC272MCD0M
	3,300	63.5×115	0.25	11.1	ERWF401LGC332MDB5M
	3,900	63.5×130	0.25	12.7	ERWF401LGC392MDD0M
	4,700	63.5×155	0.25	15.2	ERWF401LGC472MDF5M
	4,700	76×115	0.25	14.7	ERWF401LGC472MEB5M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
400	5,600	63.5×190	0.25	18.2	ERWF401LGC562MDK0M
	5,600	76×130	0.25	16.9	ERWF401LGC562MED0M
	6,800	76×155	0.25	20.2	ERWF401LGC682MEF5M
	8,200	76×170	0.25	22.8	ERWF401LGC822MEH0M
	10,000	89×155	0.25	26.6	ERWF401LGC103MFF5M
	12,000	89×170	0.25	30.0	ERWF401LGC123MFH0M
	15,000	100×190	0.25	33.7	ERWF401LGC153MGK0M
	18,000	100×220	0.25	37.4	ERWF401LGC183MGN0M
450	820	50×60	0.25	4.00	ERWF451LGC821MC60M
	1,000	50×75	0.25	4.80	ERWF451LGC102MC75M
	1,200	50×85	0.25	5.60	ERWF451LGC122MC85M
	1,200	50×96	0.25	5.70	ERWF451LGC122MC96M
	1,500	50×96	0.25	6.30	ERWF451LGC152MC96M
	1,800	50×115	0.25	7.60	ERWF451LGC182MCB5M
	2,200	50×130	0.25	8.80	ERWF451LGC222MCD0M
	2,700	63.5×115	0.25	10.1	ERWF451LGC272MDB5M
	3,300	63.5×130	0.25	11.7	ERWF451LGC332MDD0M
	3,900	63.5×155	0.25	13.8	ERWF451LGC392MDF5M
	3,900	76×115	0.25	13.4	ERWF451LGC392MEB5M
	4,700	63.5×190	0.25	16.7	ERWF451LGC472MDK0M
	4,700	76×130	0.25	15.5	ERWF451LGC472MED0M
	5,600	76×155	0.25	18.3	ERWF451LGC562MEF5M
	6,800	76×170	0.25	20.7	ERWF451LGC682MEH0M
	8,200	89×155	0.25	24.1	ERWF451LGC822MFF5M
	10,000	89×170	0.25	27.8	ERWF451LGC103MFH0M
	12,000	100×190	0.25	29.3	ERWF451LGC123MGK0M
	15,000	100×250	0.25	37.0	ERWF451LGC153MGR0M

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency (Hz)	50	120	300	1k	3k
Coefficient	0.8	1.0	1.1	1.3	1.4

Note : The endurancce of capacitors is shorted with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for the RWF series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For the details, please contact a representative of Nippon Chemi-Con.

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

RWE Series

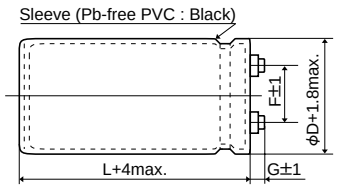
- Rated voltage range : 350 to 550Vdc
- Endurance with ripple current : 85℃ 2,000 hours
- **RoHS Compliant**

◆SPECIFICATIONS

Items	Characteristics				
Category Temperature Range	−25 to +85℃				
Rated Voltage Range	350 to 550Vdc				
Capacitance Tolerance	±20% (M)				(at 20℃, 120Hz)
Leakage Current	I=0.02CV or 5mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)				(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	0.25 max.				(at 20℃, 120Hz)
Low Temperature Characteristics	Capacitance change	Rated Voltage (Vdc)	350 to 450V	500 & 550V	(at 120Hz)
		C(−25℃)/C(+20℃)	≧0.7	≧0.6	
Insulation Resistance	When measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500Vdc, the insulation resistance shall not be less than 100MΩ.				
Insulation Withstanding Voltage	When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.				
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 85℃.				
	Capacitance change	≦±20% of the initial value			
	D.F. (tanδ)	≦300% of the initial specified value			
	Leakage current	≦The initial specified value			
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 85℃ without voltage applied.				
	Capacitance change	≦±20% of the initial value			
	D.F. (tanδ)	≦300% of the initial specified value			
	Leakage current	≦The initial specified value			

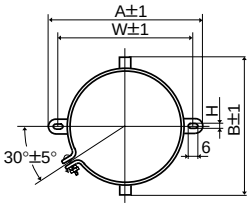
◆DIMENSIONS (Screw-Mount) [mm]

●Terminal Code : LG



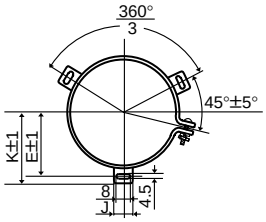
φ35 to φ63.5 : G=6
φ76 & φ89 : G=5

●Mounting Clamp Code : B



φD	A	B	W	H	F
35	58.0	44.0	48.0	3.5	12.7
50	78.0	64.0	68.0	4.5	22.4
63.5	90.0	76.0	80.0	4.5	28.0
76	104.5	90.0	93.5	4.5	31.5

●Mounting Clamp Code : C



φD	E	K	F	J
50	32.5	37.0	22.4	14.0
63.5	38.1	43.5	28.0	14.0
76	44.5	50.0	31.5	14.0
89	50.8	56.5	31.5	16.0

<Screw specifications>
Plus hexagon-headed screw:
M5×0.8×10
Maximum screw tightening torque:
3.23Nm

* The screw and the mounting clamp are separately supplied and not attached to the product.

◆PART NUMBERING SYSTEM

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
E	R	W	E				L	G					M				M

Supplement code
Size code
Capacitance tolerance code
Capacitance code (ex. 680μF:681, 6,800μF:682)
Mounting clamp code (N, B, C)
Terminal code
Voltage code (ex. 350V:351, 500V:501)
Series code
Category

Please refer to "A guide to global code (screw-mount terminal type)"

CAT. No. E1001G

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

RWE Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
350	390	35×50	0.25	1.90	ERWE351LGB391MA50M
	680	35×80	0.25	2.90	ERWE351LGB681MA80M
	1,000	35×100	0.25	3.80	ERWE351LGB102MAA0M
	1,200	35×120	0.25	4.20	ERWE351LGB122MAC0M
	1,500	50×75	0.25	4.70	ERWE351LGC152MC75M
	2,200	50×96	0.25	6.30	ERWE351LGC222MC96M
	3,300	50×130	0.25	8.80	ERWE351LGC332MCD0M
	3,300	63.5×96	0.25	8.80	ERWE351LGC332MD96M
	3,900	63.5×115	0.25	10.3	ERWE351LGC392MDB5M
	4,700	63.5×130	0.25	12.0	ERWE351LGC472MDD0M
	4,700	76×96	0.25	11.7	ERWE351LGC472ME96M
	5,600	76×115	0.25	12.6	ERWE351LGC562MEB5M
	6,800	76×130	0.25	15.9	ERWE351LGC682MED0M
	8,200	76×155	0.25	19.0	ERWE351LGC822MEF5M
	12,000	89×155	0.25	22.5	ERWE351LGC123MFF5M
400	330	35×50	0.25	1.70	ERWE401LGB331MA50M
	560	35×80	0.25	2.70	ERWE401LGB561MA80M
	820	35×100	0.25	3.40	ERWE401LGB821MAA0M
	1,000	35×120	0.25	3.90	ERWE401LGB102MAC0M
	1,200	50×75	0.25	4.20	ERWE401LGC122MC75M
	1,800	50×96	0.25	5.70	ERWE401LGC182MC96M
	2,200	50×130	0.25	7.20	ERWE401LGC222MCD0M
	2,700	63.5×96	0.25	7.90	ERWE401LGC272MD96M
	3,300	63.5×115	0.25	9.50	ERWE401LGC332MDB5M
	3,900	63.5×130	0.25	10.9	ERWE401LGC392MDD0M
	3,900	76×96	0.25	10.6	ERWE401LGC392ME96M
	4,700	76×115	0.25	12.6	ERWE401LGC472MEB5M
	5,600	76×130	0.25	14.5	ERWE401LGC562MED0M
	6,800	76×155	0.25	17.3	ERWE401LGC682MEF5M
	10,000	89×155	0.25	20.5	ERWE401LGC103MFF5M
450	270	35×50	0.25	1.60	ERWE451LGB271MA50M
	470	35×80	0.25	2.40	ERWE451LGB471MA80M
	680	35×100	0.25	3.10	ERWE451LGB681MAA0M
	820	35×120	0.25	3.50	ERWE451LGB821MAC0M
	1,000	50×75	0.25	3.90	ERWE451LGC102MC75M
	1,200	50×96	0.25	4.70	ERWE451LGC122MC96M
	1,500	50×115	0.25	5.60	ERWE451LGC152MCB5M
	1,800	50×130	0.25	6.50	ERWE451LGC182MCD0M
	2,200	63.5×96	0.25	7.20	ERWE451LGC222MD96M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
450	2,700	63.5×115	0.25	8.60	ERWE451LGC272MDB5M
	3,300	63.5×130	0.25	10.0	ERWE451LGC332MDD0M
	3,300	76×96	0.25	9.80	ERWE451LGC332ME96M
	3,900	76×115	0.25	11.5	ERWE451LGC392MEB5M
	4,700	76×130	0.25	13.3	ERWE451LGC472MED0M
	5,600	76×155	0.25	15.7	ERWE451LGC562MEF5M
	8,200	89×155	0.25	18.6	ERWE451LGC822MFF5M
500	120	35×50	0.25	0.70	ERWE501LGB121MA50M
	270	35×80	0.25	1.20	ERWE501LGB271MA80M
	330	35×100	0.25	1.40	ERWE501LGB331MAA0M
	390	35×120	0.25	1.70	ERWE501LGB391MAC0M
	470	50×75	0.25	1.80	ERWE501LGC471MC75M
	680	50×96	0.25	2.50	ERWE501LGC681MC96M
	820	50×115	0.25	2.90	ERWE501LGC821MCB5M
	1,000	50×130	0.25	3.40	ERWE501LGC102MCD0M
	1,000	63.5×96	0.25	3.40	ERWE501LGC102MD96M
	1,500	63.5×115	0.25	4.50	ERWE501LGC152MDB5M
	1,500	76×96	0.25	4.60	ERWE501LGC152ME96M
	1,800	63.5×130	0.25	5.20	ERWE501LGC182MDD0M
	2,200	76×115	0.25	6.10	ERWE501LGC222MEB5M
	2,700	76×155	0.25	7.70	ERWE501LGC272MEF5M
	3,900	89×155	0.25	10.1	ERWE501LGC392MFF5M
550	100	35×50	0.25	0.60	ERWE551LGB101MA50M
	180	35×80	0.25	1.00	ERWE551LGB181MA80M
	270	35×100	0.25	1.30	ERWE551LGB271MAA0M
	330	35×120	0.25	1.60	ERWE551LGB331MAC0M
	390	50×75	0.25	1.70	ERWE551LGC391MC75M
	560	50×96	0.25	2.10	ERWE551LGC561MC96M
	560	63.5×96	0.25	2.50	ERWE551LGC561MD96M
	680	50×115	0.25	2.70	ERWE551LGC681MCB5M
	680	63.5×115	0.25	3.00	ERWE551LGC681MDB5M
	820	50×130	0.25	3.10	ERWE551LGC821MCD0M
	820	63.5×130	0.25	3.50	ERWE551LGC821MDD0M
	1,200	76×96	0.25	4.20	ERWE551LGC122ME96M
	1,500	76×115	0.25	5.00	ERWE551LGC152MEB5M
	1,800	76×130	0.25	5.80	ERWE551LGC182MED0M
	2,200	76×155	0.25	7.00	ERWE551LGC222MEF5M
	3,300	89×155	0.25	9.30	ERWE551LGC332MFF5M

