NIPPON CHEMI-CON

MINIATURE 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.

GROUP CHART

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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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GROUP CHART

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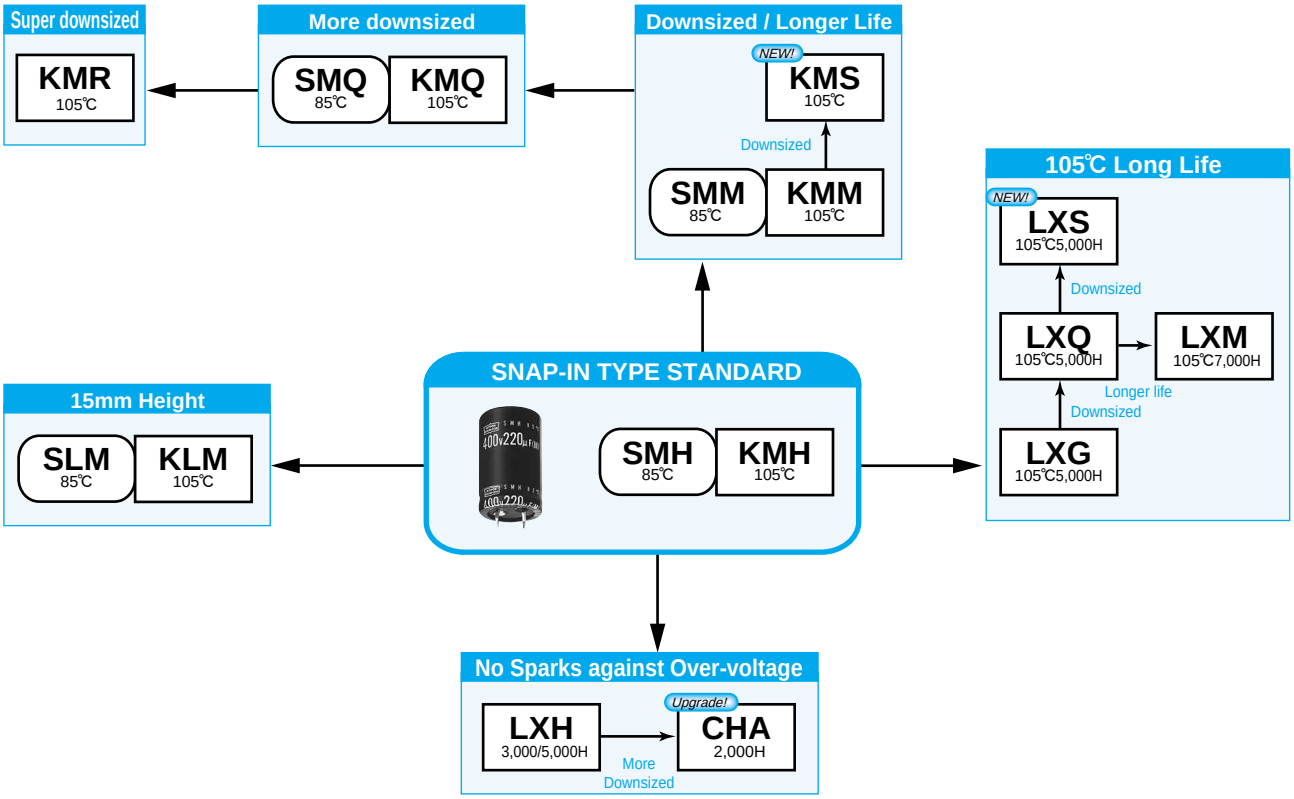
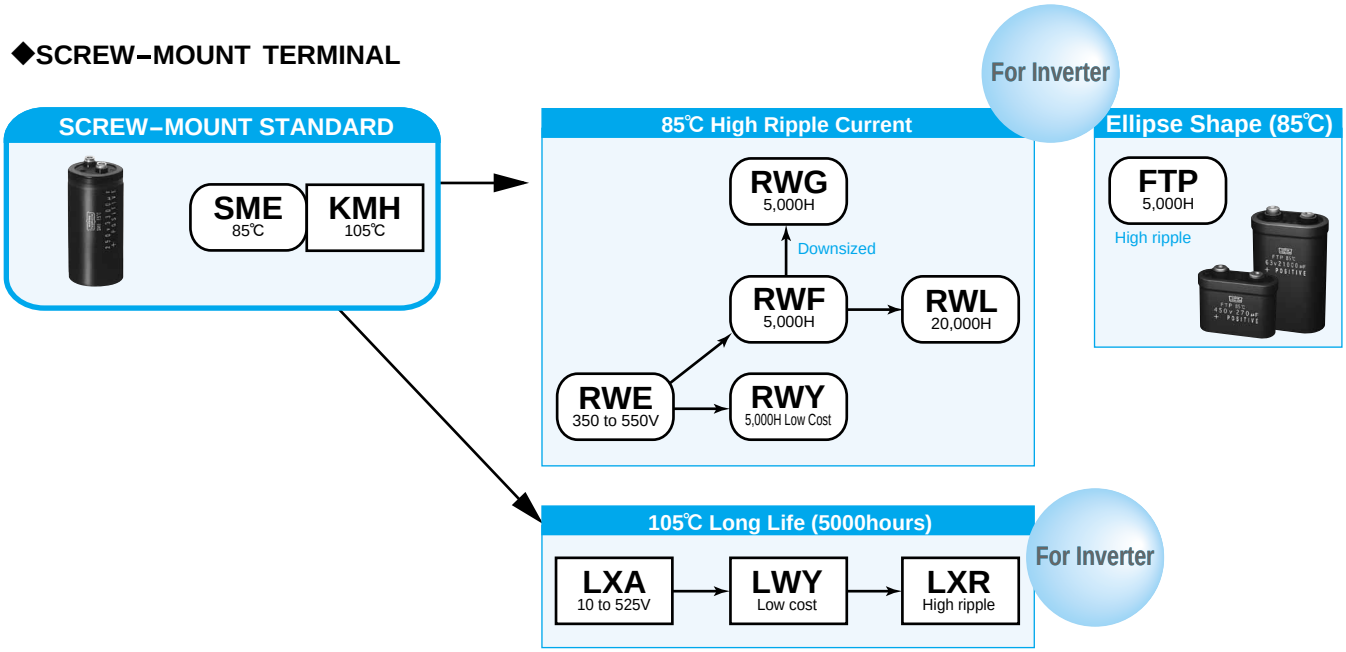
ALUMINUM ELECTROLYTIC CAPACITORS

◆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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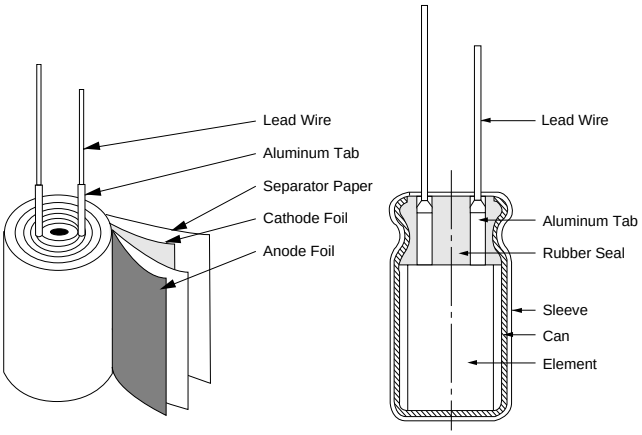
Structure of Aluminum Electrolytic Capacitors

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.

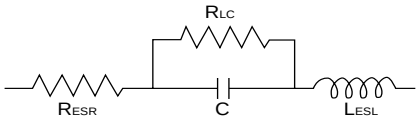
Cathode aluminum foil:
As in the first manufacturing process of the positive foil, the cathode foil requires etching process. Generally, it does not require the formation process; therefore, the natural oxide layer of Al_2O_3, which gives a characteristic dielectric voltage of 1.0 volts, is formed.

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.

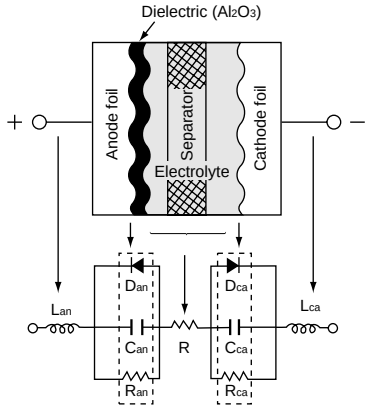
Can case and sealing materials:
The foils and separator are wound into a cylinder to make an internal element, which is impregnated with the electrolyte, inserted into an aluminum can case and sealed. During the service life of a capacitor, electrolyte slowly and naturally vaporizes by electrochemical 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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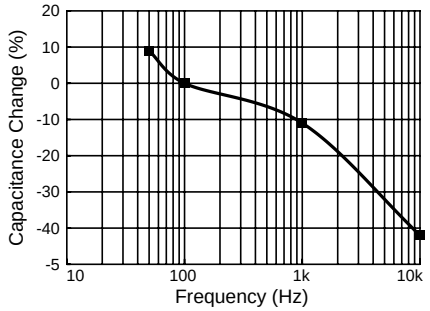
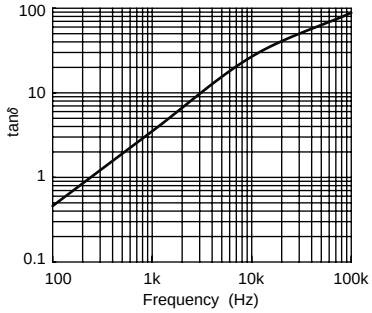
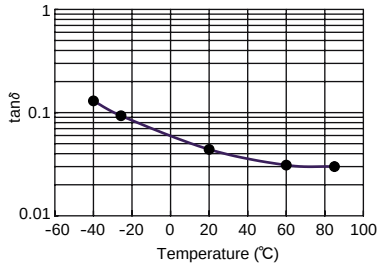
by measuring impedance and separating factors. Also, the AC capacitance depends upon frequency, voltage and other measuring methods. In fact, JIS C 5101 prescribes that the series capacitive factor of an equivalent series( ) circuit shall be the capacitance measured at a frequency of 120Hz and applying 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

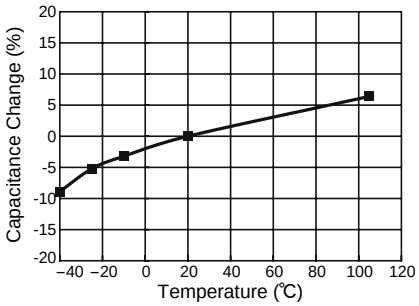


tanδ VS. Frequency



Temperature Characteristics of tanδ

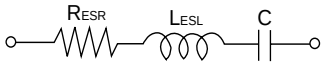
The capacitance value is highly dependent upon temperature and frequency. As the temperature decreases, the capacitance becomes smaller. See the typical behavior shown below.

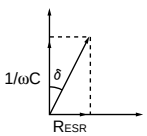


Temperature Characteristics of Capacitance

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.

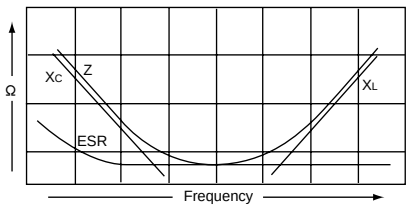
Equivalent series resistance (ESR):
The ESR is the series resistance consisting of the aluminum oxide layer, electrolyte/separator combination, and other resistance related factors, foil length, foil surface area and others.
The ESR value depends upon the temperature. Decreasing the temperature makes 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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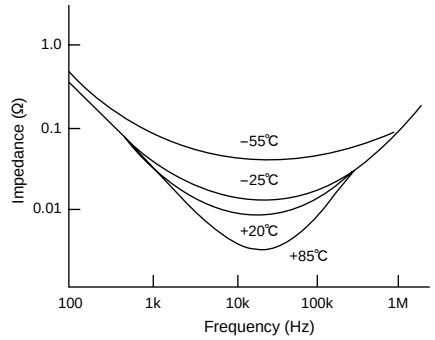
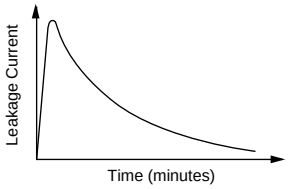


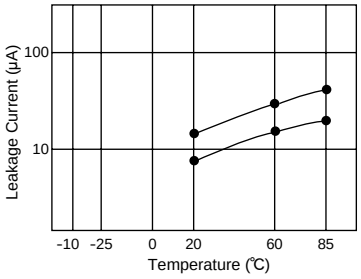
Temperature Characteristics of Impedance

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.

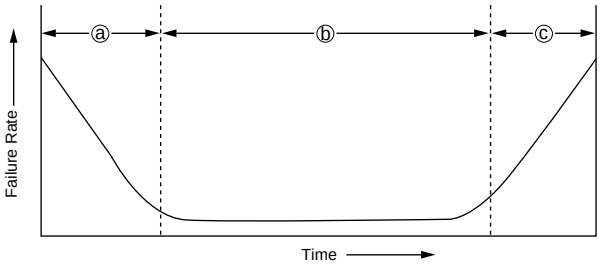


Typical Temperature Characteristics

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.)