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency (Hz)	50	120	300	1k	3k
Coefficient	0.8	1.0	1.1	1.3	1.4

Note : The endurance of capacitors is shorted with internal heating produced by ripple current at the rate of halving the lifetime with every 5 to 10℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for the RWE series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For the details, please contact a representative of Nippon Chemi-Con.

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

RWY Series

- ●High ripple capability
- ●Endurance with ripple current : 5,000 hours at 85℃
- ●Cost-down design for three-phase input inverters
- ●**RoHS Compliant**

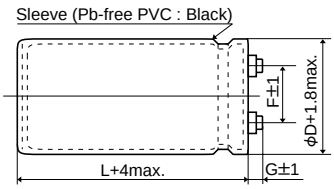
RWY
↑ Low price version
RWF

◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−25 to +85℃
Rated Voltage Range	350 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.02CV or 5mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	0.12 max. (at 20℃, 120Hz)
Low Temperature Characteristics	Capacitance change C(−25℃)/C(+20℃)≧0.7 (at 120Hz)
Insulation Resistance	When it is measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500Vdc, the insulation resistance shall not be less than 100MΩ.
Insulation Withstanding Voltage	When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85℃.
	Capacitance change ≦±20% of the initial value
	D.F. (tanδ) ≦200% of the initial specified value
	Leakage current ≦The initial specified value
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied.
	Capacitance change ≦±20% of the initial value
	D.F. (tanδ) ≦200% of the initial specified value
	Leakage current ≦The initial specified value

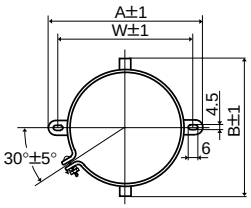
◆DIMENSIONS (Screw-Mount) [mm]

●Terminal Code : LG



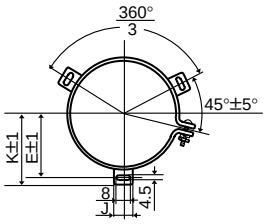
φ50 to φ76 : G=6
φ89 : G=4
φ100 : G=10

●Mounting Clamp Code : B



φD	A	B	W	F
50	78.0	64.0	68.0	22.4
63.5	90.0	76.0	80.0	28.0
76	104.5	90.0	93.5	31.5

●Mounting Clamp Code : C

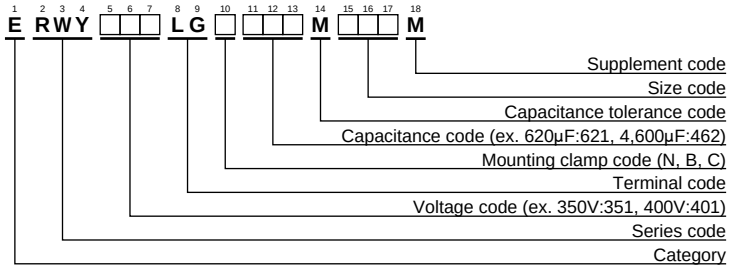


φD	E	K	F	J
50	32.5	37.0	22.4	14.0
63.5	38.1	43.5	28.0	14.0
76	44.5	50.0	31.5	14.0
89	50.8	56.5	31.5	16.0
100	56.5	63.4	41.5	18.0

<Screw specifications>
φ50 to φ89
Plus hexagon-headed screw : M5×0.8×10
Maximum screw tightening torque : 3.23Nm
φ100
Cross-recessed head (Phillips) screw : M8×1.25×16
Spring washer
Washer
Maximum screw tightening torque : 6.31Nm

* The screw and the mounting clamp are separately supplied and not attached to the product.

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (screw-mount terminal type)"

CAT. No. E1001G

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

RWY Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,300Hz)	Part No.
350	750	50×75	0.12	5.10	ERWY351LGC751MC75M
	1,100	50×96	0.12	6.90	ERWY351LGC112MC96M
	1,300	50×105	0.12	7.80	ERWY351LGC132MCA5M
	1,600	50×130	0.12	9.50	ERWY351LGC162MCD0M
	1,800	63.5×96	0.12	10.0	ERWY351LGC182MD96M
	1,900	50×145	0.12	10.7	ERWY351LGC192MCE5M
	2,400	63.5×115	0.12	12.6	ERWY351LGC242MDB5M
	2,800	63.5×130	0.12	14.3	ERWY351LGC282MDD0M
	3,400	63.5×155	0.12	17.1	ERWY351LGC342MDF5M
	3,500	76×115	0.12	16.9	ERWY351LGC352MEB5M
	3,800	63.5×170	0.12	18.8	ERWY351LGC382MDH0M
	4,000	76×130	0.12	19.0	ERWY351LGC402MED0M
	5,000	76×155	0.12	23.0	ERWY351LGC502MEF5M
	5,600	76×170	0.12	25.3	ERWY351LGC562MEH0M
	6,900	89×155	0.12	27.2	ERWY351LGC692MFF5M
	7,700	89×170	0.12	29.6	ERWY351LGC772MFH0M
	8,400	89×190	0.12	32.9	ERWY351LGC842MFK0M
	9,500	100×190	0.12	37.3	ERWY351LGC952MGK0M
	11,000	100×220	0.12	42.9	ERWY351LGC113MGN0M
	14,000	100×270	0.12	53.1	ERWY351LGC143MGT0M
400	620	50×75	0.12	4.60	ERWY401LGC621MC75M
	880	50×96	0.12	6.10	ERWY401LGC881MC96M
	1,000	50×105	0.12	6.80	ERWY401LGC102MCA5M
	1,400	50×130	0.12	8.90	ERWY401LGC142MCD0M
	1,500	63.5×96	0.12	9.10	ERWY401LGC152MD96M
	1,600	50×145	0.12	9.90	ERWY401LGC162MCE5M
	2,000	63.5×115	0.12	11.5	ERWY401LGC202MDB5M
	2,300	63.5×130	0.12	13.0	ERWY401LGC232MDD0M
	2,800	63.5×155	0.12	15.5	ERWY401LGC282MDF5M
	2,900	76×115	0.12	15.4	ERWY401LGC292MEB5M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,300Hz)	Part No.
400	3,200	63.5×170	0.12	17.3	ERWY401LGC322MDH0M
	3,400	76×130	0.12	17.5	ERWY401LGC342MED0M
	4,200	76×155	0.12	21.1	ERWY401LGC422MEF5M
	4,600	76×170	0.12	23.0	ERWY401LGC462MEH0M
	5,700	89×155	0.12	24.7	ERWY401LGC572MFF5M
	6,400	89×170	0.12	27.0	ERWY401LGC642MFH0M
	7,000	89×190	0.12	30.0	ERWY401LGC702MFK0M
	7,900	100×190	0.12	34.0	ERWY401LGC792MGK0M
	9,400	100×220	0.12	39.6	ERWY401LGC942MGN0M
	12,000	100×270	0.12	49.2	ERWY401LGC123MGT0M
450	500	50×75	0.12	4.00	ERWY451LGC501MC75M
	710	50×96	0.12	5.20	ERWY451LGC711MC96M
	840	50×105	0.12	5.90	ERWY451LGC841MCA5M
	1,100	50×130	0.12	7.50	ERWY451LGC112MCD0M
	1,200	63.5×96	0.12	7.80	ERWY451LGC122MD96M
	1,300	50×145	0.12	8.40	ERWY451LGC132MCE5M
	1,600	63.5×115	0.12	9.80	ERWY451LGC162MDB5M
	1,800	63.5×130	0.12	10.9	ERWY451LGC182MDD0M
	2,300	63.5×155	0.12	13.3	ERWY451LGC232MDF5M
	2,300	76×115	0.12	13.0	ERWY451LGC232MEB5M
	2,500	63.5×170	0.12	14.5	ERWY451LGC252MDH0M
	2,700	76×130	0.12	14.8	ERWY451LGC272MED0M
	3,300	76×155	0.12	17.7	ERWY451LGC332MEF5M
	3,700	76×170	0.12	19.5	ERWY451LGC372MEH0M
	4,600	89×155	0.12	22.2	ERWY451LGC462MFF5M
	5,100	89×170	0.12	24.1	ERWY451LGC512MFH0M
	5,700	89×190	0.12	27.1	ERWY451LGC572MFK0M
	6,400	100×190	0.12	30.6	ERWY451LGC642MGK0M
	7,600	100×220	0.12	35.6	ERWY451LGC762MGN0M
	9,500	100×270	0.12	43.7	ERWY451LGC952MGT0M

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency (Hz)	120	300	1k	3k
Coefficient	0.83	1.00	1.25	1.33

Note : The endurance of capacitors is shorted with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for RWY series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For the details, please contact a representative of Nippon Chemi-Con.

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

RWL Series

- ●High ripple capability
- ●For train systems and high power consumed inverter circuits
- ●Endurance with ripple current : 20,000 hours at 85℃
- ●**RoHS Compliant**

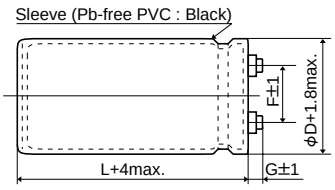
RWL
↑ Longer life
RWF

◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−25 to +85℃
Rated Voltage Range	350 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.02CV or 5mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	0.25 max. (at 20℃, 120Hz)
Low Temperature Characteristics	Capacitance change C(−25℃)/C(+20℃)≧0.7 (at 120Hz)
Insulation Resistance	When measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500Vdc, the insulation resistance shall not be less than 100MΩ.
Insulation Withstanding Voltage	When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied 20,000 hours at 85℃. Capacitance change: ≦±30% of the initial value D.F. (tanδ): ≦300% of the initial specified value Leakage current: ≦The initial specified value
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 85℃ without voltage applied. Capacitance change: ≦±20% of the initial value D.F. (tanδ): ≦300% of the initial specified value Leakage current: ≦The initial specified value

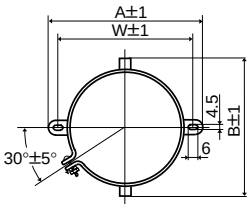
◆DIMENSIONS (Screw-Mount) [mm]

●Terminal Code : LG



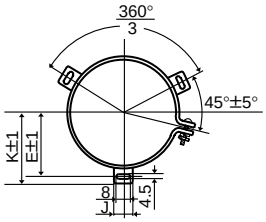
φ63.5 : G=6
φ76 & φ89 : G=5

●Mounting Clamp Code : B



φD	A	B	W	F
63.5	90.0	76.0	80.0	28.0
76	104.5	90.0	93.5	31.5

●Mounting Clamp Code : C

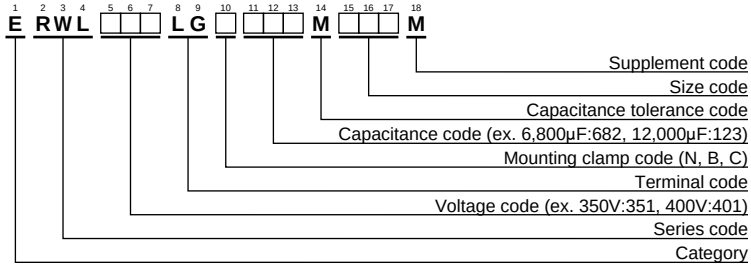


φD	E	K	F	J
63.5	38.1	43.5	28.0	14.0
76	44.5	50.0	31.5	14.0
89	50.8	56.5	31.5	16.0

<Screw specifications>
Plus hexagon-headed screw:
M5×0.8×10
Maximum screw tightening torque:
3.23Nm

* The screw and the mounting clamp are separately supplied and not attached to the product.

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (screw-mount terminal type)"

CAT. No. E1001G

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

RWL Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
350	3,300	63.5×115	0.25	11.1	ERWL351LGC332MDB5M
	3,900	63.5×130	0.25	12.8	ERWL351LGC392MDD0M
	4,700	63.5×155	0.25	15.2	ERWL351LGC472MDF5M
	4,700	76×115	0.25	14.7	ERWL351LGC472MEB5M
	5,600	63.5×170	0.25	17.3	ERWL351LGC562MDH0M
	5,600	76×130	0.25	16.9	ERWL351LGC562MED0M
	6,800	63.5×190	0.25	20.0	ERWL351LGC682MDK0M
	6,800	76×155	0.25	20.2	ERWL351LGC682MEF5M
	8,200	76×170	0.25	23.1	ERWL351LGC822MEH0M
	10,000	89×155	0.25	26.6	ERWL351LGC103MFF5M
	12,000	89×190	0.25	32.0	ERWL351LGC123MFK0M
400	2,700	63.5×115	0.25	10.1	ERWL401LGC272MDB5M
	3,300	63.5×130	0.25	11.7	ERWL401LGC332MDD0M
	3,900	63.5×155	0.25	13.8	ERWL401LGC392MDF5M
	3,900	76×115	0.25	14.7	ERWL401LGC392MEB5M
	4,700	63.5×170	0.25	15.8	ERWL401LGC472MDH0M
	4,700	76×130	0.25	15.5	ERWL401LGC472MED0M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
400	5,600	63.5×190	0.25	18.2	ERWL401LGC562MDK0M
	5,600	76×155	0.25	18.3	ERWL401LGC562MEF5M
	6,800	76×170	0.25	21.0	ERWL401LGC682MEH0M
	8,200	89×155	0.25	24.1	ERWL401LGC822MFF5M
	10,000	89×190	0.25	29.1	ERWL401LGC103MFK0M
450	2,200	63.5×115	0.25	9.10	ERWL451LGC222MDB5M
	2,700	63.5×130	0.25	10.6	ERWL451LGC272MDD0M
	2,700	76×115	0.25	11.2	ERWL451LGC272MEB5M
	3,300	63.5×155	0.25	12.7	ERWL451LGC332MDF5M
	3,300	76×130	0.25	13.0	ERWL451LGC332MED0M
	3,900	63.5×170	0.25	14.4	ERWL451LGC392MDH0M
	4,700	76×155	0.25	16.7	ERWL451LGC472MEF5M
	5,600	76×190	0.25	20.1	ERWL451LGC562MEK0M
	5,600	89×155	0.25	19.9	ERWL451LGC562MFF5M
	6,800	89×170	0.25	23.0	ERWL451LGC682MFH0M
	8,200	89×190	0.25	26.4	ERWL451LGC822MFK0M

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency (Hz)	50	120	300	1k	3k
Coefficient	0.8	1.0	1.1	1.3	1.4

Note : The endurance of capacitors is shorted with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for RWL series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For the details, please contact a representative of Nippon Chemi-Con.

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

FTP Series

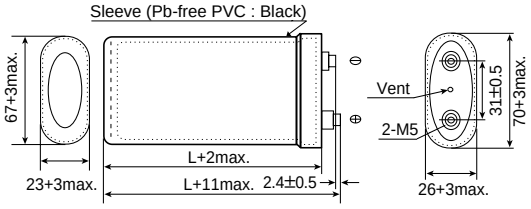
- ●Ideal for inverter smoothing capacitors such as Electric Vehicle, Hybrid Car, etc.
- ●Endurance with ripple current : 5,000 hours at 85℃
- ●Rated voltage range : 63 to 450Vdc
- ●Lower profile offers drastic space saving comparing to conventional cylindrical type
- ●Superior heat radiation realizes higher ripple current
- ●**RoHS Compliant**

◆SPECIFICATIONS

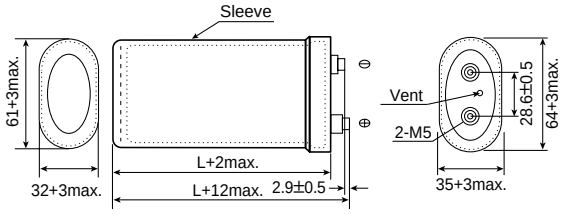
Items	Characteristics
Category Temperature Range	−40 to +85℃ (63～100Vdc), −25 to +85℃ (350～450Vdc)
Rated Voltage Range	63 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.02CV or 5mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	0.25 max. (at 20℃, 120Hz)
Low Temperature Characteristics	Capacitance change 63 to 100Vdc : C(-40℃)/C(+20℃)≧0.6 350 to 450Vdc : C(-25℃)/C(+20℃)≧0.7 (at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85℃. Capacitance change: ≦±20% of the initial value D.F. (tanδ): ≦200% of the initial specified value Leakage current: ≦The initial specified value
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied. Capacitance change: ≦±20% of the initial value D.F. (tanδ): ≦200% of the initial specified value Leakage current: ≦The initial specified value

◆DIMENSIONS (Screw-Mount) [mm]

- ●Terminal Code : LG
- ●Size Code : L



- ●Size Code : R



* Polyolefin is available upon request.

<Screw specifications>
Plus hexagon-headed screw: M5×0.8
Maximum screw tightening torque: 3.23Nm

◆PART NUMBERING SYSTEM

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
E	F	T	P				L	G	N				M				M

- Supplement code
- Size code
- Capacitance tolerance code
- Capacitance code (ex. 270μF:271, 10,000μF:103)
- Mounting clamp code
- Terminal code
- Voltage code (ex. 63V:630, 100V:101, 450V:451)
- Series code
- Category

Please refer to "A guide to global code (screw-mount terminal type)"

◆SIZE CODE

Code	Case size HXWXL (mm)
L50	26×70×50
L75	26×70×75
L95	26×70×95
R50	35×64×50
R75	35×64×75
R95	35×64×95

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85℃

FTP Series

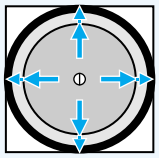
◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size HXWXL(mm)	tanδ	Rated ripple current (Arms/ 85℃,10kHz)	Part No.
63	6,000	26X70X50	0.25	14.0	EFTP630LGN602ML50M
	12,000	26X70X75	0.25	19.0	EFTP630LGN123ML75M
	17,000	26X70X95	0.25	22.0	EFTP630LGN173ML95M
	7,400	35X64X50	0.25	16.1	EFTP630LGN742MR50M
	15,000	35X64X75	0.25	21.7	EFTP630LGN153MR75M
	21,000	35X64X95	0.25	25.3	EFTP630LGN213MR95M
80	4,300	26X70X50	0.25	14.0	EFTP800LGN432ML50M
	8,600	26X70X75	0.25	19.0	EFTP800LGN862ML75M
	12,000	26X70X95	0.25	22.0	EFTP800LGN123ML95M
	5,300	35X64X50	0.25	16.1	EFTP800LGN532MR50M
	10,000	35X64X75	0.25	21.7	EFTP800LGN103MR75M
	15,000	35X64X95	0.25	25.3	EFTP800LGN153MR95M
100	2,900	26X70X50	0.25	14.0	EFTP101LGN292ML50M
	5,700	26X70X75	0.25	19.0	EFTP101LGN572ML75M
	8,100	26X70X95	0.25	22.0	EFTP101LGN812ML95M
	3,600	35X64X50	0.25	16.1	EFTP101LGN362MR50M
	7,100	35X64X75	0.25	21.7	EFTP101LGN712MR75M
	10,000	35X64X95	0.25	25.3	EFTP101LGN103MR95M