PRECAUTIONS AND GUIDELINES

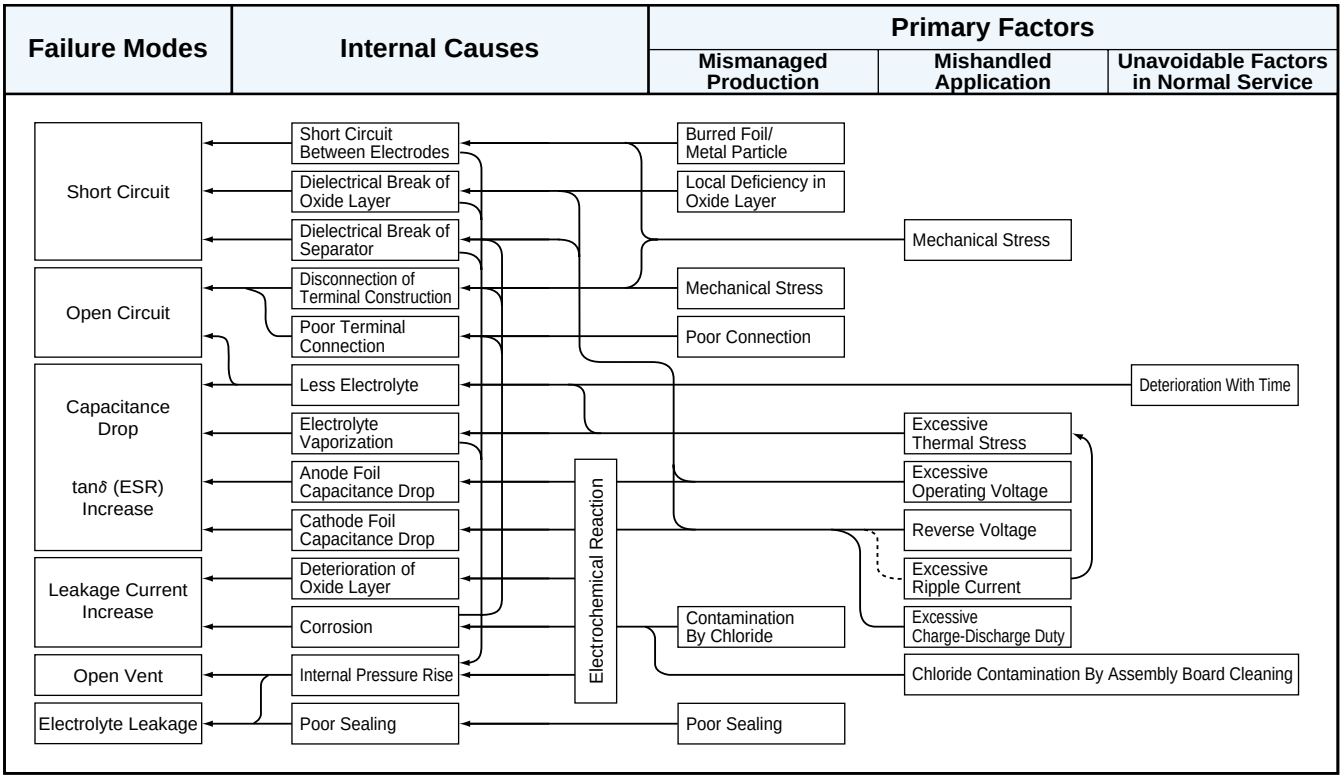


Table1

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.

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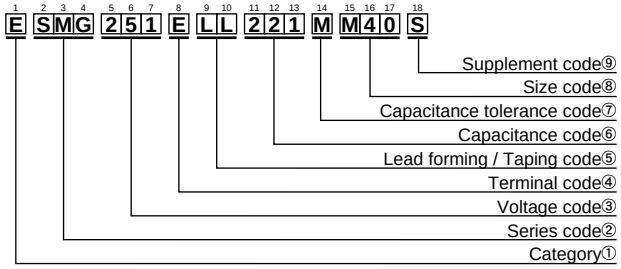
NIPPON CHEMI-CON

PART NUMBERING SYSTEM

A guide to global code (Radial lead type)

(Example : SMG series, 250V-220μF, ϕ18×40L, Straight lead with bulk)

Refer to the following table about radial lead type



①Category

Type	Code
	1th
Polar	E
Bi-polar	B

②Series code

Series name	Code		
	2th	3th	4th
SMG	S	M	G
FL	F	L	–
No series name	C	S	T

③Voltage code

Voltage (V)	Code		
	5th	6th	7th
4	4	R	0
6.3	6	R	3
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
420	4	2	1
450	4	5	1
500	5	0	1

④Terminal code

Type	Code
	8th
Radial lead	E

⑤Lead forming / Taping code

Type	Contents	Code	
		9th	10th
Lead forming (Radial lead /Bulk)	Straight	L	L
	CC(3.5mm)	C	3
	CC(5.0mm)	C	5
	FC	F	C
	FM	F	M
	MC	M	C
	BC	B	C
	RC	R	C
Taping (Radial lead)	Straight	T	D
	Sloping clinch		
	Straight (Skip a hole)	T	E
	Clinch (F=2.5mm)	T	A
	Clinch (F=3.5mm)	T	B
	Clinch (F=5.0mm)	T	C

Refer product guide for lead forming and taping specifications.

⑥Capacitance code

Cap. (μF)	Code		
	11th	12th	13th
0.10	R	1	0
0.22	R	2	2
0.33	R	3	3
0.47	R	4	7
0.68	R	6	8
1.0	1	R	0
2.2	2	R	2
3.3	3	R	3
4.7	4	R	7
6.8	6	R	8
10	1	0	0
22	2	2	0
33	3	3	0
47	4	7	0
68	6	8	0
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

⑦Capacitance tolerance

Tol. (%)	Code
	14th
±20	M
±10	K
-10 to +30	Q
-10 to +50	T

⑧Size code

ϕD	Code
	15th
4	D
5	E
6.3	F
8	H
10	J
12.5	K
14.5	U
16	L
18	M
20	N
22	P
25.4	Q

L	Code	
	16th	17th
5	0	5
7	0	7
9	0	9
11	1	1
11.5	B	5
12.0	1	2
12.5	C	5
13	1	3
15	1	5
16	1	6
20	2	0
25	2	5
30	3	0
31.5	N	3
35	3	5
35.5	P	1
40	4	0
45	4	5
50	5	0
55	5	5
60	6	0

⑨Supplement code

Sleeve material	Terminal plating material	Code
		18th
PET	Sn100%	S
	Sn-Bi	D
	Sn-Pb	C
Sleeveless (Coating case)	Sn-Bi	G
	Sn-Pb	F
PVC	Sn100%	B
	Sn-Bi	A
	Sn-Pb	N

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

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 5mm height, 85℃

SRM Series

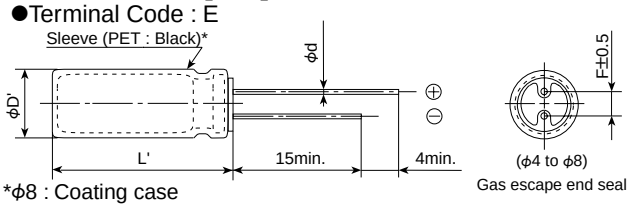
- Downsized from current standard SRE series
- 5mm height
- Endurance : 1,000 hours at 85℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

◆SPECIFICATIONS

Items	Characteristics								
Category Temperature Range	−40 to +85℃								
Rated Voltage Range	4 to 50Vdc								
Capacitance Tolerance	±20% (M)								(at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)								(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	4V	6.3V	10V	16V	25V	35V	50V	
	tanδ (Max.)	0.40	0.38	0.30	0.23	0.17	0.15	0.13	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	4V	6.3V	10V	16V	25V	35V	50V	
	Z(−25℃)/Z(+20℃)	7	4	3	2	2	2	2	
	Z(−40℃)/Z(+20℃)	15	8	8	6	4	3	3	(at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 1,000 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 [mm]

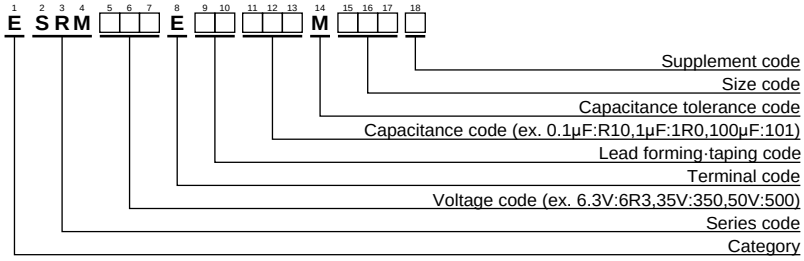
- Terminal Code : E



*φ8 : Coating case

φD	4	5	6.3	8
φd	0.45	0.45	0.45	0.45
F	1.5	2.0	2.5	2.5
φD'	φD+0.5max.			
L'	L+1.0max.			

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
4	100	5X5	0.40	55	ESRM4R0E□□101ME05D
	220	6.3X5	0.40	88	ESRM4R0E□□221MF05D
6.3	22	4X5	0.38	22	ESRM6R3E□□220MD05D
	47	4X5	0.38	40	ESRM6R3E□□470MD05D
	330	8X5	0.38	141	ESRM6R3E□□331MH05G
10	33	4X5	0.30	36	ESRM100E□□330MD05D
	100	6.3X5	0.30	78	ESRM100E□□101MF05D
	220	8X5	0.30	148	ESRM100E□□221MH05G
16	10	4X5	0.23	18	ESRM160E□□100MD05D
	22	4X5	0.23	33	ESRM160E□□220MD05D
	33	5X5	0.23	47	ESRM160E□□330ME05D
	47	5X5	0.23	55	ESRM160E□□470ME05D
25	4.7	4X5	0.17	13	ESRM250E□□4R7MD05D
	10	4X5	0.17	25	ESRM250E□□100MD05D
	22	5X5	0.17	41	ESRM250E□□220ME05D
	47	6.3X5	0.17	63	ESRM250E□□470MF05D

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
25	100	8X5	0.17	116	ESRM250E□□101MH05G
35	3.3	4X5	0.15	12	ESRM350E□□3R3MD05D
	33	6.3X5	0.15	56	ESRM350E□□330MF05D
	47	8X5	0.15	85	ESRM350E□□470MH05G
50	0.10	4X5	0.13	1.3	ESRM500E□□R10MD05D
	0.22	4X5	0.13	2.9	ESRM500E□□R22MD05D
	0.33	4X5	0.13	4.2	ESRM500E□□R33MD05D
	0.47	4X5	0.13	5.0	ESRM500E□□R47MD05D
	1.0	4X5	0.13	7.2	ESRM500E□□1R0MD05D
	2.2	4X5	0.13	10	ESRM500E□□2R2MD05D
	3.3	4X5	0.13	14	ESRM500E□□3R3MD05D
	4.7	4X5	0.13	19	ESRM500E□□4R7MD05D
	10	5X5	0.13	31	ESRM500E□□100ME05D
	22	6.3X5	0.13	49	ESRM500E□□220MF05D
	33	8X5	0.13	76	ESRM500E□□330MH05G

□□ : Fill with appropriate lead forming or taping code.
Note : ▭ had been unified to φ4X5.

CAT. No. E1001G

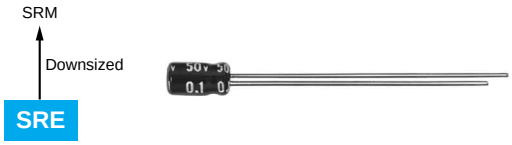
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

5mm height, 85℃

SRE Series

- 5mm height
- Endurance : 1,000 hours at 85℃
- Non solvent-proof type
- **RoHS Compliant**

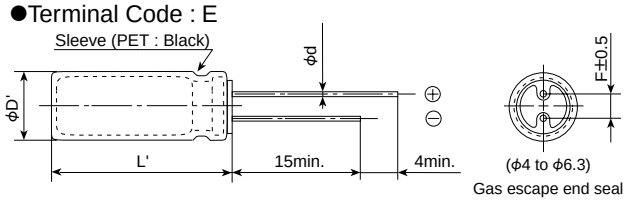


◆SPECIFICATIONS

Items	Characteristics								
Category Temperature Range	−40 to +85℃								
Rated Voltage Range	4 to 50Vdc								
Capacitance Tolerance	±20% (M)								(at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)								(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	4V	6.3V	10V	16V	25V	35V	50V	
	tanδ (Max.)	0.35	0.24	0.20	0.16	0.14	0.12	0.10	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	4V	6.3V	10V	16V	25V	35V	50V	
	Z(−25℃)/Z(+20℃)	7	4	3	2	2	2	2	
	Z(−40℃)/Z(+20℃)	15	10	8	6	4	3	3	(at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 1,000 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							

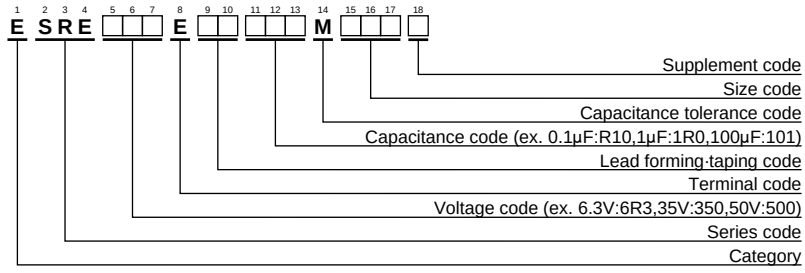
◆DIMENSIONS [mm]

- Terminal Code : E



φD	4	5	6.3
φd	0.45	0.45	0.45
F	1.5	2.0	2.5
φD'	φD+0.5max.		
L'	L+1.0max.		