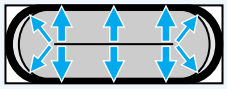
WV (Vdc)	Cap (μF)	Case size HXWXL(mm)	tanδ	Rated ripple current (Arms/ 85℃,10kHz)	Part No.
350	400	26X70X50	0.25	10.6	EFTP351LGN401ML50M
	800	26X70X75	0.25	15.7	EFTP351LGN801ML75M
	1,100	26X70X95	0.25	18.7	EFTP351LGN112ML95M
	490	35X64X50	0.25	11.9	EFTP351LGN491MR50M
	970	35X64X75	0.25	17.6	EFTP351LGN971MR75M
	1,400	35X64X95	0.25	21.0	EFTP351LGN142MR95M
400	330	26X70X50	0.25	10.6	EFTP401LGN331ML50M
	660	26X70X75	0.25	15.7	EFTP401LGN661ML75M
	930	26X70X95	0.25	18.7	EFTP401LGN931ML95M
	400	35X64X50	0.25	11.9	EFTP401LGN401MR50M
	800	35X64X75	0.25	17.6	EFTP401LGN801MR75M
	1,100	35X64X95	0.25	21.0	EFTP401LGN112MR95M
450	270	26X70X50	0.25	10.1	EFTP451LGN271ML50M
	540	26X70X75	0.25	15.0	EFTP451LGN541ML75M
	760	26X70X95	0.25	18.0	EFTP451LGN761ML95M
	330	35X64X50	0.25	11.4	EFTP451LGN331MR50M
	660	35X64X75	0.25	16.7	EFTP451LGN661MR75M
	930	35X64X95	0.25	20.1	EFTP451LGN931MR95M

◆Improvement of space factor and heat radiation

Dead spaces are found for the conventional cylindrial shape. But lower profile offers small dead spaces, and makes the equipments smaller in size. Moreover, the internal element of the lower profile capacitor is widely touched to the can. This largely improves the heat radiation compared to the cylindrical shape.



Cylindrical shape



FTP series

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS long life screw terminals ,105℃

LXA Series

- ●Rated voltage range up to 525Vdc
- ●Endurance with ripple current : 5,000 hours at 105℃ (2,000 hours for 500Vdc & 525Vdc)
- ●High reliability products
- ●**RoHS Compliant**

LXA
Long life
KMH

◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−40 to +105℃ (10 to 100Vdc) −25 to +105℃ (160 to 525Vdc)
Rated Voltage Range	10 to 525Vdc
Capacitance Tolerance	−10 to +50% (T) (10 to 250Vdc) ±20% (M) (350 to 525Vdc) (at 20℃, 120Hz)
Leakage Current	I=0.02CV or 5mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	See STANDARD RATINGS (10 to 250Vdc) 0.20max (350 to 525Vdc) (at 20℃, 120Hz)
Low Temperature Characteristics	Capacitance change C(-40℃)/C(+20℃)≧0.6(10 to 100Vdc) C(-25℃)/C(+20℃)≧0.7(160 to 250Vdc) C(-25℃)/C(+20℃)≧0.65(350 to 525Vdc) (at 120Hz)
Insulation Resistance	When measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500Vdc, the insulation resistance shall not be less than 100MΩ.
Insulation Withstanding Voltage	When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after DC voltage with the rated ripple current is applied for 5,000 hours (2,000 hours for 500 & 525Vdc products) at 105℃.

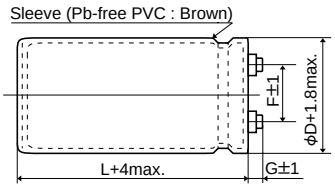
Capacitance change	≦±20% of the initial value
D.F. (tanδ)	≦200% of the initial specified value
Leakage current	≦The initial specified value

Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.

Rated voltage	10 to 250Vdc	350 to 525Vdc
Capacitance change	≦±15% of the initial value	≦±20% of the initial value
D.F. (tanδ)	≦150% of the initial specified value	≦200% of the initial specified value
Leakage current	≦The initial specified value	≦The initial specified value

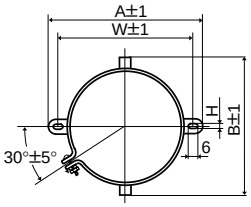
◆DIMENSIONS (Screw-Mount) [mm]

●Terminal Code : LG



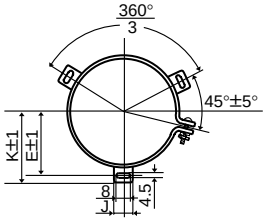
φD	G	
	10 to 250Vdc	350 to 525Vdc
～φ63.5	6	6
φ76	5	6
φ89	5	4

●Mounting Clamp Code : B



φD	A	B	W	H	F
35	58	44	48	3.5	12.7
50	78	64	68	4.5	22.4
63.5	90	76	80	4.5	28.0
76	104.5	90	93.5	4.5	31.5

●Mounting Clamp Code : C

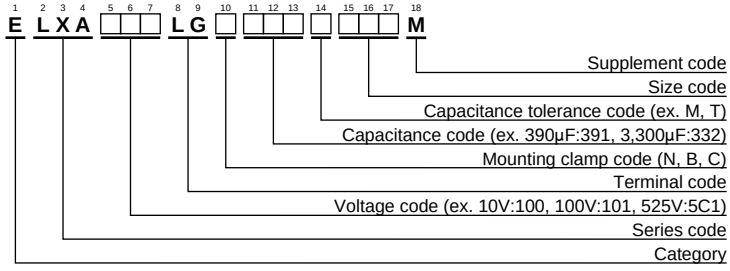


φD	E	K	J	F
50	32.5	37.0	14.0	22.4
63.5	38.1	43.5	14.0	28.0
76	44.5	50.0	14.0	31.5
89	50.8	56.5	16.0	31.5

<Screw specifications>
Plus hexagon-headed screw:
M5×0.8×10
Maximum screw tightening torque:
3.23Nm

* The screw and the mounting clamp are separately supplied and not attached to the product.

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (screw-mount terminal type)"

CAT. No. E1001G

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS long life screw terminals ,105℃