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

5mm height, 85℃

SRE Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
4	33	4X5	0.35	23	ESRE4R0E□□330MD05D
6.3	10	4X5	0.24	12	ESRE6R3E□□100MD05D
	15	4X5	0.24	17	ESRE6R3E□□150MD05D
	22	4X5	0.24	23	ESRE6R3E□□220MD05D
	47	5X5	0.24	38	ESRE6R3E□□470ME05D
	100	6.3X5	0.24	60	ESRE6R3E□□101MF05D
10	6.8	4X5	0.20	11	ESRE100E□□6R8MD05D
	15	4X5	0.20	20	ESRE100E□□150MD05D
	33	5X5	0.20	35	ESRE100E□□330ME05D
	68	6.3X5	0.20	54	ESRE100E□□680MF05D
16	4.7	4X5	0.16	10	ESRE160E□□4R7MD05D
	6.8	4X5	0.16	14	ESRE160E□□6R8MD05D
	10	4X5	0.16	17	ESRE160E□□100MD05D
	15	5X5	0.16	26	ESRE160E□□150ME05D
	22	5X5	0.16	32	ESRE160E□□220ME05D
	47	6.3X5	0.16	50	ESRE160E□□470MF05D
25	3.3	4X5	0.14	9.3	ESRE250E□□3R3MD05D
	4.7	4X5	0.14	12	ESRE250E□□4R7MD05D
	6.8	4X5	0.14	16	ESRE250E□□6R8MD05D
	33	6.3X5	0.14	45	ESRE250E□□330MF05D

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
35	2.2	4X5	0.12	8.3	ESRE350E□□2R2MD05D
	3.3	4X5	0.12	11	ESRE350E□□3R3MD05D
	4.7	4X5	0.12	15	ESRE350E□□4R7MD05D
	6.8	5X5	0.12	20	ESRE350E□□6R8ME05D
	10	5X5	0.12	25	ESRE350E□□100ME05D
	15	6.3X5	0.12	33	ESRE350E□□150MF05D
	22	6.3X5	0.12	40	ESRE350E□□220MF05D
50	0.10	4X5	0.10	1.3	ESRE500E□□R10MD05D
	0.15	4X5	0.10	2.0	ESRE500E□□R15MD05D
	0.22	4X5	0.10	2.9	ESRE500E□□R22MD05D
	0.33	4X5	0.10	3.5	ESRE500E□□R33MD05D
	0.47	4X5	0.10	4.2	ESRE500E□□R47MD05D
	0.68	4X5	0.10	5.1	ESRE500E□□R68MD05D
	1.0	4X5	0.10	6.2	ESRE500E□□1R0MD05D
	1.5	4X5	0.10	7.5	ESRE500E□□1R5MD05D
	2.2	4X5	0.10	10	ESRE500E□□2R2MD05D
	3.3	4X5	0.10	14	ESRE500E□□3R3MD05D
	4.7	5X5	0.10	19	ESRE500E□□4R7ME05D
	6.8	6.3X5	0.10	24	ESRE500E□□6R8MF05D
	10	6.3X5	0.10	29	ESRE500E□□100MF05D

□□ : Fill with appropriate lead forming or taping code.
Note : ▭ had been unified to φ4X5.

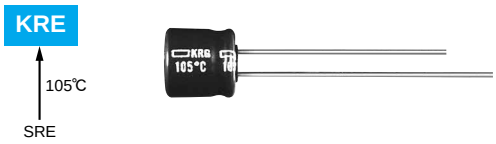
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

5mm height, 105℃

KRE Series

- 5mm height
- Endurance : 1,000 hours at 105℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

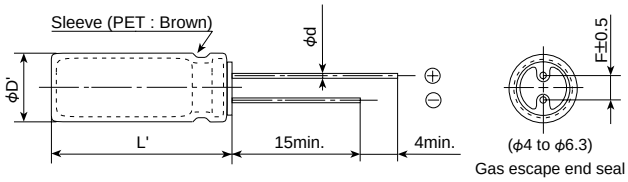


◆SPECIFICATIONS

Items	Characteristics							
Category Temperature Range	−55 to +105℃							
Rated Voltage Range	6.3 to 50Vdc							
Capacitance Tolerance	±20% (M)							(at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)							(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	
	tanδ (Max.)	0.27	0.23	0.19	0.15	0.13	0.11	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	
	Z(−25℃)/Z(+20℃)	3	3	2	2	2	2	
	Z(−40℃)/Z(+20℃)	9	7	5	3	3	3	(at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 1,000 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						

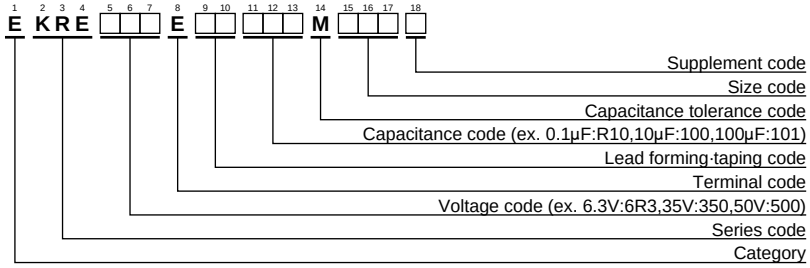
◆DIMENSIONS [mm]

- Terminal Code : E



φD	4	5	6.3
φd	0.45	0.45	0.45
F	1.5	2.0	2.5
φD'	φD+0.5max.		
L'	L+1.0max.		

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

5mm height, 105℃

KRE Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
6.3	10	4×5	0.27	12	EKRE6R3E□□100MD05D
	15	4×5	0.27	16	EKRE6R3E□□150MD05D
	22	4×5	0.27	21	EKRE6R3E□□220MD05D
	47	5×5	0.27	36	EKRE6R3E□□470ME05D
	100	6.3×5	0.27	56	EKRE6R3E□□101MF05D
10	6.8	4×5	0.23	11	EKRE100E□□6R8MD05D
	15	4×5	0.23	20	EKRE100E□□150MD05D
	33	5×5	0.23	34	EKRE100E□□330ME05D
	68	6.3×5	0.23	52	EKRE100E□□680MF05D
16	4.7	4×5	0.19	9.4	EKRE160E□□4R7MD05D
	6.8	4×5	0.19	13	EKRE160E□□6R8MD05D
	10	4×5	0.19	16	EKRE160E□□100MD05D
	15	5×5	0.19	25	EKRE160E□□150ME05D
	22	5×5	0.19	30	EKRE160E□□220ME05D
	47	6.3×5	0.19	48	EKRE160E□□470MF05D
25	3.3	4×5	0.15	8.8	EKRE250E□□3R3MD05D
	4.7	4×5	0.15	12	EKRE250E□□4R7MD05D
	6.8	4×5	0.15	16	EKRE250E□□6R8MD05D
	33	6.3×5	0.15	45	EKRE250E□□330MF05D
35	2.2	4×5	0.13	7.7	EKRE350E□□2R2MD05D
	3.3	4×5	0.13	11	EKRE350E□□3R3MD05D
	4.7	4×5	0.13	15	EKRE350E□□4R7MD05D
	6.8	5×5	0.13	20	EKRE350E□□6R8ME05D
	10	5×5	0.13	25	EKRE350E□□100ME05D
	15	6.3×5	0.13	33	EKRE350E□□150MF05D
	22	6.3×5	0.13	40	EKRE350E□□220MF05D
50	0.10	4×5	0.11	1.3	EKRE500E□□R10MD05D
	0.15	4×5	0.11	2.0	EKRE500E□□R15MD05D
	0.22	4×5	0.11	2.6	EKRE500E□□R22MD05D
	0.33	4×5	0.11	3.2	EKRE500E□□R33MD05D
	0.47	4×5	0.11	3.8	EKRE500E□□R47MD05D
	0.68	4×5	0.11	4.6	EKRE500E□□R68MD05D
	1.0	4×5	0.11	5.6	EKRE500E□□1R0MD05D
	1.5	4×5	0.11	6.9	EKRE500E□□1R5MD05D
	2.2	4×5	0.11	10	EKRE500E□□2R2MD05D
	3.3	4×5	0.11	14	EKRE500E□□3R3MD05D
	4.7	5×5	0.11	19	EKRE500E□□4R7ME05D
	6.8	6.3×5	0.11	24	EKRE500E□□6R8MF05D
	10	6.3×5	0.11	29	EKRE500E□□100MF05D

□□ : Fill with appropriate lead forming or taping code.
Note : ▭ had been unified to φ4×5.

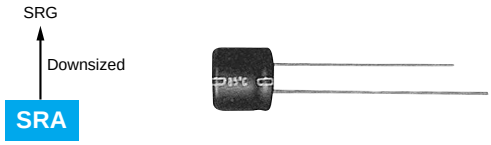
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

7mm height, 85℃

SRA Series

- ●7mm height
- ●Endurance : 1,000 hours at 85℃
- ●Non solvent-proof type
- ●**RoHS Compliant**

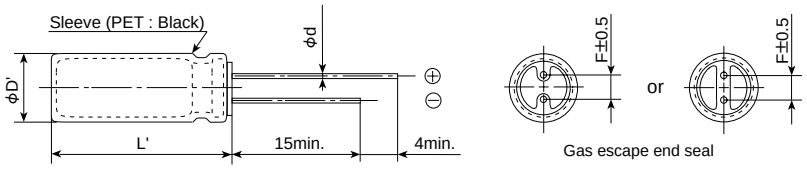


◆SPECIFICATIONS

Items	Characteristics									
Category Temperature Range	−40 to +85℃									
Rated Voltage Range	4 to 63Vdc									
Capacitance Tolerance	±20% (M)									(at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)									(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	4V	6.3V	10V	16V	25V	35V	50V	63V	
	tanδ (Max.)	0.35	0.24	0.20	0.16	0.14	0.12	0.10	0.08	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	4V	6.3V	10V	16V	25V	35V	50V	63V	
	Z(−25℃)/Z(+20℃)	4	4	3	2	2	2	2	2	
	Z(−40℃)/Z(+20℃)	10	10	8	6	4	3	3	3	(at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 1,000 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								

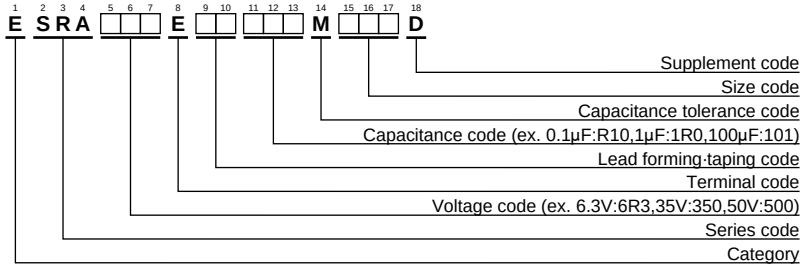
◆DIMENSIONS [mm]

●Terminal Code : E



φD	4	5	6.3	8
φd	0.45	0.45	0.45	0.45
F	1.5	2.0	2.5	3.5
φD'	φD+0.5max.			
L'	L+1.0max.			

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

7mm height, 85℃

SRA Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
4	33	4X7	0.35	26	ESRA4R0E□□330MD07D
	47	4X7	0.35	34	ESRA4R0E□□470MD07D
	100	5X7	0.35	61	ESRA4R0E□□101ME07D
	220	6.3X7	0.35	95	ESRA4R0E□□221MF07D
	470	8X7	0.35	154	ESRA4R0E□□471MH07D
6.3	22	4X7	0.24	31	ESRA6R3E□□220MD07D
	47	5X7	0.24	47	ESRA6R3E□□470ME07D
	330	8X7	0.24	156	ESRA6R3E□□331MH07D
10	33	5X7	0.20	43	ESRA100E□□330ME07D
	100	6.3X7	0.20	80	ESRA100E□□101MF07D
	220	8X7	0.20	140	ESRA100E□□221MH07D
16	10	4X7	0.16	25	ESRA160E□□100MD07D
	22	5X7	0.16	39	ESRA160E□□220ME07D
	47	6.3X7	0.16	59	ESRA160E□□470MF07D
	100	6.3X7	0.16	97	ESRA160E□□101MF07D
25	33	6.3X7	0.14	53	ESRA250E□□330MF07D
	47	6.3X7	0.14	71	ESRA250E□□470MF07D
35	4.7	4X7	0.12	20	ESRA350E□□4R7MD07D
	10	5X7	0.12	30	ESRA350E□□100ME07D
	22	6.3X7	0.12	47	ESRA350E□□220MF07D
	33	6.3X7	0.12	64	ESRA350E□□330MF07D
	47	8X7	0.12	83	ESRA350E□□470MH07D

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
50	0.10	4X7	0.10	1.3	ESRA500E□□R10MD07D
	0.22	4X7	0.10	2.9	ESRA500E□□R22MD07D
	0.33	4X7	0.10	3.5	ESRA500E□□R33MD07D
	0.47	4X7	0.10	5.0	ESRA500E□□R47MD07D
	1.0	4X7	0.10	10	ESRA500E□□1R0MD07D
	2.2	4X7	0.10	15	ESRA500E□□2R2MD07D
	3.3	4X7	0.10	18	ESRA500E□□3R3MD07D
	4.7	5X7	0.10	23	ESRA500E□□4R7ME07D
	10	6.3X7	0.10	34	ESRA500E□□100MF07D
	22	6.3X7	0.10	57	ESRA500E□□220MF07D
	33	8X7	0.10	76	ESRA500E□□330MH07D
63	0.10	4X7	0.08	1.3	ESRA630E□□R10MD07D
	0.22	4X7	0.08	2.9	ESRA630E□□R22MD07D
	0.33	4X7	0.08	4.4	ESRA630E□□R33MD07D
	0.47	4X7	0.08	7.9	ESRA630E□□R47MD07D
	1.0	4X7	0.08	11	ESRA630E□□1R0MD07D
	2.2	4X7	0.08	17	ESRA630E□□2R2MD07D
	3.3	5X7	0.08	21	ESRA630E□□3R3ME07D
	4.7	6.3X7	0.08	26	ESRA630E□□4R7MF07D
	10	6.3X7	0.08	47	ESRA630E□□100MF07D

□□ : Fill with appropriate lead forming or taping code.

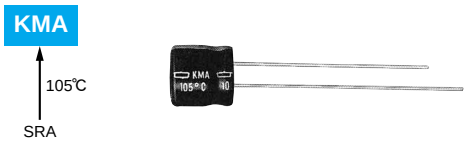
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

7mm height, 105℃

KMA Series

- 7mm height
- Endurance : 1,000 hours at 105℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

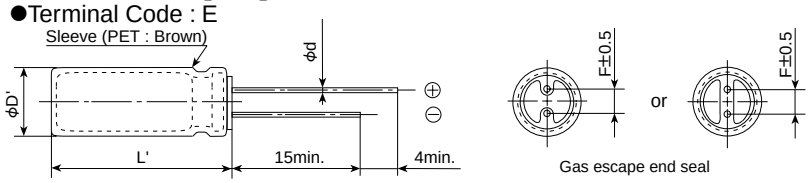


◆SPECIFICATIONS

Items	Characteristics									
Category Temperature Range	−55 to +105℃									
Rated Voltage Range	4 to 63Vdc									
Capacitance Tolerance	±20% (M)									(at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)									(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	4V	6.3V	10V	16V	25V	35V	50V	63V	
	tanδ (Max.)	0.35	0.22	0.19	0.16	0.14	0.12	0.10	0.08	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	4V	6.3V	10V	16V	25V	35V	50V	63V	
	Z(−25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	
	Z(−40℃)/Z(+20℃)	10	6	5	3	3	3	3	3	(at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 1,000 hours at 105℃.									
	Rated voltage	4 to 16Vdc				25 to 63Vdc				
	Capacitance change	≦±25% of the initial value				≦±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	4 to 16Vdc				25 to 63Vdc				
	Capacitance change	≦±25% of the initial value				≦±20% of the initial value				
	D.F. (tanδ)	≦200% of the initial specified value								
	Leakage current	≦The initial specified value								

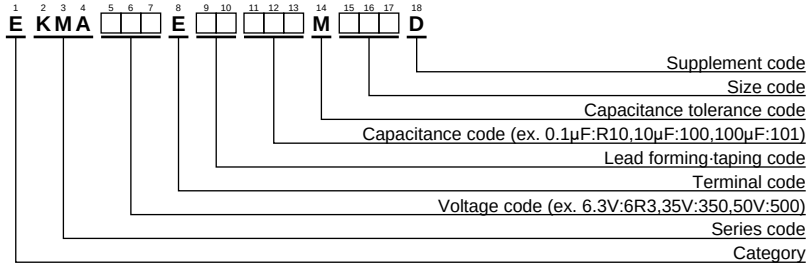
◆DIMENSIONS [mm]

●Terminal Code : E



φD	4	5	6.3
φd	0.45	0.45	0.45
F	1.5	2.0	2.5
φD'	φD+0.5max.		
L'	L+1.0max.		

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

7mm height, 105℃

KMA Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 105℃,120Hz)	Part No.
4	33	4X7	0.35	26	EKMA4R0E□□330MD07D
	47	4X7	0.35	34	EKMA4R0E□□470MD07D
	100	5X7	0.35	61	EKMA4R0E□□101ME07D
	220	6.3X7	0.35	95	EKMA4R0E□□221MF07D
6.3	22	4X7	0.22	31	EKMA6R3E□□220MD07D
	47	5X7	0.22	47	EKMA6R3E□□470ME07D
10	15	4X7	0.19	28	EKMA100E□□150MD07D
	33	5X7	0.19	43	EKMA100E□□330ME07D
	68	6.3X7	0.19	63	EKMA100E□□680MF07D
	100	6.3X7	0.19	80	EKMA100E□□101MF07D
16	6.8	4X7	0.16	20	EKMA160E□□6R8MD07D
	10	4X7	0.16	25	EKMA160E□□100MD07D
	15	5X7	0.16	31	EKMA160E□□150ME07D
	22	5X7	0.16	39	EKMA160E□□220ME07D
	47	6.3X7	0.16	59	EKMA160E□□470MF07D
	100	6.3X7	0.16	97	EKMA160E□□101MF07D
25	33	6.3X7	0.14	53	EKMA250E□□330MF07D
	47	6.3X7	0.14	71	EKMA250E□□470MF07D
35	4.7	4X7	0.12	20	EKMA350E□□4R7MD07D
	6.8	5X7	0.12	24	EKMA350E□□6R8ME07D
	10	5X7	0.12	30	EKMA350E□□100ME07D
	15	6.3X7	0.12	37	EKMA350E□□150MF07D
	22	6.3X7	0.12	47	EKMA350E□□220MF07D
	33	6.3X7	0.12	64	EKMA350E□□330MF07D

□□ : Fill with appropriate lead forming or taping code.

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 105℃,120Hz)	Part No.
50	0.10	4X7	0.10	1.3	EKMA500E□□R10MD07D
	0.15	4X7	0.10	2.0	EKMA500E□□R15MD07D
	0.22	4X7	0.10	2.9	EKMA500E□□R22MD07D
	0.33	4X7	0.10	3.5	EKMA500E□□R33MD07D
	0.47	4X7	0.10	5.0	EKMA500E□□R47MD07D
	0.68	4X7	0.10	7.1	EKMA500E□□R68MD07D
	1.0	4X7	0.10	10	EKMA500E□□1R0MD07D
	1.5	4X7	0.10	12	EKMA500E□□1R5MD07D
	2.2	4X7	0.10	15	EKMA500E□□2R2MD07D
	3.3	4X7	0.10	18	EKMA500E□□3R3MD07D
	4.7	5X7	0.10	23	EKMA500E□□4R7ME07D
	6.8	6.3X7	0.10	28	EKMA500E□□6R8MF07D
	10	6.3X7	0.10	34	EKMA500E□□100MF07D
	22	6.3X7	0.10	57	EKMA500E□□220MF07D
63	0.10	4X7	0.08	1.3	EKMA630E□□R10MD07D
	0.15	4X7	0.08	1.9	EKMA630E□□R15MD07D
	0.22	4X7	0.08	2.9	EKMA630E□□R22MD07D
	0.33	4X7	0.08	4.4	EKMA630E□□R33MD07D
	0.47	4X7	0.08	7.9	EKMA630E□□R47MD07D
	0.68	4X7	0.08	9.2	EKMA630E□□R68MD07D
	1.0	4X7	0.08	11	EKMA630E□□1R0MD07D
	1.5	4X7	0.08	13	EKMA630E□□1R5MD07D
	2.2	4X7	0.08	17	EKMA630E□□2R2MD07D
	3.3	5X7	0.08	21	EKMA630E□□3R3ME07D
	4.7	6.3X7	0.08	26	EKMA630E□□4R7MF07D
	10	6.3X7	0.08	43	EKMA630E□□100MF07D

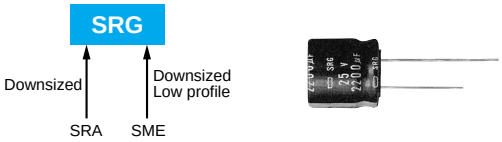
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low profile, 85℃

SRG Series

- Low profile : φ4×7mm to φ18×25mm
- Endurance : 1,000 to 2,000 hours at 85℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

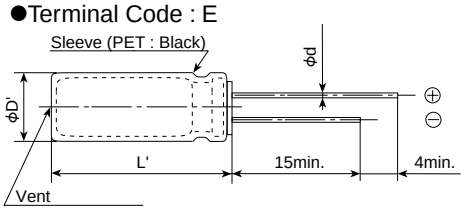


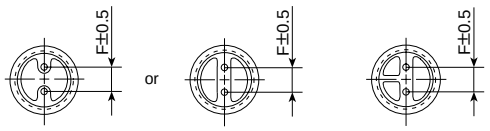
◆SPECIFICATIONS

Items	Characteristics							
Category Temperature Range	−40 to +85℃							
Rated Voltage Range	4 to 50Vdc							
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)							
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)							
Dissipation Factor (tanδ)	Rated voltage (Vdc)	4V	6.3V	10V	16V	25V	35V	50V
	tanδ (Max.)	0.38	0.28	0.24	0.20	0.16	0.14	0.12
	When nominal capacitance exceeds 1,000μF, add 0.03 to the value above for each 1,000μF increase. (at 20℃, 120Hz)							
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	4V	6.3V	10V	16V	25V	35V	50V
	Z(−25℃)/Z(+20℃)	6	5	4	3	2	2	2
	Z(−40℃)/Z(+20℃)	12	12	10	8	5	4	3
	(at 120Hz)							
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 2,000 hours (1,000 hours for φ8 and smaller) 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 [mm]

- Terminal Code : E





φD		4	5	6.3	8	10 & 12.5	16 & 18
φd	7L	0.45	0.45	0.45	0.45	—	—
	≧9L	–	0.5	0.5	0.6	0.6	0.8
F		1.5	2.0	2.5	3.5	5.0	7.5
φD'		φD+0.5max.					
L'		L+1.5max. (7L : L+1.0max.)					

◆PART NUMBERING SYSTEM

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

Supplement code
Size code
Capacitance tolerance code
Capacitance code (ex. 0.1μF:R10, 100μF:101, 2,200μF:222)
Lead forming·taping code
Terminal code
Voltage code (ex. 6.3V:6R3, 35V:350, 50V:500)
Series code
Category

Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low profile, 85℃

SRG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case code φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
4	470	8×7	0.38	154	ESRG4R0E□□471MH07D
6.3	47	4×7	0.28	50	ESRG6R3E□□470MD07D
	100	5×7	0.28	87	ESRG6R3E□□101ME07D
	220	6.3×7	0.28	133	ESRG6R3E□□221MF07D
	330	6.3×9	0.28	247	ESRG6R3E□□331MF09D
	330	8×7	0.28	191	ESRG6R3E□□331MH07D
	1,000	10×9	0.28	505	ESRG6R3E□□102MJ09S
	4,700	16×15	0.37	1,410	ESRG6R3E□□472ML15S
	6,800	18×15	0.43	1,660	ESRG6R3E□□682MM15S
	10,000	18×20	0.55	2,020	ESRG6R3E□□103MM20S
10	33	4×7	0.24	46	ESRG100E□□330MD07D
	100	5×9	0.24	132	ESRG100E□□101ME09D
	220	6.3×9	0.24	218	ESRG100E□□221MF09D
	220	8×7	0.24	171	ESRG100E□□221MH07D
	470	8×9	0.24	385	ESRG100E□□471MH09D
	1,000	10×12.5	0.24	625	ESRG100E□□102MJC5S
	2,200	12.5×15	0.27	970	ESRG100E□□222MK15S
	3,300	16×15	0.30	1,310	ESRG100E□□332ML15S
	4,700	18×15	0.33	1,560	ESRG100E□□472MM15S
	6,800	18×20	0.39	1,870	ESRG100E□□682MM20S
	10,000	18×25	0.51	2,370	ESRG100E□□103MM25S
16	22	4×7	0.20	42	ESRG160E□□220MD07D
	47	5×7	0.20	73	ESRG160E□□470ME07D
	100	6.3×7	0.20	110	ESRG160E□□101MF07D
	220	8×9	0.20	290	ESRG160E□□221MH09D
	330	8×9	0.20	355	ESRG160E□□331MH09D
	470	10×9	0.20	410	ESRG160E□□471MJ09S
	1,000	12.5×13	0.20	715	ESRG160E□□102MK13S
	2,200	16×15	0.23	1,160	ESRG160E□□222ML15S
	3,300	18×15	0.26	1,460	ESRG160E□□332MM15S
	4,700	18×20	0.29	1,770	ESRG160E□□472MM20S
	6,800	18×25	0.35	2,170	ESRG160E□□682MM25S
25	33	5×7	0.16	66	ESRG250E□□330ME07D
	47	5×9	0.16	105	ESRG250E□□470ME09D
	47	6.3×7	0.16	80	ESRG250E□□470MF07D
	100	6.3×9	0.16	172	ESRG250E□□101MF09D
	330	10×9	0.16	380	ESRG250E□□331MJ09S
	470	10×12.5	0.16	525	ESRG250E□□471MJC5S
	1,000	12.5×15	0.16	830	ESRG250E□□102MK15S