LXA Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
10	27,000	35×80	0.45	4.30	ELXA100LGB273TA80M
	33,000	35×80	0.45	4.70	ELXA100LGB333TA80M
	39,000	35×80	0.45	5.30	ELXA100LGB393TA80M
	47,000	35×100	0.45	6.10	ELXA100LGB473TAA0M
	56,000	35×100	0.50	6.20	ELXA100LGB563TAA0M
	68,000	35×120	0.60	6.80	ELXA100LGB683TAC0M
	82,000	50×80	0.60	7.80	ELXA100LGC823TC80M
	100,000	50×100	0.70	8.50	ELXA100LGC104TCA0M
	120,000	50×100	0.70	9.50	ELXA100LGC124TCA0M
	150,000	63.5×100	0.80	11.0	ELXA100LGC154TDA0M
	180,000	63.5×100	0.80	12.1	ELXA100LGC184TDA0M
	220,000	76×100	1.00	13.2	ELXA100LGC224TEA0M
	270,000	76×120	1.20	14.4	ELXA100LGC274TEC0M
	330,000	76×140	1.20	17.0	ELXA100LGC334TEE0M
	390,000	89×140	1.40	18.6	ELXA100LGC394TFE0M
16	15,000	35×50	0.45	2.90	ELXA160LGB153TA50M
	18,000	35×80	0.45	3.50	ELXA160LGB183TA80M
	22,000	35×80	0.45	3.90	ELXA160LGB223TA80M
	27,000	35×80	0.45	4.30	ELXA160LGB273TA80M
	33,000	35×100	0.50	4.80	ELXA160LGB333TAA0M
	39,000	35×100	0.50	5.30	ELXA160LGB393TAA0M
	47,000	35×120	0.50	6.20	ELXA160LGB473TAC0M
	56,000	50×80	0.60	6.30	ELXA160LGC563TC80M
	68,000	50×100	0.60	7.60	ELXA160LGC683TCA0M
	82,000	50×120	0.70	8.30	ELXA160LGC823TCC0M
	100,000	50×120	0.70	9.20	ELXA160LGC104TCC0M
	120,000	63.5×100	0.80	9.90	ELXA160LGC124TDA0M
	150,000	76×100	0.80	12.3	ELXA160LGC154TEA0M
	180,000	76×120	0.80	14.5	ELXA160LGC184TEC0M
	220,000	76×140	1.00	15.2	ELXA160LGC224TEE0M
	270,000	89×140	1.20	16.8	ELXA160LGC274TFE0M
25	12,000	35×80	0.35	3.30	ELXA250LGB123TA80M
	15,000	35×80	0.35	3.70	ELXA250LGB153TA80M
	18,000	35×80	0.35	4.00	ELXA250LGB183TA80M
	22,000	35×80	0.35	4.50	ELXA250LGB223TA80M
	27,000	35×100	0.40	5.00	ELXA250LGB273TAA0M
	33,000	35×120	0.40	5.90	ELXA250LGB333TAC0M
	39,000	50×80	0.40	6.50	ELXA250LGC393TC80M
	47,000	50×100	0.40	7.90	ELXA250LGC473TCA0M
	56,000	50×120	0.40	8.80	ELXA250LGC563TCC0M
	68,000	50×120	0.50	9.10	ELXA250LGC683TCC0M
	82,000	63.5×100	0.50	10.6	ELXA250LGC823TDA0M
	100,000	63.5×120	0.60	11.4	ELXA250LGC104TDC0M
	120,000	76×100	0.60	12.8	ELXA250LGC124TEA0M
	150,000	76×120	0.75	13.7	ELXA250LGC154TEC0M
	180,000	76×140	0.75	16.1	ELXA250LGC184TEE0M
	220,000	89×140	1.00	16.6	ELXA250LGC224TFE0M
35	8,200	35×80	0.30	3.00	ELXA350LGB822TA80M
	10,000	35×80	0.30	3.30	ELXA350LGB103TA80M
	12,000	35×80	0.30	3.60	ELXA350LGB123TA80M
	15,000	35×80	0.30	4.10	ELXA350LGB153TA80M
	18,000	35×100	0.30	4.80	ELXA350LGB183TAA0M
	22,000	35×120	0.35	5.20	ELXA350LGB223TAC0M
	27,000	50×80	0.40	5.90	ELXA350LGC273TC80M
	33,000	50×100	0.40	6.60	ELXA350LGC333TCA0M
	39,000	50×120	0.40	7.80	ELXA350LGC393TCC0M
	47,000	50×120	0.45	8.00	ELXA350LGC473TCC0M
	56,000	63.5×100	0.45	9.20	ELXA350LGC563TDA0M
	68,000	63.5×120	0.45	11.0	ELXA350LGC683TDC0M
	82,000	76×120	0.50	12.7	ELXA350LGC823TEC0M
	100,000	76×140	0.60	13.5	ELXA350LGC104TEE0M
	120,000	89×140	0.60	16.1	ELXA350LGC124TFE0M
50	3,900	35×50	0.20	2.00	ELXA500LGB392TA50M
	4,700	35×50	0.25	2.20	ELXA500LGB472TA50M
	5,600	35×80	0.25	2.80	ELXA500LGB562TA80M
	6,800	35×80	0.25	3.00	ELXA500LGB682TA80M
	8,200	35×80	0.25	3.30	ELXA500LGB822TA80M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
50	10,000	35×80	0.25	3.70	ELXA500LGB103TA80M
	12,000	35×100	0.25	4.40	ELXA500LGB123TAA0M
	15,000	35×120	0.30	4.70	ELXA500LGB153TAC0M
	18,000	50×80	0.35	4.80	ELXA500LGC183TC80M
	22,000	50×100	0.35	5.90	ELXA500LGC223TCA0M
	27,000	50×120	0.35	7.00	ELXA500LGC273TCC0M
	33,000	63.5×100	0.40	7.60	ELXA500LGC333TDA0M
	39,000	63.5×120	0.40	8.90	ELXA500LGC393TDC0M
	47,000	63.5×120	0.40	9.80	ELXA500LGC473TDC0M
	56,000	76×120	0.40	11.9	ELXA500LGC563TEC0M
	68,000	76×140	0.45	13.1	ELXA500LGC683TEE0M
	82,000	89×140	0.50	14.8	ELXA500LGC823TFE0M
63	2,700	35×50	0.15	1.90	ELXA630LGB272TA50M
	3,300	35×50	0.15	2.10	ELXA630LGB332TA50M
	3,900	35×80	0.20	2.70	ELXA630LGB392TA80M
	4,700	35×80	0.20	2.90	ELXA630LGB472TA80M
	5,600	35×80	0.20	3.20	ELXA630LGB562TA80M
	6,800	35×80	0.20	3.50	ELXA630LGB682TA80M
	8,200	35×100	0.20	4.20	ELXA630LGB822TAA0M
	10,000	35×120	0.25	4.30	ELXA630LGB103TAC0M
	12,000	50×80	0.25	4.80	ELXA630LGC123TC80M
	15,000	50×100	0.25	5.90	ELXA630LGC153TCA0M
	18,000	50×120	0.25	6.30	ELXA630LGC183TCC0M
	22,000	50×120	0.30	6.70	ELXA630LGC223TCC0M
	27,000	63.5×120	0.30	8.80	ELXA630LGC273TDC0M
	33,000	76×100	0.30	10.0	ELXA630LGC333TEA0M
	39,000	76×120	0.35	10.7	ELXA630LGC393TEC0M
	47,000	76×140	0.35	12.5	ELXA630LGC473TEE0M
	56,000	89×140	0.40	13.8	ELXA630LGC563TFE0M
80	2,200	35×50	0.15	1.90	ELXA800LGB222TA50M
	2,700	35×80	0.15	2.20	ELXA800LGB272TA80M
	3,300	35×80	0.15	2.50	ELXA800LGB332TA80M
	3,900	35×80	0.15	2.90	ELXA800LGB392TA80M
	4,700	35×100	0.15	3.10	ELXA800LGB472TAA0M
	5,600	35×100	0.15	3.50	ELXA800LGB562TAA0M
	6,800	35×120	0.20	4.10	ELXA800LGB682TAC0M
	8,200	50×80	0.20	4.80	ELXA800LGC822TC80M
	10,000	50×100	0.20	5.60	ELXA800LGC103TCA0M
	12,000	50×100	0.20	6.10	ELXA800LGC123TCA0M
	15,000	50×120	0.20	7.40	ELXA800LGC153TCC0M
	18,000	63.5×120	0.25	8.00	ELXA800LGC183TDC0M
	22,000	76×100	0.25	9.10	ELXA800LGC223TEA0M
	27,000	76×120	0.30	9.70	ELXA800LGC273TEC0M
	33,000	76×140	0.30	11.5	ELXA800LGC333TEE0M
	39,000	89×140	0.35	12.5	ELXA800LGC393TFE0M
100	1,200	35×50	0.15	1.40	ELXA101LGB122TA50M
	1,500	35×80	0.15	1.60	ELXA101LGB152TA80M
	1,800	35×80	0.15	1.80	ELXA101LGB182TA80M
	2,200	35×80	0.15	2.00	ELXA101LGB222TA80M
	2,700	35×80	0.15	2.40	ELXA101LGB272TA80M
	3,300	35×100	0.15	2.80	ELXA101LGB332TAA0M
	3,900	35×120	0.15	3.10	ELXA101LGB392TAC0M
	4,700	50×80	0.15	3.60	ELXA101LGC472TC80M
	5,600	50×100	0.15	4.30	ELXA101LGC562TCA0M
	6,800	50×120	0.15	5.00	ELXA101LGC682TCC0M
	8,200	50×120	0.15	5.50	ELXA101LGC822TCC0M
	10,000	63.5×100	0.15	6.40	ELXA101LGC103TDA0M
	12,000	63.5×120	0.20	6.60	ELXA101LGC123TDC0M
	15,000	76×100	0.20	7.50	ELXA101LGC153TEA0M
	18,000	76×120	0.25	8.00	ELXA101LGC183TEC0M
	22,000	76×140	0.25	9.40	ELXA101LGC223TEE0M
	27,000	89×140	0.30	10.4	ELXA101LGC273TFE0M
160	680	35×50	0.15	1.10	ELXA161LGB681TA50M
	820	35×80	0.15	1.20	ELXA161LGB821TA80M
	1,000	35×80	0.15	1.30	ELXA161LGB102TA80M
	1,200	35×80	0.15	1.50	ELXA161LGB122TA80M
	1,500	35×80	0.15	1.70	ELXA161LGB152TA80M

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS long life screw terminals ,105℃