WV (Vdc)	Cap (μF)	Case code φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
25	2,200	18×15	0.19	1,360	ESRG250E□□222MM15S
	3,300	18×20	0.22	1,720	ESRG250E□□332MM20S
	4,700	18×25	0.25	2,070	ESRG250E□□472MM25S
35	10	4×7	0.14	32	ESRG350E□□100MD07D
	22	5×7	0.14	57	ESRG350E□□220ME07D
	33	5×9	0.14	94	ESRG350E□□330ME09D
	33	6.3×7	0.14	73	ESRG350E□□330MF07D
	47	8×7	0.14	101	ESRG350E□□470MH07D
	100	8×9	0.14	220	ESRG350E□□101MH09D
	220	10×9	0.14	335	ESRG350E□□221MJ09S
	330	10×12.5	0.14	475	ESRG350E□□331MJC5S
	470	12.5×13	0.14	585	ESRG350E□□471MK13S
	1,000	16×15	0.14	1,010	ESRG350E□□102ML15S
	2,200	18×20	0.17	1,560	ESRG350E□□222MM20S
50	0.10	4×7	0.12	1.3	ESRG500E□□R10MD07D
	0.22	4×7	0.12	2.9	ESRG500E□□R22MD07D
	0.33	4×7	0.12	3.5	ESRG500E□□R33MD07D
	0.47	4×7	0.12	5.0	ESRG500E□□R47MD07D
	1.0	4×7	0.12	10	ESRG500E□□1R0MD07D
	1.0	5×9	0.12	13	ESRG500E□□1R0ME09D
	2.2	4×7	0.12	15	ESRG500E□□2R2MD07D
	2.2	5×9	0.12	26	ESRG500E□□2R2ME09D
	3.3	4×7	0.12	19	ESRG500E□□3R3MD07D
	3.3	5×9	0.12	32	ESRG500E□□3R3ME09D
	4.7	4×7	0.12	24	ESRG500E□□4R7MD07D
	4.7	5×9	0.12	38	ESRG500E□□4R7ME09D
	10	5×7	0.12	42	ESRG500E□□100ME07D
	10	5×9	0.12	64	ESRG500E□□100ME09D
	22	5×9	0.12	86	ESRG500E□□220ME09D
	22	6.3×7	0.12	64	ESRG500E□□220MF07D
	33	6.3×9	0.12	113	ESRG500E□□330MF09D
	33	8×7	0.12	93	ESRG500E□□330MH07D
	47	6.3×9	0.12	135	ESRG500E□□470MF09D
	100	10×9	0.12	240	ESRG500E□□101MJ09S
	220	10×12.5	0.12	415	ESRG500E□□221MJC5S
	330	12.5×13	0.12	525	ESRG500E□□331MK13S
	470	16×15	0.12	745	ESRG500E□□471ML15S
	1,000	18×20	0.12	1,160	ESRG500E□□102MM20S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	50	120	300	1k	10k	100k
to 4.7	0.65	1.00	1.35	1.75	2.30	2.50
10 to 47	0.75	1.00	1.25	1.50	1.75	1.80
100 to 1,000	0.80	1.00	1.15	1.30	1.40	1.50
2,200 to	0.85	1.00	1.03	1.05	1.08	1.08

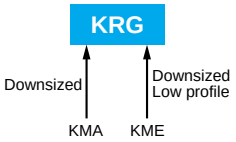
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low profile, 105℃

KRG Series

- Low profile : φ4×7mm to φ18×25mm
- Endurance : 1,000 hours at 105℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

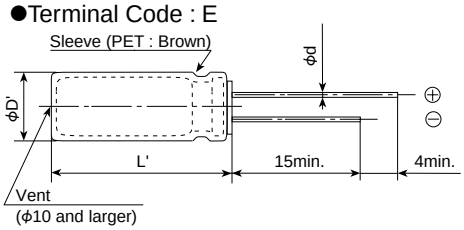


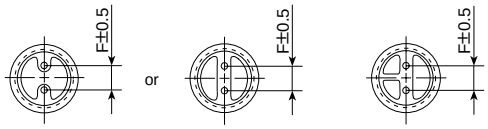
◆SPECIFICATIONS

Items	Characteristics						
Category Temperature Range	−55 to +105℃						
Rated Voltage Range	6.3 to 50Vdc						
Capacitance Tolerance	±20% (M)						(at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)						(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V
	tanδ (Max.)	0.28	0.24	0.20	0.16	0.14	0.12
	When nominal capacitance exceeds 1,000μF, add 0.03 to the value above for each 1,000μF increase.						(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V
	Z(−25℃)/Z(+20℃)	5	4	3	2	2	2
	Z(−40℃)/Z(+20℃)	10	8	6	4	3	3 (at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 1,000 hours at 105℃.						
	Rated voltage	6.3 to 16Vdc				25 to 50Vdc	
	Capacitance change	≦±25% of the initial value				≦±20% of the initial value	
	D.F. (tanδ)	≦200% of the initial specified value				≦200% of the initial specified value	
	Leakage current	≦The initial specified value				≦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.						
	Rated voltage	6.3 to 16Vdc				25 to 50Vdc	
	Capacitance change	≦±25% of the initial value				≦±20% of the initial value	
	D.F. (tanδ)	≦200% of the initial specified value				≦200% of the initial specified value	
	Leakage current	≦The initial specified value				≦The initial specified value	

◆DIMENSIONS [mm]

- Terminal Code : E





φD		4	5	6.3	8	10 & 12.5	16 & 18
φd	7L	0.45	0.45	0.45	–	—	—
	≧9L	–	0.5	0.5	0.6	0.6	0.8
F		1.5	2.0	2.5	3.5	5.0	7.5
φD'		φD+0.5max.					
L'		L+1.5max. (7L : L+1.0max.)					

◆PART NUMBERING SYSTEM

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

- Supplement code
- Size code
- Capacitance tolerance code
- Capacitance code (ex. 0.1μF:R10, 10μF:100, 1,000μF:102)
- Lead forming·taping code
- Terminal code
- Voltage code (ex. 6.3V:6R3, 35V:350, 50V:500)
- Series code
- Category

Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low profile, 105℃

KRG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
6.3	47	5X7	0.28	50	EKRG6R3E□□470ME07D
	330	6.3X9	0.28	175	EKRG6R3E□□331MF09D
	1,000	10X9	0.28	365	EKRG6R3E□□102MJ09S
	4,700	16X15	0.37	1,010	EKRG6R3E□□472ML15S
	6,800	18X15	0.43	1,190	EKRG6R3E□□682MM15S
	10,000	18X20	0.55	1,440	EKRG6R3E□□103MM20S
10	22	4X7	0.24	35	EKRG100E□□220MD07D
	100	5X9	0.24	93	EKRG100E□□101ME09D
	100	6.3X7	0.24	80	EKRG100E□□101MF07D
	220	6.3X9	0.24	154	EKRG100E□□221MF09D
	470	8X9	0.24	272	EKRG100E□□471MH09D
	1,000	10X12.5	0.24	445	EKRG100E□□102MJC5S
	2,200	12.5X15	0.27	690	EKRG100E□□222MK15S
	3,300	16X15	0.30	940	EKRG100E□□332ML15S
	4,700	18X15	0.33	1,120	EKRG100E□□472MM15S
	6,800	18X20	0.39	1,330	EKRG100E□□682MM20S
	10,000	18X25	0.51	1,700	EKRG100E□□103MM25S
16	33	5X7	0.20	53	EKRG160E□□330ME07D
	47	6.3X7	0.20	68	EKRG160E□□470MF07D
	100	6.3X7	0.20	97	EKRG160E□□101MF07D
	220	8X9	0.20	205	EKRG160E□□221MH09D
	330	8X9	0.20	251	EKRG160E□□331MH09D
	470	10X9	0.20	290	EKRG160E□□471MJ09S
	1,000	12.5X13	0.20	515	EKRG160E□□102MK13S
	2,200	16X15	0.23	830	EKRG160E□□222ML15S
	3,300	18X15	0.26	1,050	EKRG160E□□332MM15S
	4,700	18X20	0.29	1,260	EKRG160E□□472MM20S
	6,800	18X25	0.35	1,560	EKRG160E□□682MM25S
25	10	4X7	0.16	30	EKRG250E□□100MD07D
	22	5X7	0.16	46	EKRG250E□□220ME07D
	33	6.3X7	0.16	63	EKRG250E□□330MF07D
	47	5X9	0.16	75	EKRG250E□□470ME09D
	47	6.3X7	0.16	71	EKRG250E□□470MF07D
	100	6.3X9	0.16	121	EKRG250E□□101MF09D
	330	10X9	0.16	270	EKRG250E□□331MJ09S
	470	10X12.5	0.16	370	EKRG250E□□471MJC5S
	1,000	12.5X15	0.16	590	EKRG250E□□102MK15S

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
25	2,200	18X15	0.19	970	EKRG250E□□222MM15S
	3,300	18X20	0.22	1,220	EKRG250E□□332MM20S
	4,700	18X25	0.25	1,470	EKRG250E□□472MM25S
35	10	5X7	0.14	36	EKRG350E□□100ME07D
	22	6.3X7	0.14	57	EKRG350E□□220MF07D
	33	5X9	0.14	67	EKRG350E□□330ME09D
	33	6.3X7	0.14	64	EKRG350E□□330MF07D
	100	8X9	0.14	155	EKRG350E□□101MH09D
	220	10X9	0.14	235	EKRG350E□□221MJ09S
	330	10X12.5	0.14	340	EKRG350E□□331MJC5S
	470	12.5X13	0.14	415	EKRG350E□□471MK13S
	1,000	16X15	0.14	720	EKRG350E□□102ML15S
	2,200	18X20	0.17	1,110	EKRG350E□□222MM20S
50	0.10	4X7	0.12	1.3	EKRG500E□□R10MD07D
	0.22	4X7	0.12	2.9	EKRG500E□□R22MD07D
	0.33	4X7	0.12	3.5	EKRG500E□□R33MD07D
	0.47	4X7	0.12	5.0	EKRG500E□□R47MD07D
	1.0	4X7	0.12	10	EKRG500E□□1R0MD07D
	1.0	5X9	0.12	12	EKRG500E□□1R0ME09D
	2.2	4X7	0.12	15	EKRG500E□□2R2MD07D
	2.2	5X9	0.12	18	EKRG500E□□2R2ME09D
	3.3	4X7	0.12	18	EKRG500E□□3R3MD07D
	3.3	5X9	0.12	22	EKRG500E□□3R3ME09D
	4.7	4X7	0.12	25	EKRG500E□□4R7MD07D
	4.7	5X9	0.12	27	EKRG500E□□4R7ME09D
	10	5X9	0.12	46	EKRG500E□□100ME09D
	10	6.3X7	0.12	44	EKRG500E□□100MF07D
	22	5X9	0.12	61	EKRG500E□□220ME09D
	22	6.3X7	0.12	57	EKRG500E□□220MF07D
	33	6.3X9	0.12	80	EKRG500E□□330MF09D
	47	6.3X9	0.12	95	EKRG500E□□470MF09D
	100	10X9	0.12	170	EKRG500E□□101MJ09S
	220	10X12.5	0.12	290	EKRG500E□□221MJC5S
	330	12.5X13	0.12	370	EKRG500E□□331MK13S
	470	16X15	0.12	535	EKRG500E□□471ML15S
	1,000	18X20	0.12	830	EKRG500E□□102MM20S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	50	120	300	1k	10k	100k
0.1 to 4.7	0.65	1.00	1.35	1.75	2.30	2.50
10 to 47	0.75	1.00	1.25	1.50	1.75	1.80
100 to 1,000	0.80	1.00	1.15	1.30	1.40	1.50
2,200 to	0.85	1.00	1.03	1.05	1.08	1.08

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85℃

SMQ Series

- Downsized from current standard SMG series
- Endurance : 2,000 hours at 85℃
- Non Solvent-proof type
- **RoHS Compliant**

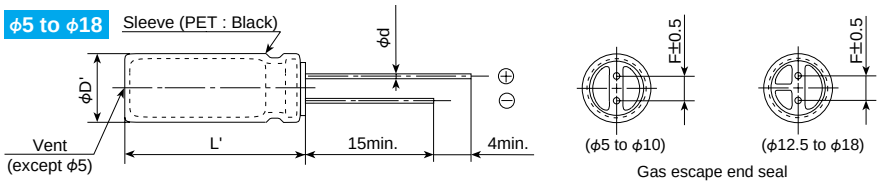
SMQ
↑ Downsized
SMG

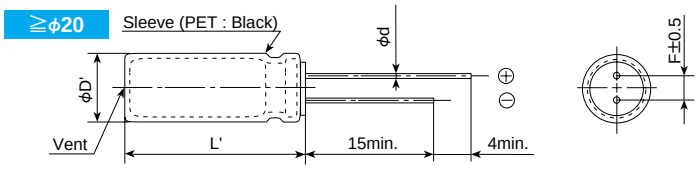
◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−40 to +85℃(6.3 to 400Vdc)　−25 to +85℃(450Vdc)
Rated Voltage Range	6.3 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	6.3 to 100Vdc / 160 to 450Vdc ≦ϕ18: I=0.03CV or 4μA, whichever is greater. (at 20C after 1 minute) CV \ Time: After 1minute CV≦1,000: I=0.1CV+40 max. CV>1,000: I=0.04CV+100 max. (at 20℃) ≧ϕ20: I=0.03CV (at 20℃ after 3 minutes) Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)
Dissipation Factor (tanδ)	Rated voltage (Vdc): 6.3V / 10V / 16V / 25V / 35V / 50V / 63V / 100V / 160 to 250V / 315 to 400V / 450V tanδ (Max.): 0.28 / 0.24 / 0.20 / 0.16 / 0.14 / 0.12 / 0.09 / 0.08 / 0.20 / 0.24 / 0.24 When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc): 6.3V / 10V / 16V / 25V / 35V / 50V / 63V / 100V / 160 to 200V / 250V / 350V / 400V / 450V Z(−25℃)/Z(+20℃) ≦ϕ8: 5 / 4 / 3 / 2 / 2 / 2 / 2 / 2 / 3 / 3 / 4 / 4 / 6 Z(−25℃)/Z(+20℃) ≧ϕ10: 5 / 4 / 3 / 2 / 2 / 2 / 2 / 2 / 3 / 3 / 4 / 4 / 6 Z(−40℃)/Z(+20℃) ≦ϕ8: 12 / 10 / 8 / 5 / 4 / 3 / 3 / 3 / 8 / 10 / 8 / 8 / — Z(−40℃)/Z(+20℃) ≧ϕ10: 12 / 10 / 8 / 5 / 4 / 3 / 3 / 3 / 4 / 4 / 6 / 6 / — (at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage 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 1,000 hours at 85℃ without voltage applied. Rated voltage: 6.3 to 100Vdc / 160 to 450Vdc Capacitance change: ≦±20% of the initial value / ≦±20% of the initial value D.F. (tanδ): ≦200% of the initial specified value / ≦200% of the initial specified value Leakage current: ≦The initial specified value / ≦500% of the initial specified value

◆DIMENSIONS [mm]

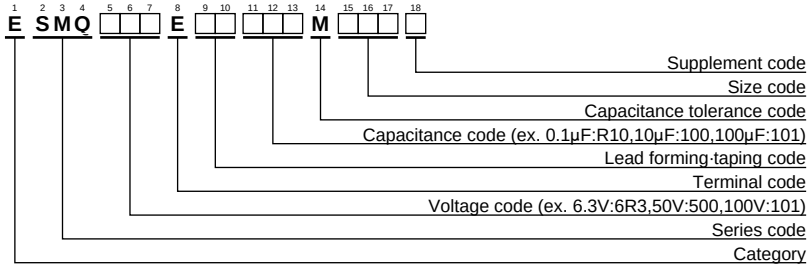
- Terminal Code : E





ϕD	5	6.3	8	10	12.5	16	18	20	22
ϕd	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	10.0
ϕD'	ϕD+0.5max.							ϕD+0.5max.	
L'	L+1.5max.							L+2.0max.	

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85℃

SMQ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
6.3	1,000	8×11.5	0.28	540	ESMQ6R3E□□102MHB5D
	2,200	10×16	0.30	890	ESMQ6R3E□□222MJ16S
	3,300	10×20	0.32	1,190	ESMQ6R3E□□332MJ20S
	4,700	12.5×20	0.34	1,550	ESMQ6R3E□□472MK20S
	6,800	12.5×25	0.38	1,920	ESMQ6R3E□□682MK25S
	10,000	16×25	0.46	2,350	ESMQ6R3E□□103ML25S
	15,000	16×31.5	0.56	2,550	ESMQ6R3E□□153MLN3S
	22,000	18×35.5	0.70	3,200	ESMQ6R3E□□223MMP1S
	33,000	20×40	0.92	3,500	ESMQ6R3E□□333MN40S
	47,000	22×50	1.20	3,900	ESMQ6R3E□□473MP50S
10	220	5×11	0.24	240	ESMQ100E□□221ME11D
	330	6.3×11	0.24	290	ESMQ100E□□331MF11D
	470	6.3×11	0.24	350	ESMQ100E□□471MF11D
	1,000	10×12.5	0.24	650	ESMQ100E□□102MJC5S
	2,200	10×16	0.26	990	ESMQ100E□□222MJ16S
	3,300	12.5×20	0.28	1,450	ESMQ100E□□332MK20S
	4,700	12.5×25	0.30	1,800	ESMQ100E□□472MK25S
	6,800	16×25	0.34	2,250	ESMQ100E□□682ML25S
	10,000	16×31.5	0.42	2,550	ESMQ100E□□103MLN3S
	15,000	16×35.5	0.52	2,880	ESMQ100E□□153MLP1S
	22,000	18×40	0.66	3,400	ESMQ100E□□223MM40S
	33,000	22×50	0.88	4,500	ESMQ100E□□333MP50S
16	220	6.3×11	0.20	260	ESMQ160E□□221MF11D
	330	6.3×11	0.20	320	ESMQ160E□□331MF11D
	470	8×11.5	0.20	440	ESMQ160E□□471MHB5D
	1,000	10×12.5	0.20	700	ESMQ160E□□102MJC5S
	2,200	10×20	0.22	1,000	ESMQ160E□□222MJ20S
	3,300	12.5×25	0.24	1,700	ESMQ160E□□332MK25S
	4,700	16×25	0.26	2,100	ESMQ160E□□472ML25S
	6,800	16×25	0.30	2,250	ESMQ160E□□682ML25S
	10,000	16×35.5	0.38	2,710	ESMQ160E□□103MLP1S
	15,000	18×40	0.48	3,100	ESMQ160E□□153MM40S
	22,000	22×40	0.62	3,800	ESMQ160E□□223MP40S
25	100	5×11	0.16	180	ESMQ250E□□101ME11D
	220	6.3×11	0.16	280	ESMQ250E□□221MF11D
	330	8×11.5	0.16	440	ESMQ250E□□331MHB5D
	470	10×12.5	0.16	550	ESMQ250E□□471MJC5S
	1,000	10×16	0.16	860	ESMQ250E□□102MJ16S
	2,200	12.5×25	0.18	1,550	ESMQ250E□□222MK25S
	3,300	16×25	0.20	1,980	ESMQ250E□□332ML25S
	4,700	16×25	0.22	2,200	ESMQ250E□□472ML25S
	6,800	16×35.5	0.26	2,600	ESMQ250E□□682MLP1S
	10,000	18×40	0.34	2,800	ESMQ250E□□103MM40S
	15,000	22×50	0.44	3,800	ESMQ250E□□153MP50S
35	47	5×11	0.14	130	ESMQ350E□□470ME11D
	68	6.3×11	0.14	160	ESMQ350E□□680MF11D
	100	6.3×11	0.14	210	ESMQ350E□□101MF11D
	220	8×11.5	0.14	385	ESMQ350E□□221MHB5D
	330	10×12.5	0.14	490	ESMQ350E□□331MJC5S
	470	10×16	0.14	650	ESMQ350E□□471MJ16S
	1,000	12.5×20	0.14	1,150	ESMQ350E□□102MK20S
	2,200	16×25	0.16	1,800	ESMQ350E□□222ML25S
	3,300	16×31.5	0.18	2,100	ESMQ350E□□332MLN3S
	4,700	16×35.5	0.20	2,500	ESMQ350E□□472MLP1S
	6,800	18×40	0.24	2,800	ESMQ350E□□682MM40S
	10,000	22×50	0.32	3,700	ESMQ350E□□103MP50S
50	0.10	5×11	0.12	1.3	ESMQ500E□□R10ME11D
	0.22	5×11	0.12	2.9	ESMQ500E□□R22ME11D
	0.33	5×11	0.12	4.3	ESMQ500E□□R33ME11D
	0.47	5×11	0.12	6.2	ESMQ500E□□R47ME11D
	1.0	5×11	0.12	17	ESMQ500E□□1R0ME11D
	2.2	5×11	0.12	28	ESMQ500E□□2R2ME11D
	3.3	5×11	0.12	35	ESMQ500E□□3R3ME11D
	4.7	5×11	0.12	41	ESMQ500E□□4R7ME11D
	10	5×11	0.12	60	ESMQ500E□□100ME11D
	22	5×11	0.12	95	ESMQ500E□□220ME11D
	33	5×11	0.12	125	ESMQ500E□□330ME11D

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
50	47	6.3×11	0.12	155	ESMQ500E□□470MF11D
	68	6.3×11	0.12	210	ESMQ500E□□680MF11D
	100	8×11.5	0.12	260	ESMQ500E□□101MHB5D
	220	10×12.5	0.12	430	ESMQ500E□□221MJC5S
	330	10×16	0.12	590	ESMQ500E□□331MJ16S
	470	10×20	0.12	760	ESMQ500E□□471MJ20S
	1,000	12.5×25	0.12	1,350	ESMQ500E□□102MK25S
	2,200	16×31.5	0.14	1,980	ESMQ500E□□222MLN3S
	3,300	18×35.5	0.16	2,500	ESMQ500E□□332MMP1S
	4,700	20×40	0.18	2,900	ESMQ500E□□472MN40S
	6,800	22×50	0.22	3,500	ESMQ500E□□682MP50S
63	22	5×11	0.09	100	ESMQ630E□□220ME11D
	33	6.3×11	0.09	140	ESMQ630E□□330MF11D
	47	6.3×11	0.09	170	ESMQ630E□□470MF11D
	68	8×11.5	0.09	220	ESMQ630E□□680MHB5D
	100	8×11.5	0.09	280	ESMQ630E□□101MHB5D
	220	10×16	0.09	490	ESMQ630E□□221MJ16S
	330	10×20	0.09	710	ESMQ630E□□331MJ20S
	470	12.5×20	0.09	900	ESMQ630E□□471MK20S
	1,000	16×25	0.09	1,300	ESMQ630E□□102ML25S
	2,200	18×35.5	0.11	2,300	ESMQ630E□□222MMP1S
	3,300	20×40	0.13	2,700	ESMQ630E□□332MN40S
	4,700	22×50	0.15	3,400	ESMQ630E□□472MP50S
100	0.10	5×11	0.08	2.1	ESMQ101E□□R10ME11D
	0.22	5×11	0.08	4.7	ESMQ101E□□R22ME11D
	0.33	5×11	0.08	7.0	ESMQ101E□□R33ME11D
	0.47	5×11	0.08	10	ESMQ101E□□R47ME11D
	1.0	5×11	0.08	21	ESMQ101E□□1R0ME11D
	2.2	5×11	0.08	30	ESMQ101E□□2R2ME11D
	3.3	5×11	0.08	40	ESMQ101E□□3R3ME11D
	4.7	5×11	0.08	45	ESMQ101E□□4R7ME11D
	10	5×11	0.08	70	ESMQ101E□□100ME11D
	22	6.3×11	0.08	130	ESMQ101E□□220MF11D
	33	8×11.5	0.08	180	ESMQ101E□□330MHB5D
	47	8×11.5	0.08	200	ESMQ101E□□470MHB5D
	68	10×12.5	0.08	270	ESMQ101E□□680MJC5S
	100	10×16	0.08	340	ESMQ101E□□101MJ16S
	220	12.5×20	0.08	550	ESMQ101E□□221MK20S
	330	12.5×25	0.08	760	ESMQ101E□□331MK25S
	470	16×25	0.08	1,000	ESMQ101E□□471ML25S
	1,000	18×35.5	0.08	1,350	ESMQ101E□□102MMP1S
	2,200	22×50	0.08	2,400	ESMQ101E□□222MP50S
160	10	8×11.5	0.20	80	ESMQ161E□□100MHB5D
	22	10×12.5	0.20	130	ESMQ161E□□220MJC5S
	33	10×16	0.20	180	ESMQ161E□□330MJ16S
	47	10×20	0.20	210	ESMQ161E□□470MJ20S
	68	12.5×20	0.20	350	ESMQ161E□□680MK20S
	100	12.5×25	0.20	430	ESMQ161E□□101MK25S
	220	16×31.5	0.20	760	ESMQ161E□□221MLN3S
	330	18×35.5	0.20	995	ESMQ161E□□331MMP1S
	470	18×40	0.20	1,200	ESMQ161E□□471MM40S
200	1.0	6.3×11	0.20	22	ESMQ201E□□1R0MF11D
	2.2	6.3×11	0.20	33	ESMQ201E□□2R2MF11D
	3.3	6.3×11	0.20	40	ESMQ201E□□3R3MF11D
	4.7	6.3×11	0.20	50	ESMQ201E□□4R7MF11D
	10	8×11.5	0.20	80	ESMQ201E□□100MHB5D
	22	10×16	0.20	150	ESMQ201E□□220MJ16S
	33	10×20	0.20	205	ESMQ201E□□330MJ20S
	47	12.5×20	0.20	270	ESMQ201E□□470MK20S
	68	12.5×25	0.20	350	ESMQ201E□□680MK25S
	100	16×25	0.20	475	ESMQ201E□□101ML25S
	220	16×35.5	0.20	700	ESMQ201E□□221MLP1S
	330	18×40	0.20	950	ESMQ201E□□331MM40S
250	3.3	6.3×11	0.20	40	ESMQ251E□□3R3MF11D
	4.7	6.3×11	0.20	50	ESMQ251E□□4R7MF11D
	10	10×12.5	0.20	100	ESMQ251E□□100MJC5S
	22	10×20	0.20	170	ESMQ251E□□220MJ20S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85℃