LXA Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
160	1,800	35×100	0.15	2.00	ELXA161LGB182TAA0M
	2,200	35×120	0.15	2.30	ELXA161LGB222TAC0M
	2,700	35×120	0.15	2.70	ELXA161LGB272TAC0M
	3,300	50×100	0.15	3.30	ELXA161LGC332TCA0M
	3,900	50×120	0.15	3.80	ELXA161LGC392TCC0M
	4,700	50×120	0.15	4.20	ELXA161LGC472TCC0M
	5,600	50×120	0.15	4.70	ELXA161LGC562TCC0M
	6,800	63.5×120	0.15	5.70	ELXA161LGC682TDC0M
	8,200	76×100	0.20	6.40	ELXA161LGC822TEA0M
	10,000	76×120	0.20	6.60	ELXA161LGC103TEC0M
	12,000	76×140	0.20	7.80	ELXA161LGC123TEE0M
	15,000	89×140	0.20	9.50	ELXA161LGC153TFE0M
200	470	35×50	0.15	0.90	ELXA201LGB471TA50M
	560	35×80	0.15	1.00	ELXA201LGB561TA80M
	680	35×80	0.15	1.10	ELXA201LGB681TA80M
	820	35×80	0.15	1.30	ELXA201LGB821TA80M
	1,000	35×100	0.15	1.50	ELXA201LGB102TAA0M
	1,200	35×120	0.15	1.70	ELXA201LGB122TAC0M
	1,500	35×120	0.15	1.90	ELXA201LGB152TAC0M
	1,800	50×80	0.15	2.20	ELXA201LGC182TC80M
	2,200	50×100	0.15	2.70	ELXA201LGC222TCA0M
	2,700	50×120	0.15	3.20	ELXA201LGC272TCC0M
	3,300	50×120	0.15	3.50	ELXA201LGC332TCC0M
	3,900	63.5×100	0.15	4.00	ELXA201LGC392TDA0M
	4,700	63.5×120	0.15	4.70	ELXA201LGC472TDC0M
	5,600	76×100	0.15	5.30	ELXA201LGC562TEA0M
	6,800	76×120	0.15	6.30	ELXA201LGC682TEC0M
	8,200	76×140	0.20	6.40	ELXA201LGC822TEE0M
	10,000	89×140	0.20	7.70	ELXA201LGC103TFE0M
250	330	35×50	0.15	0.70	ELXA251LGB331TA50M
	390	35×80	0.15	0.80	ELXA251LGB391TA80M
	470	35×80	0.15	0.90	ELXA251LGB471TA80M
	560	35×80	0.15	1.00	ELXA251LGB561TA80M
	680	35×100	0.15	1.20	ELXA251LGB681TAA0M
	820	35×100	0.15	1.40	ELXA251LGB821TAA0M
	1,000	35×120	0.15	1.60	ELXA251LGB102TAC0M
	1,200	50×80	0.15	1.80	ELXA251LGC122TC80M
	1,500	50×100	0.15	2.20	ELXA251LGC152TCA0M
	1,800	50×120	0.15	2.60	ELXA251LGC182TCC0M
	2,200	50×120	0.15	2.80	ELXA251LGC222TCC0M
	2,700	63.5×100	0.15	3.30	ELXA251LGC272TDA0M
	3,300	63.5×120	0.15	4.00	ELXA251LGC332TDC0M
	3,900	76×100	0.15	4.40	ELXA251LGC392TEA0M
	4,700	76×120	0.15	5.20	ELXA251LGC472TEC0M
	5,600	76×140	0.15	6.10	ELXA251LGC562TEE0M
	6,800	89×140	0.15	7.40	ELXA251LGC682TFE0M
350	820	50×60	0.20	3.30	ELXA351LGC821MC60M
	1,500	50×85	0.20	5.20	ELXA351LGC152MC85M
	2,200	50×105	0.20	7.00	ELXA351LGC222MCA5M
	2,700	50×125	0.20	8.40	ELXA351LGC272MCC5M
	2,700	63.5×85	0.20	8.10	ELXA351LGC272MD85M
	3,300	50×145	0.20	9.90	ELXA351LGC332MCE5M
	3,300	63.5×105	0.20	9.80	ELXA351LGC332MDA5M
	3,900	63.5×125	0.20	11.5	ELXA351LGC392MDC5M
	3,900	76×85	0.20	10.8	ELXA351LGC392ME85M
	5,600	63.5×145	0.20	14.7	ELXA351LGC562MDE5M
	6,800	76×125	0.20	16.8	ELXA351LGC682MEC5M
	8,200	76×145	0.20	19.6	ELXA351LGC822MEE5M
	8,200	89×125	0.20	18.9	ELXA351LGC822MFC5M
	10,000	76×190	0.20	23.0	ELXA351LGC103MEK0M
	10,000	89×145	0.20	22.2	ELXA351LGC103MFE5M
	15,000	89×190	0.20	30.6	ELXA351LGC153MFK0M
	22,000	89×270	0.20	43.5	ELXA351LGC223MFT0M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
400	680	50×60	0.20	3.00	ELXA401LGC681MC60M
	1,200	50×85	0.20	4.70	ELXA401LGC122MC85M
	1,800	50×105	0.20	6.30	ELXA401LGC182MCA5M
	2,200	50×125	0.20	7.50	ELXA401LGC222MCC5M
	2,200	63.5×85	0.20	7.30	ELXA401LGC222MD85M
	2,700	50×145	0.20	8.90	ELXA401LGC272MCE5M
	2,700	63.5×105	0.20	8.80	ELXA401LGC272MDA5M
	3,300	63.5×125	0.20	10.5	ELXA401LGC332MDC5M
	3,300	76×85	0.20	9.90	ELXA401LGC332ME85M
	4,700	63.5×145	0.20	13.4	ELXA401LGC472MDE5M
	4,700	76×125	0.20	13.9	ELXA401LGC472MEC5M
	6,800	76×145	0.20	17.9	ELXA401LGC682MEE5M
	6,800	89×125	0.20	17.2	ELXA401LGC682MFC5M
	8,200	76×190	0.20	20.8	ELXA401LGC822MEK0M
	8,200	89×145	0.20	20.1	ELXA401LGC822MFE5M
	12,000	89×190	0.20	27.4	ELXA401LGC123MFK0M
	18,000	89×270	0.20	39.4	ELXA401LGC183MFT0M
450	560	50×60	0.20	2.60	ELXA451LGC561MC60M
	1,000	50×85	0.20	4.00	ELXA451LGC102MC85M
	1,200	50×105	0.20	4.80	ELXA451LGC122MCA5M
	1,800	50×125	0.20	6.40	ELXA451LGC182MCC5M
	1,800	63.5×85	0.20	6.20	ELXA451LGC182MD85M
	2,200	50×145	0.20	7.60	ELXA451LGC222MCE5M
	2,200	63.5×105	0.20	7.50	ELXA451LGC222MDA5M
	2,700	63.5×125	0.20	8.90	ELXA451LGC272MDC5M
	2,700	76×85	0.20	8.40	ELXA451LGC272ME85M
	3,300	63.5×145	0.20	10.6	ELXA451LGC332MDE5M
	3,300	76×105	0.20	10.2	ELXA451LGC332MEA5M
	3,900	76×125	0.20	11.9	ELXA451LGC392MEC5M
	4,700	76×145	0.20	14.0	ELXA451LGC472MEE5M
	5,600	89×125	0.20	14.2	ELXA451LGC562MFC5M
	6,800	76×190	0.20	17.3	ELXA451LGC682MEK0M
	6,800	89×145	0.20	16.7	ELXA451LGC682MFE5M
	10,000	89×190	0.20	22.8	ELXA451LGC103MFK0M
	15,000	89×270	0.20	32.8	ELXA451LGC153MFT0M
500	470	50×60	0.20	2.40	ELXA501LGC471MC60M
	820	50×85	0.20	3.60	ELXA501LGC821MC85M
	1,000	50×105	0.20	4.40	ELXA501LGC102MCA5M
	1,200	50×125	0.20	5.20	ELXA501LGC122MCC5M
	1,200	63.5×85	0.20	5.00	ELXA501LGC122MD85M
	1,500	50×145	0.20	6.30	ELXA501LGC152MCE5M
	1,800	63.5×105	0.20	6.80	ELXA501LGC182MDA5M
	2,700	63.5×145	0.20	9.60	ELXA501LGC272MDE5M
	2,700	76×105	0.20	9.20	ELXA501LGC272MEA5M
	3,900	76×145	0.20	12.7	ELXA501LGC392MEE5M
	3,900	89×125	0.20	11.9	ELXA501LGC392MFC5M
	6,800	89×190	0.20	18.8	ELXA501LGC682MFK0M
	10,000	89×270	0.20	26.8	ELXA501LGC103MFT0M
525	390	50×60	0.20	2.20	ELXA5C1LGC391MC60M
	680	50×85	0.20	3.30	ELXA5C1LGC681MC85M
	1,000	50×125	0.20	4.80	ELXA5C1LGC102MCC5M
	1,500	63.5×105	0.20	6.20	ELXA5C1LGC152MDA5M
	1,800	63.5×125	0.20	7.30	ELXA5C1LGC182MDC5M
	2,200	63.5×145	0.20	8.60	ELXA5C1LGC222MDE5M
	2,200	76×105	0.20	8.30	ELXA5C1LGC222MEA5M
	2,700	76×125	0.20	9.90	ELXA5C1LGC272MEC5M
	3,300	76×145	0.20	11.7	ELXA5C1LGC332MEE5M
	4,700	76×190	0.20	14.4	ELXA5C1LGC472MEK0M
	4,700	89×145	0.20	13.9	ELXA5C1LGC472MFE5M
	5,600	89×190	0.20	17.1	ELXA5C1LGC562MFK0M

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS long life screw terminals ,105℃

LXA Series

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multiplirs

(10 to 250Vdc)

Frequency (Hz)	50	120	300	1k	10k	50k
10 to 50Vdc	0.95	1.00	1.03	1.05	1.09	1.12
63 to 80Vdc	0.90	1.00	1.06	1.10	1.18	1.22
100 to 250Vdc	0.80	1.00	1.12	1.22	1.30	1.33

(350 to 525Vdc)

Frequency (Hz)	50	120	300	1k	3k
Coefficient	0.8	1.0	1.2	1.5	1.6

Note : The endurance of capacitors is shorted with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10℃ rise. When long life performance is requested in actual use, the rms ripple current has to be reduced. Also, for the LXA series capacitors (350 to 525Vdc products), using them at operating voltage can extend their lifetime. For the detail, please contact a representative of Nippon Chemi-con.

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 105℃

LXR Series

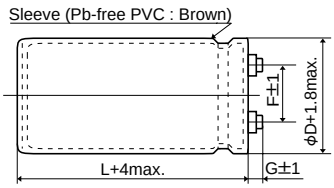
- Higher ripple capability than LXA series
- Endurance with ripple current : 5,000 hours at 105℃
- **RoHS Compliant**

◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−25 to +105℃
Rated Voltage Range	350 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.02CV or 5mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	0.15max. (at 20℃, 120Hz)
Low Temperature Characteristics	Capacitance change C (−25℃)/C(+20℃)≧0.7 (at 120Hz)
Insulation Resistance	When measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500Vdc, the insulation shall not be less than than 100MΩ.
Insulation Withstanding Voltage	When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 105℃.
	Capacitance change: ≦±20% of the initial value
	D.F. (tanδ): ≦200% of the initial specified value
	Leakage current: ≦The initial specified value
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.
	Capacitance change: ≦±20% of the initial value
	D.F. (tanδ): ≦200% of the initial specified value
	Leakage current: ≦The initial specified value

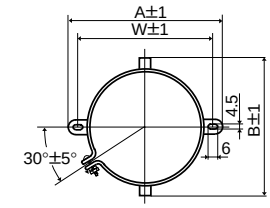
◆DIMENSIONS (Screw-Mount) [mm]

●Terminal Code : LG



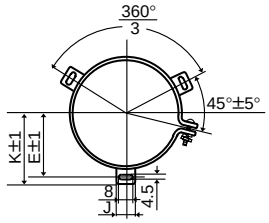
φ63.5 & φ76 : G=6
φ89 : G=4
φ100 : G=10

●Mounting Clamp Code : B



φD	A	B	W	F
63.5	90	76	80	28.0
76	104.5	90	93.5	31.5

●Mounting Clamp Code : C

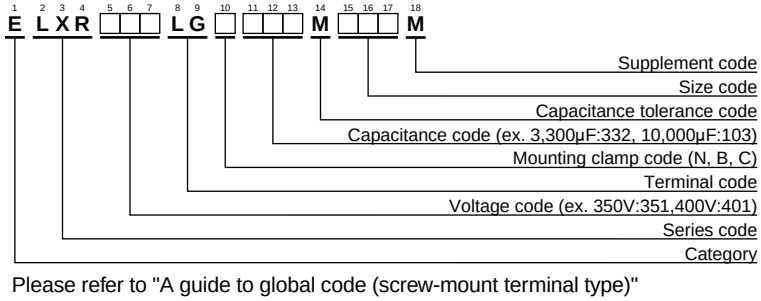


φD	E	K	F	J
63.5	38.1	43.5	28.0	14.0
76	44.5	50.0	31.5	14.0
89	50.8	56.5	31.5	16.0
100	56.5	63.4	41.5	18.0

<Screw specifications>
φ63.5 to φ89
Plus hexagon-headed screw :
M5×0.8×10
Maximum screw tightening torque :
3.23Nm
φ100
Cross-recessed head (Phillips) screw :
M8×1.25×16
Spring washer
Washer
Maximum screw tightening torque :
6.31Nm

* The screw and the mounting clamp are separately supplied and not attached to the product.

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (screw-mount terminal type)"

CAT. No. E1001G

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 105℃

LXR Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
350	3,300	63.5×115	0.15	14.4	ELXR351LGC332MDB5M
	3,900	63.5×130	0.15	16.6	ELXR351LGC392MDD0M
	4,700	63.5×155	0.15	19.8	ELXR351LGC472MDF5M
	4,700	76×115	0.15	19.1	ELXR351LGC472MEB5M
	5,600	63.5×170	0.15	22.5	ELXR351LGC562MDH0M
	5,600	76×130	0.15	21.9	ELXR351LGC562MED0M
	6,800	76×155	0.15	26.2	ELXR351LGC682MEF5M
	8,200	76×170	0.15	30.0	ELXR351LGC822MEH0M
	8,200	89×155	0.15	29.2	ELXR351LGC822MFF5M
	10,000	89×170	0.15	33.7	ELXR351LGC103MFH0M
	12,000	100×190	0.15	37.8	ELXR351LGC123MGK0M
	15,000	100×250	0.15	47.7	ELXR351LGC153MGR0M
400	2,700	63.5×115	0.15	13.1	ELXR401LGC272MDB5M
	3,300	63.5×130	0.15	15.2	ELXR401LGC332MDD0M
	3,900	63.5×155	0.15	17.9	ELXR401LGC392MDF5M
	3,900	76×115	0.15	18.2	ELXR401LGC392MEB5M
	4,700	63.5×170	0.15	20.5	ELXR401LGC472MDH0M
	4,700	76×130	0.15	20.1	ELXR401LGC472MED0M
	5,600	76×155	0.15	23.8	ELXR401LGC562MEF5M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
400	6,800	76×170	0.15	27.3	ELXR401LGC682MEH0M
	6,800	89×155	0.15	26.6	ELXR401LGC682MFF5M
	8,200	89×170	0.15	30.5	ELXR401LGC822MFH0M
	10,000	100×190	0.15	34.5	ELXR401LGC103MGK0M
	12,000	100×220	0.15	40.2	ELXR401LGC123MGN0M
450	2,200	63.5×115	0.15	11.8	ELXR451LGC222MDB5M
	2,700	63.5×130	0.15	13.7	ELXR451LGC272MDD0M
	2,700	76×115	0.15	14.5	ELXR451LGC272MEB5M
	3,300	63.5×155	0.15	16.5	ELXR451LGC332MDF5M
	3,300	76×130	0.15	16.9	ELXR451LGC332MED0M
	3,900	63.5×170	0.15	18.7	ELXR451LGC392MDH0M
	4,700	76×155	0.15	21.7	ELXR451LGC472MEF5M
	5,600	76×190	0.15	26.1	ELXR451LGC562MEK0M
	5,600	89×155	0.15	24.1	ELXR451LGC562MFF5M
	6,800	89×170	0.15	27.8	ELXR451LGC682MFH0M
	8,200	89×190	0.15	32.0	ELXR451LGC822MFK0M
	10,000	100×220	0.15	36.8	ELXR451LGC103MGN0M
	12,000	100×250	0.15	42.7	ELXR451LGC123MGR0M

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency (Hz)	120	300	1k	3k
Coefficient	1.0	1.1	1.3	1.4

The endurance of capacitors is shorted with internal heating produced by ripple current at the rate of halving the lifetime with every 5 to 10℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for the LXR series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For the details, please contact a representative of Nippon Chemi-Con.

PART NUMBERING SYSTEM

Appendix (Global code)

◆Capacitance code

* How to use the table

	1st
2nd	Cap. Value

For less than 10μF, a decimal point position is displayed with R.
For 10μF or more, capacitance code is set to the first 2 digits and index (1digit).
Treatment of fraction (Refer to the table)

Capacitance value part

2nd	1st								
	1	2	3	4	5	6	7	8	9
0	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0
A	10.5	20.5	30.5	40.5	50.5	60.5	70.5	80.5	90.5
1	11.0	21.0	31.0	41.0	51.0	61.0	71.0	81.0	91.0
B	11.5	21.5	31.5	41.5	51.5	61.5	71.5	81.5	91.5
2	12.0	22.0	32.0	42.0	52.0	62.0	72.0	82.0	92.0
C	12.5	22.5	32.5	42.5	52.5	62.5	72.5	82.5	92.5
3	13.0	23.0	33.0	43.0	53.0	63.0	73.0	83.0	93.0
D	13.5	23.5	33.5	43.5	53.5	63.5	73.5	83.5	93.5
4	14.0	24.0	34.0	44.0	54.0	64.0	74.0	84.0	94.0
E	14.5	24.5	34.5	44.5	54.5	64.5	74.5	84.5	94.5
5	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	95.0
F	15.5	25.5	35.5	45.5	55.5	65.5	75.5	85.5	95.5
6	16.0	26.0	36.0	46.0	56.0	66.0	76.0	86.0	96.0
G	16.5	26.5	36.5	46.5	56.5	66.5	76.5	86.5	96.5
7	17.0	27.0	37.0	47.0	57.0	67.0	77.0	87.0	97.0
H	17.5	27.5	37.5	47.5	57.5	67.5	77.5	87.5	97.5
8	18.0	28.0	38.0	48.0	58.0	68.0	78.0	88.0	98.0
J	18.5	28.5	38.5	48.5	58.5	68.5	78.5	88.5	98.5
9	19.0	29.0	39.0	49.0	59.0	69.0	79.0	89.0	99.0
K	19.5	29.5	39.5	49.5	59.5	69.5	79.5	89.5	99.5

Example of conversion

Real cap.	The first 2 digits	Treatment of fraction	Code 11th	Code 12th	Code 13th
10.0μF →	10.0 →	10.0 →	1	0	0
10.1μF →	10.1 →	10.0 →	1	0	0
10.2μF →	10.2 →	10.0 →	1	0	0
10.3μF →	10.3 →	10.5 →	1	A	0
10.4μF →	10.4 →	10.5 →	1	A	0
10.5μF →	10.5 →	10.5 →	1	A	0
10.6μF →	10.6 →	10.5 →	1	A	0
10.7μF →	10.7 →	10.5 →	1	A	0
10.8μF →	10.8 →	11.0 →	1	1	0
10.9μF →	10.9 →	11.0 →	1	1	0
11.0μF →	11.0 →	11.0 →	1	1	0
132μF →	13.2 →	13.0 →	1	3	1
133μF →	13.3 →	13.5 →	1	D	1
167μF →	16.7 →	16.5 →	1	G	1
168μF →	16.8 →	17.0 →	1	7	1
1110μF →	11.1 →	11.0 →	1	1	2
1340μF →	13.4 →	13.5 →	1	D	2
13200μF →	13.2 →	13.0 →	1	3	3
13600μF →	13.6 →	13.5 →	1	D	3
270000μF →	27.0 →	27.0 →	2	7	4

◆Case length (Radial lead type)

Case length [mm]	16th	17th
0.0	—	—
0.1	0	B
0.2	0	C
0.3	0	D
0.4	0	E
0.5	0	F
0.6	0	G
0.7	0	H
0.8	0	J
0.9	0	K

Case length [mm]	16th	17th
1.0	0	1
1.1	1	B
1.2	1	C
1.3	1	D
1.4	1	E
1.5	1	F
1.6	1	G
1.7	1	H
1.8	1	J
1.9	1	K

Case length [mm]	16th	17th
2.0	0	2
2.1	2	B
2.2	2	C
2.3	2	D
2.4	2	E
2.5	2	F
2.6	2	G
2.7	2	H
2.8	2	J
2.9	2	K

Case length [mm]	16th	17th
3.0	0	3
3.1	3	B
3.2	3	C
3.3	3	D
3.4	3	E
3.5	3	F
3.6	3	G
3.7	3	H
3.8	3	J
3.9	3	K

Case length [mm]	16th	17th
4.0	0	4
4.1	4	B
4.2	4	C
4.3	4	D
4.4	4	E
4.5	4	F
4.6	4	G
4.7	4	H
4.8	4	J
4.9	4	K

Case length [mm]	16th	17th
5.0	0	5
5.1	5	B
5.2	5	C
5.3	5	D
5.4	5	E
5.5	5	F
5.6	5	G
5.7	5	H
5.8	5	J
5.9	5	K

Case length [mm]	16th	17th
6.0	0	6
6.1	6	B
6.2	6	C
6.3	6	D
6.4	6	E
6.5	6	F
6.6	6	G
6.7	6	H
6.8	6	J
6.9	6	K

Case length [mm]	16th	17th
7.0	0	7
7.1	7	B
7.2	7	C
7.3	7	D
7.4	7	E
7.5	7	F
7.6	7	G
7.7	7	H
7.8	7	J
7.9	7	K

Case length [mm]	16th	17th
8.0	0	8
8.1	8	B
8.2	8	C
8.3	8	D
8.4	8	E
8.5	8	F
8.6	8	G
8.7	8	H
8.8	8	J
8.9	8	K

Case length [mm]	16th	17th
9.0	0	9
9.1	9	B
9.2	9	C
9.3	9	D
9.4	9	E
9.5	9	F
9.6	9	G
9.7	9	H
9.8	9	J
9.9	9	K

Case length [mm]	16th	17th
10.0	1	0
10.1	A	1
10.2	A	2
10.3	A	3
10.4	A	4
10.5	A	5
10.6	A	6
10.7	A	7
10.8	A	8
10.9	A	9

Case length [mm]	16th	17th
11.0	1	1
11.1	B	1
11.2	B	2
11.3	B	3
11.4	B	4
11.5	B	5
11.6	B	6
11.7	B	7
11.8	B	8
11.9	B	9

Case length [mm]	16th	17th
12.0	1	2
12.1	C	1
12.2	C	2
12.3	C	3
12.4	C	4
12.5	C	5
12.6	C	6
12.7	C	7
12.8	C	8
12.9	C	9