SMQ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
250	33	10×20	0.20	200	ESMQ251E□□330MJ20S
	47	12.5×20	0.20	270	ESMQ251E□□470MK20S
	68	16×25	0.20	380	ESMQ251E□□680ML25S
	100	16×25	0.20	440	ESMQ251E□□101ML25S
	220	18×35.5	0.20	680	ESMQ251E□□221MMP1S
350	2.2	6.3×11	0.24	30	ESMQ351E□□2R2MF11D
	3.3	8×11.5	0.24	46	ESMQ351E□□3R3MHB5D
	4.7	8×11.5	0.24	55	ESMQ351E□□4R7MHB5D
	10	10×12.5	0.24	90	ESMQ351E□□100MJC5S
	22	12.5×20	0.24	185	ESMQ351E□□220MK20S
	33	12.5×25	0.24	240	ESMQ351E□□330MK25S
	47	16×25	0.24	325	ESMQ351E□□470ML25S
	68	16×25	0.24	400	ESMQ351E□□680ML25S
	100	18×31.5	0.24	530	ESMQ351E□□101MMN3S
400	0.47	6.3×11	0.24	12	ESMQ401E□□R47MF11D
	1.0	6.3×11	0.24	22	ESMQ401E□□1R0MF11D
	2.2	8×11.5	0.24	38	ESMQ401E□□2R2MHB5D

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
400	3.3	8×11.5	0.24	48	ESMQ401E□□3R3MHB5D
	4.7	10×12.5	0.24	60	ESMQ401E□□4R7MJC5S
	10	10×16	0.24	90	ESMQ401E□□100MJ16S
	22	12.5×25	0.24	205	ESMQ401E□□220MK25S
	33	16×25	0.24	275	ESMQ401E□□330ML25S
	47	16×25	0.24	280	ESMQ401E□□470ML25S
	68	16×31.5	0.24	340	ESMQ401E□□680MLN3S
	100	18×35.5	0.24	440	ESMQ401E□□101MMP1S
450	2.2	8×11.5	0.24	28	ESMQ451E□□2R2MHB5D
	3.3	10×12.5	0.24	40	ESMQ451E□□3R3MJC5S
	4.7	10×12.5	0.24	46	ESMQ451E□□4R7MJC5S
	10	10×20	0.24	80	ESMQ451E□□100MJ20S
	22	12.5×25	0.24	140	ESMQ451E□□220MK25S
	33	16×25	0.24	180	ESMQ451E□□330ML25S
	47	16×31.5	0.24	220	ESMQ451E□□470MLN3S
	68	18×35.5	0.24	260	ESMQ451E□□680MMP1S
	100	18×40	0.24	280	ESMQ451E□□101MM40S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

(φ5 to φ18)

Capacitance (μF) \ Frequency (Hz)	50	120	300	1k	10k	100k
0.1 to 4.7	0.65	1.00	1.35	1.75	2.30	2.50
10 to 68	0.75	1.00	1.25	1.50	1.75	1.80
100 to 1,000	0.80	1.00	1.15	1.30	1.40	1.50
2,200 to	0.85	1.00	1.03	1.05	1.08	1.08

(φ20 to φ22)

Rated Voltage (Vdc) \ Frequency (Hz)	50	120	300	1k	10k	100k
6.3 to 50	0.95	1.00	1.03	1.05	1.08	1.08
63 to 100	0.92	1.00	1.07	1.13	1.19	1.20

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 105℃

KMQ Series

- Downsized from current standard KMG series
- Solvent-proof type except 160 to 450Vdc
  (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

KMQ ↑ Downsized
KMG

◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−55 to +105℃(6.3 to 100Vdc) −40 to +105℃(160 to 400Vdc) -25 to +105℃(450Vdc)
Rated Voltage Range	6.3 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	6.3 to 100Vdc / 160 to 450Vdc ≦φ18: I=0.03CV or 4μA, whichever is greater. (at 20℃ after 1 minute) / CV≦1,000: I=0.1CV+40 max. / CV>1,000: I=0.04CV+100 max. (at 20℃) ≧φ20: I=0.03CV max. (at 20℃ after 3 minutes) Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)

Dissipation Factor (tanδ)

Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	100V	160 to 250V	350 to 400V	450V
tanδ (Max.)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.20	0.24	0.24

When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)

Low Temperature Characteristics (Max. Impedance Ratio)

Rated voltage (Vdc)		6.3V	10V	16V	25V	35V	50V	63 to 100V	160 to 200V	250V	350V	400V	450V
Z(-25℃)/Z(+20℃)	≦φ8	5	4	3	2	2	2	2	3	3	4	4	6
	≧φ10	5	4	3	2	2	2	2	3	3	4	4	6
Z(-40℃)/Z(+20℃)	≦φ8	10	8	6	4	3	3	3	8	10	8	8	—
	≧φ10	10	8	6	4	3	3	3	4	4	6	6	—

(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 1,000 hours (2,000 hours for φ10 and more 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

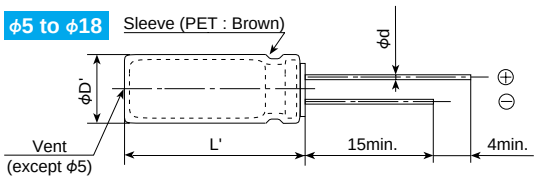
The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied.

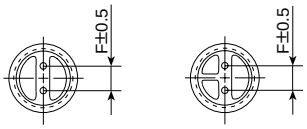
Rated voltage	6.3 to 100Vdc	160 to 450Vdc
Capacitance change	≦±20% of the initial value	≦±20% of the initial value
D.F. (tanδ)	≦200% of the initial specified value	≦200% of the initial specified value
Leakage current	≦The initial specified value	≦500% of the initial specified value

◆DIMENSIONS [mm]

- Terminal Code : E

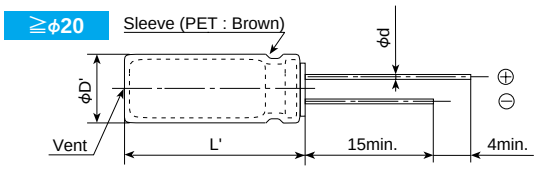
φ5 to φ18 — Sleeve (PET : Brown)

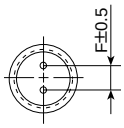




Gas escape end seal

≧φ20 — Sleeve (PET : Brown)





φD	5	6.3	8	10	12.5	16	18	20	22
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	10.0
φD'	φD+0.5max.							φD+0.5max.	
L'	L+1.5max.							L+2.0max.	

◆PART NUMBERING SYSTEM

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

- 18: Supplement code
- 15 16 17: Size code
- 14: Capacitance tolerance code
- 11 12 13: Capacitance code (ex. 0.1μF:R10,10μF:100,100μF:101)
- 9 10: Lead forming·taping code
- 8: Terminal code
- 5 6 7: Voltage code (ex. 6.3V:6R3,35V:350,100V:101)
- 3 4: Series code
- 1 2: Category

Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 105℃

KMQ Series

◆STANDARD RATINGS

is non solvent-proof.

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 105℃,120Hz)	Part No.
6.3	1,000	8×11.5	0.28	390	EKMQ6R3E□□102MHB5D
	2,200	10×16	0.30	635	EKMQ6R3E□□222MJ16S
	3,300	10×20	0.32	840	EKMQ6R3E□□332MJ20S
	4,700	12.5×20	0.34	1,090	EKMQ6R3E□□472MK20S
	6,800	12.5×25	0.38	1,350	EKMQ6R3E□□682MK25S
	10,000	16×25	0.46	1,650	EKMQ6R3E□□103ML25S
	15,000	16×31.5	0.56	1,820	EKMQ6R3E□□153MLN3S
	22,000	18×35.5	0.70	2,280	EKMQ6R3E□□223MMP1S
	33,000	20×40	0.92	2,500	EKMQ6R3E□□333MN40S
	47,000	22×50	1.20	2,780	EKMQ6R3E□□473MP50S
10	220	5×11	0.24	155	EKMQ100E□□221ME11D
	330	6.3×11	0.24	210	EKMQ100E□□331MF11D
	470	6.3×11	0.24	250	EKMQ100E□□471MF11D
	1,000	10×12.5	0.24	460	EKMQ100E□□102MJC5S
	2,200	10×16	0.26	705	EKMQ100E□□222MJ16S
	3,300	12.5×20	0.28	1,000	EKMQ100E□□332MK20S
	4,700	12.5×25	0.30	1,260	EKMQ100E□□472MK25S
	6,800	16×25	0.34	1,570	EKMQ100E□□682ML25S
	10,000	16×31.5	0.42	1,820	EKMQ100E□□103MLN3S
	15,000	16×35.5	0.52	2,050	EKMQ100E□□153MLP1S
	22,000	18×40	0.66	2,420	EKMQ100E□□223MM40S
	33,000	22×50	0.88	3,210	EKMQ100E□□333MP50S
16	220	6.3×11	0.20	190	EKMQ160E□□221MF11D
	330	6.3×11	0.20	225	EKMQ160E□□331MF11D
	470	8×11.5	0.20	315	EKMQ160E□□471MHB5D
	1,000	10×12.5	0.20	500	EKMQ160E□□102MJC5S
	2,200	10×20	0.22	710	EKMQ160E□□222MJ20S
	3,300	12.5×25	0.24	1,170	EKMQ160E□□332MK25S
	4,700	16×25	0.26	1,500	EKMQ160E□□472ML25S
	6,800	16×25	0.30	1,600	EKMQ160E□□682ML25S
	10,000	16×35.5	0.38	1,930	EKMQ160E□□103MLP1S
	15,000	18×40	0.48	2,210	EKMQ160E□□153MM40S
	22,000	22×40	0.62	2,710	EKMQ160E□□223MP40S
25	100	5×11	0.16	125	EKMQ250E□□101ME11D
	220	6.3×11	0.16	200	EKMQ250E□□221MF11D
	330	8×11.5	0.16	310	EKMQ250E□□331MHB5D
	470	10×12.5	0.16	380	EKMQ250E□□471MJC5S
	1,000	10×16	0.16	610	EKMQ250E□□102MJ16S
	2,200	12.5×25	0.18	1,090	EKMQ250E□□222MK25S
	3,300	16×25	0.20	1,400	EKMQ250E□□332ML25S
	4,700	16×25	0.22	1,570	EKMQ250E□□472ML25S
	6,800	16×35.5	0.26	1,850	EKMQ250E□□682MLP1S
	10,000	18×40	0.34	2,000	EKMQ250E□□103MM40S
	15,000	22×50	0.44	2,750	EKMQ250E□□153MP50S
35	47	5×11	0.14	93	EKMQ350E□□470ME11D
	68	6.3×11	0.14	110	EKMQ350E□□680MF11D
	100	6.3×11	0.14	150	EKMQ350E□□101MF11D
	220	8×11.5	0.14	270	EKMQ350E□□221MHB5D
	330	10×12.5	0.14	350	EKMQ350E□□331MJC5S
	470	10×16	0.14	460	EKMQ350E□□471MJ16S
	1,000	12.5×20	0.14	810	EKMQ350E□□102MK20S
	2,200	16×25	0.16	1,260	EKMQ350E□□222ML25S
	3,300	16×31.5	0.18	1,500	EKMQ350E□□332MLN3S
	4,700	16×35.5	0.20	1,780	EKMQ350E□□472MLP1S
	6,800	18×40	0.24	2,000	EKMQ350E□□682MM40S
	10,000	22×50	0.32	2,650	EKMQ350E□□103MP50S
50	0.10	5×11	0.12	1.3	EKMQ500E□□R10ME11D
	0.22	5×11	0.12	2.9	EKMQ500E□□R22ME11D
	0.33	5×11	0.12	4.3	EKMQ500E□□R33ME11D
	0.47	5×11	0.12	7.0	EKMQ500E□□R47ME11D
	1.0	5×11	0.12	13	EKMQ500E□□1R0ME11D
	2.2	5×11	0.12	20	EKMQ500E□□2R2ME11D
	3.3	5×11	0.12	25	EKMQ500E□□3R3ME11D
	4.7	5×11	0.12	30	EKMQ500E□□4R7ME11D
	10	5×11	0.12	46	EKMQ500E□□100ME11D
	22	5×11	0.12	68	EKMQ500E□□220ME11D
	33	5×11	0.12	90	EKMQ500E□□330ME11D
50	47	6.3×11	0.12	115	EKMQ500E□□470MF11D
	68	6.3×11	0.12	150	EKMQ500E□□680MF11D
	100	8×11.5	0.12	190	EKMQ500E□□101MHB5D
	220	10×12.5	0.12	300	EKMQ500E□□221MJC5S
	330	10×16	0.12	410	EKMQ500E□□331MJ16S
	470	10×20	0.12	540	EKMQ500E□□471MJ20S
	1,000	12.5×25	0.12	950	EKMQ500E□□102MK25S
	2,200	16×31.5	0.14	1,410	EKMQ500E□□222MLN3S
	3,300	18×35.5	0.16	1,770	EKMQ500E□□332MMP1S
	4,700	20×40	0.18	2,100	EKMQ500E□□472MN40S
	6,800	22×50	0.22	2,500	EKMQ500E□□682MP50S
63	22	5×11	0.10	71	EKMQ630E□□220ME11D
	33	6.3×11	0.10	100	EKMQ630E□□330MF11D
	47	6.3×11	0.10	120	EKMQ630E□□470MF11D
	68	8×11.5	0.10	155	EKMQ630E□□680MHB5D
	100	8×11.5	0.10	200	EKMQ630E□□101MHB5D
	220	10×16	0.10	335	EKMQ630E□□221MJ16S
	330	10×20	0.10	510	EKMQ630E□□331MJ20S
	470	12.5×20	0.10	640	EKMQ630E□□471MK20S
	1,000	16×25	0.10	930	EKMQ630E□□102ML25S
	2,200	18×35.5	0.12	1,650	EKMQ630E□□222MMP1S
	3,300	20×40	0.14	1,950	EKMQ630E□□332MN40S
	4,700	22×50	0.16	2,450	EKMQ630E□□472MP50S
100	0.10	5×11	0.08	1.5	EKMQ101E□□R10ME11D
	0.22	5×11	0.08	3.4	EKMQ101E□□R22ME11D
	0.33	5×11	0.08	5.0	EKMQ101E□□R33ME11D
	0.47	5×11	0.08	7.1	EKMQ101E□□R47ME11D
	1.0	5×11	0.08	15	EKMQ101E□□1R0ME11D
	2.2	5×11	0.08	21	EKMQ101E□□2R2ME11D
	3.3	5×11	0.08	29	EKMQ101E□□3R3ME11D
	4.7	5×11	0.08	32	EKMQ101E□□4R7ME11D
	10	5×11	0.08	50	EKMQ101E□□100ME11D
	22	6.3×11	0.08	93	EKMQ101E□□220MF11D
	33	8×11.5	0.08	130	EKMQ101E□□330MHB5D
	47	8×11.5	0.08	140	EKMQ101E□□470MHB5D
	68	10×12.5	0.08	190	EKMQ101E□□680MJC5S
	100	10×16	0.08	240	EKMQ101E□□101MJ16S
	220	12.5×20	0.08	390	EKMQ101E□□221MK20S
	330	12.5×25	0.08	540	EKMQ101E□□331MK25S
	470	16×25	0.08	715	EKMQ101E□□471ML25S
	1,000	18×35.5	0.08	960	EKMQ101E□□102MMP1S
	2,200	22×50	0.10	1,750	EKMQ101E□□222MP50S
160	10	8×11.5	0.20	41	EKMQ161E□□100MHB5D
	22	10×12.5	0.20	92	EKMQ161E□□220MJC5S
	33	10×16	0.20	125	EKMQ161E□□330MJ16S
	47	10×20	0.20	150	EKMQ161E□□470MJ20S
	68	12.5×20	0.20	250	EKMQ161E□□680MK20S
	100	12.5×25	0.20	310	EKMQ161E□□101MK25S
	220	16×31.5	0.20	540	EKMQ161E□□221MLN3S
	330	18×35.5	0.20	705	EKMQ161E□□331MMP1S
	470	18×40	0.20	855	EKMQ161E□□471MM40S
200	1.0	6.3×11	0.20	16	EKMQ201E□□1R0MF11D
	2.2	6.3×11	0.20	25	EKMQ201E□□2R2MF11D
	3.3	6.3×11	0.20	30	EKMQ201E□□3R3MF11D
	4.7	6.3×11	0.20	35	EKMQ201E□□4R7MF11D
	10	8×11.5	0.20	57	EKMQ201E□□100MHB5D
	22	10×16	0.20	105	EKMQ201E□□220MJ16S
	33	10×20	0.20	140	EKMQ201E□□330MJ20S
	47	12.5×20	0.20	195	EKMQ201E□□470MK20S
	68	12.5×25	0.20	250	EKMQ201E□□680MK25S
	100	16×25	0.20	335	EKMQ201E□□101ML25S
	220	16×35.5	0.20	500	EKMQ201E□□221MLP1S
	330	18×40	0.20	675	EKMQ201E□□331MM40S
250	3.3	6.3×11	0.20	28	EKMQ251E□□3R3MF11D
	4.7	6.3×11	0.20	35	EKMQ251E□□4R7MF11D
	10	10×12.5	0.20	71	EKMQ251E□□100MJC5S
	22	10×20	0.20	105	EKMQ251E□□220MJ20S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 105℃