Case length [mm]	16th	17th
13.0	1	3
13.1	D	1
13.2	D	2
13.3	D	3
13.4	D	4
13.5	D	5
13.6	D	6
13.7	D	7
13.8	D	8
13.9	D	9

Case length [mm]	16th	17th
14.0	1	4
14.1	E	1
14.2	E	2
14.3	E	3
14.4	E	4
14.5	E	5
14.6	E	6
14.7	E	7
14.8	E	8
14.9	E	9

PART NUMBERING SYSTEM

Case length [mm]	16th	17th
15.0	1	5
15.1	F	1
15.2	F	2
15.3	F	3
15.4	F	4
15.5	F	5
15.6	F	6
15.7	F	7
15.8	F	8
15.9	F	9

Case length [mm]	16th	17th
16.0	1	6
16.1	G	1
16.2	G	2
16.3	G	3
16.4	G	4
16.5	G	5
16.6	G	6
16.7	G	7
16.8	G	8
16.9	G	9

Case length [mm]	16th	17th
17.0	1	7
17.1	H	1
17.2	H	2
17.3	H	3
17.4	H	4
17.5	H	5
17.6	H	6
17.7	H	7
17.8	H	8
17.9	H	9

Case length [mm]	16th	17th
18.0	1	8
18.1	J	1
18.2	J	2
18.3	J	3
18.4	J	4
18.5	J	5
18.6	J	6
18.7	J	7
18.8	J	8
18.9	J	9

Case length [mm]	16th	17th
19.0	1	9
19.1	K	1
19.2	K	2
19.3	K	3
19.4	K	4
19.5	K	5
19.6	K	6
19.7	K	7
19.8	K	8
19.9	K	9

Case length [mm]	16th	17th
20.0	2	0
20.5	L	1
21.0	2	1
21.5	L	3
22.0	2	2
22.5	L	5
23.0	2	3
23.5	L	7
24.0	2	4
24.5	L	9
25.0	2	5
25.5	M	1
26.0	2	6
26.5	M	3
27.0	2	7
27.5	M	5
28.0	2	8
28.5	M	7
29.0	2	9
29.5	M	9

Case length [mm]	16th	17th
30.0	3	0
30.5	N	1
31.0	3	1
31.5	N	3
32.0	3	2
32.5	N	5
33.0	3	3
33.5	N	7
34.0	3	4
34.5	N	9
35.0	3	5
35.5	P	1
36.0	3	6
36.5	P	3
37.0	3	7
37.5	P	5
38.0	3	8
38.5	P	7
39.0	3	9
39.5	P	9

Case length [mm]	16th	17th
40.0	4	0
40.5	Q	1
41.0	4	1
41.5	Q	3
42.0	4	2
42.5	Q	5
43.0	4	3
43.5	Q	7
44.0	4	4
44.5	Q	9
45.0	4	5
45.5	R	1
46.0	4	6
46.5	R	3
47.0	4	7
47.5	R	5
48.0	4	8
48.5	R	7
49.0	4	9
49.5	R	9

Case length [mm]	16th	17th
50.0	5	0
50.5	S	1
51.0	5	1
51.5	S	3
52.0	5	2
52.5	S	5
53.0	5	3
53.5	S	7
54.0	5	4
54.5	S	9
55.0	5	5
55.5	T	1
56.0	5	6
56.5	T	3
57.0	5	7
57.5	T	5
58.0	5	8
58.5	T	7
59.0	5	9
59.5	T	9

Case length [mm]	16th	17th
60.0	6	0
60.5	U	1
61.0	6	1
61.5	U	3
62.0	6	2
62.5	U	5
63.0	6	3
63.5	U	7
64.0	6	4
64.5	U	9
65.0	6	5
65.5	V	1
66.0	6	6
66.5	V	3
67.0	6	7
67.5	V	5
68.0	6	8
68.5	V	7
69.0	6	9
69.5	V	9

Case length [mm]	16th	17th
70.0	7	0
70.5	W	1
71.0	7	1
71.5	W	3
72.0	7	2
72.5	W	5
73.0	7	3
73.5	W	7
74.0	7	4
74.5	W	9
75.0	7	5
75.5	X	1
76.0	7	6
76.5	X	3
77.0	7	7
77.5	X	5
78.0	7	8
78.5	X	7
79.0	7	9
79.5	X	9

Case length [mm]	16th	17th
80.0	8	0
80.5	Y	1
81.0	8	1
81.5	Y	3
82.0	8	2
82.5	Y	5
83.0	8	3
83.5	Y	7
84.0	8	4
84.5	Y	9
85.0	8	5
85.5	Z	1
86.0	8	6
86.5	Z	3
87.0	8	7
87.5	Z	5
88.0	8	8
88.5	Z	7
89.0	8	9
89.5	Z	9

PART NUMBERING SYSTEM

◆Case length (Snap-in type / Screw mount terminal type)

Case length [mm]	16th	17th
20	2	0
21	2	1
22	2	2
23	2	3
24	2	4
25	2	5
26	2	6
27	2	7
28	2	8
29	2	9

Case length [mm]	16th	17th
30	3	0
31	3	1
32	3	2
33	3	3
34	3	4
35	3	5
36	3	6
37	3	7
38	3	8
39	3	9

Case length [mm]	16th	17th
40	4	0
41	4	1
42	4	2
43	4	3
44	4	4
45	4	5
46	4	6
47	4	7
48	4	8
49	4	9

Case length [mm]	16th	17th
50	5	0
51	5	1
52	5	2
53	5	3
54	5	4
55	5	5
56	5	6
57	5	7
58	5	8
59	5	9

Case length [mm]	16th	17th
60	6	0
61	6	1
62	6	2
63	6	3
64	6	4
65	6	5
66	6	6
67	6	7
68	6	8
69	6	9

Case length [mm]	16th	17th
70	7	0
71	7	1
72	7	2
73	7	3
74	7	4
75	7	5
76	7	6
77	7	7
78	7	8
79	7	9

Case length [mm]	16th	17th
80	8	0
81	8	1
82	8	2
83	8	3
84	8	4
85	8	5
86	8	6
87	8	7
88	8	8
89	8	9

Case length [mm]	16th	17th
90	9	0
91	9	1
92	9	2
93	9	3
94	9	4
95	9	5
96	9	6
97	9	7
98	9	8
99	9	9

Case length [mm]	16th	17th
100	A	0
101	A	1
102	A	2
103	A	3
104	A	4
105	A	5
106	A	6
107	A	7
108	A	8
109	A	9

Case length [mm]	16th	17th
110	B	0
111	B	1
112	B	2
113	B	3
114	B	4
115	B	5
116	B	6
117	B	7
118	B	8
119	B	9

Case length [mm]	16th	17th
120	C	0
121	C	1
122	C	2
123	C	3
124	C	4
125	C	5
126	C	6
127	C	7
128	C	8
129	C	9

Case length [mm]	16th	17th
130	D	0
131	D	1
132	D	2
133	D	3
134	D	4
135	D	5
136	D	6
137	D	7
138	D	8
139	D	9

Case length [mm]	16th	17th
140	E	0
141	E	1
142	E	2
143	E	3
144	E	4
145	E	5
146	E	6
147	E	7
148	E	8
149	E	9

Case length [mm]	16th	17th
150	F	0
151	F	1
152	F	2
153	F	3
154	F	4
155	F	5
156	F	6
157	F	7
158	F	8
159	F	9

Case length [mm]	16th	17th
160	G	0
161	G	1
162	G	2
163	G	3
164	G	4
165	G	5
166	G	6
167	G	7
168	G	8
169	G	9

Case length [mm]	16th	17th
170	H	0
171	H	1
172	H	2
173	H	3
174	H	4
175	H	5
176	H	6
177	H	7
178	H	8
179	H	9

Case length [mm]	16th	17th
180	J	0
181	J	1
182	J	2
183	J	3
184	J	4
185	J	5
186	J	6
187	J	7
188	J	8
189	J	9

Case length [mm]	16th	17th
190	K	0
191	K	1
192	K	2
193	K	3
194	K	4
195	K	5
196	K	6
197	K	7
198	K	8
199	K	9

Case length [mm]	16th	17th
200	L	0
201	L	1
202	L	2
203	L	3
204	L	4
205	L	5
206	L	6
207	L	7
208	L	8
209	L	9

Case length [mm]	16th	17th
210	M	0
211	M	1
212	M	2
213	M	3
214	M	4
215	M	5
216	M	6
217	M	7
218	M	8
219	M	9

Case length [mm]	16th	17th
220	N	0
221	N	1
222	N	2
223	N	3
224	N	4
225	N	5
226	N	6
227	N	7
228	N	8
229	N	9

Case length [mm]	16th	17th
230	P	0
231	P	1
232	P	2
233	P	3
234	P	4
235	P	5
236	P	6
237	P	7
238	P	8
239	P	9

Case length [mm]	16th	17th
240	Q	0
241	Q	1
242	Q	2
243	Q	3
244	Q	4
245	Q	5
246	Q	6
247	Q	7
248	Q	8
249	Q	9

Case length [mm]	16th	17th
250	R	0
251	R	1
252	R	2
253	R	3
254	R	4
255	R	5
256	R	6
257	R	7
258	R	8
259	R	9

PART NUMBERING SYSTEM

◆Supplement code

Surface mount type / Conductive polymer (Include Radial lead type)

	Terminal plating material (Radial lead type)		
	Sn100%	Sn-Bi	Sn-Pb
Coating case	S	G	N

Radial lead type / Snap-in type

		Terminal plating material (Radial lead type)		
		Sn100%	Sn-Bi	Sn-Pb
Outer sleeve	PET	S	D	C
	Coating case	H	G	F
	Polyolefin	L	—	—
	Pb-free PVC	M	—	N
	PVC	B	A	N

* Pb-free snap-in type does not have top disk.
We also produce Pb-free snap-in type with "Top disk, Pb-free PVC sleeve and Sn100% terminal plating".
In this case, supplement code (the 18th digit) becomes "T".

Screw mount terminal type

	Screw terminal
Pb-free PVC	M
Polyolefin	S
PET	C
PVC	N