KMQ Series

◆STANDARD RATINGS

is non solvent-proof.

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 105℃,120Hz)	Part No.
250	33	10×20	0.20	140	EKMQ251E□□330MJ20S
	47	12.5×20	0.20	190	EKMQ251E□□470MK20S
	68	16×25	0.20	270	EKMQ251E□□680ML25S
	100	16×25	0.20	310	EKMQ251E□□101ML25S
	220	18×35.5	0.20	485	EKMQ251E□□221MMP1S
350	2.2	6.3×11	0.24	21	EKMQ351E□□2R2MF11D
	3.3	8×11.5	0.24	30	EKMQ351E□□3R3MHB5D
	4.7	8×11.5	0.24	39	EKMQ351E□□4R7MHB5D
	10	10×12.5	0.24	64	EKMQ351E□□100MJC5S
	22	12.5×20	0.24	130	EKMQ351E□□220MK20S
	33	12.5×25	0.24	170	EKMQ351E□□330MK25S
	47	16×25	0.24	230	EKMQ351E□□470ML25S
	68	16×25	0.24	285	EKMQ351E□□680ML25S
	100	18×31.5	0.24	375	EKMQ351E□□101MMN3S
400	0.47	6.3×11	0.24	8.5	EKMQ401E□□R47MF11D
	1.0	6.3×11	0.24	15	EKMQ401E□□1R0MF11D
	2.2	8×11.5	0.24	27	EKMQ401E□□2R2MHB5D

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 105℃,120Hz)	Part No.
400	3.3	8×11.5	0.24	34	EKMQ401E□□3R3MHB5D
	4.7	10×12.5	0.24	42	EKMQ401E□□4R7MJC5S
	10	10×16	0.24	64	EKMQ401E□□100MJ16S
	22	12.5×25	0.24	145	EKMQ401E□□220MK25S
	33	16×25	0.24	195	EKMQ401E□□330ML25S
	47	16×25	0.24	200	EKMQ401E□□470ML25S
	68	16×31.5	0.24	240	EKMQ401E□□680MLN3S
	100	18×35.5	0.24	310	EKMQ401E□□101MMP1S
450	2.2	8×11.5	0.24	20	EKMQ451E□□2R2MHB5D
	3.3	10×12.5	0.24	28	EKMQ451E□□3R3MJC5S
	4.7	10×12.5	0.24	32	EKMQ451E□□4R7MJC5S
	10	10×20	0.24	56	EKMQ451E□□100MJ20S
	22	12.5×25	0.24	100	EKMQ451E□□220MK25S
	33	16×25	0.24	125	EKMQ451E□□330ML25S
	47	16×31.5	0.24	155	EKMQ451E□□470MLN3S
	68	18×35.5	0.24	185	EKMQ451E□□680MMP1S
	100	18×40	0.24	200	EKMQ451E□□101MM40S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

(φ5 to φ18)

Capacitance (μF) \ Frequency (Hz)	50	120	300	1k	10k	100k
0.1 to 4.7	0.65	1.00	1.35	1.75	2.30	2.50
10 to 68	0.75	1.00	1.25	1.50	1.75	1.80
100 to 1,000	0.80	1.00	1.15	1.30	1.40	1.50
2,200 to	0.85	1.00	1.03	1.05	1.08	1.08

(φ20 to φ22)

Rated Voltage (Vdc) \ Frequency (Hz)	50	120	300	1k	10k	100k
6.3 to 50	0.95	1.00	1.03	1.05	1.08	1.08
63 to 100	0.92	1.00	1.07	1.13	1.19	1.20

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85℃

SMG Series

SMQ
Downsized
SMG
Downsized
SME

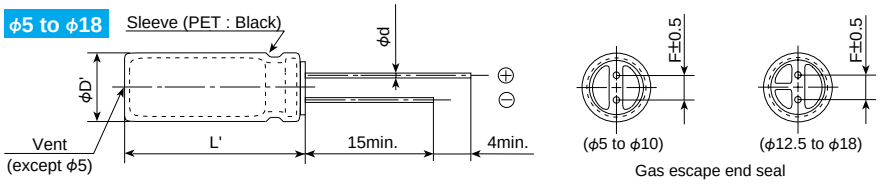
- Downsized from SME series
- Endurance : 2,000 hours at 85℃
- Solvent-proof type except 315 to 450Vdc
  (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

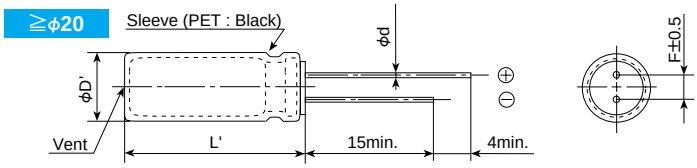
◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−40 to +85℃(6.3 to 400Vdc)　−25 to +85℃(450Vdc)
Rated Voltage Range	6.3 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	6.3 to 100Vdc: ≦φ18: I=0.03CV or 4μA, whichever is greater. (at 20℃ after 1 minute); ≧φ20: I=0.03CV (at 20℃ after 3 minutes) 160 to 450Vdc: CV≦1,000: After 1minute I=0.1CV+40 max., After 5minutes I=0.03CV+15 max.; CV>1,000: After 1minute I=0.04CV+100 max., After 5minutes I=0.02CV+25 max. (at 20℃) Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)
Dissipation Factor (tanδ)	Rated voltage (Vdc): 6.3V / 10V / 16V / 25V / 35V / 50V / 63V / 100V / 160 to 250V / 315 to 400V / 450V tanδ (Max.) ≦φ18: 0.34 / 0.24 / 0.20 / 0.16 / 0.14 / 0.12 / 0.09 / 0.08 / 0.20 / 0.24 / 0.24 tanδ (Max.) ≧φ20: 0.28 / 0.24 / 0.20 / 0.16 / 0.14 / 0.12 / 0.09 / 0.08 / 0.15 / 0.15 / 0.20 When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc): 6.3V / 10V / 16V / 25V / 35V / 50V / 63V / 100V / 160 to 250V / 315 to 400V / 450V Z(−25℃)/Z(+20℃) ≦φ18: 5 / 4 / 3 / 2 / 2 / 2 / 2 / 2 / 3 / 6 / 6 Z(−25℃)/Z(+20℃) ≧φ20: 5 / 4 / 3 / 2 / 2 / 2 / 2 / 2 / 4 / 6 / 6 Z(−40℃)/Z(+20℃) ≦φ18: 12 / 10 / 8 / 5 / 4 / 3 / 3 / 3 / 4 / 6 / — (at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage 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 1,000 hours at 85℃ without voltage applied. Rated voltage: 6.3 to 100Vdc / 160 to 450Vdc Capacitance change: ≦±20% of the initial value / ≦±20% of the initial value D.F. (tanδ): ≦200% of the initial specified value / ≦200% of the initial specified value Leakage current: ≦The initial specified value / ≦500% of the initial specified value

◆DIMENSIONS [mm]

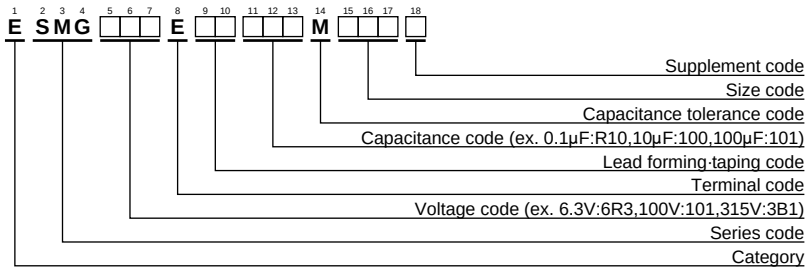
- Terminal Code : E





φD	5	6.3	8	10	12.5	16	18	20	22	25.4
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0	1.0
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	10.0	12.5
φD'	φD+0.5max.							φD+0.5max.		
L'	L+1.5max.							L+2.0max.		

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85℃

SMG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
6.3	33	5×11	0.34	77	ESMG6R3E□□330ME11D
	47	5×11	0.34	92	ESMG6R3E□□470ME11D
	100	5×11	0.34	134	ESMG6R3E□□101ME11D
	220	5×11	0.34	200	ESMG6R3E□□221ME11D
	330	6.3×11	0.34	270	ESMG6R3E□□331MF11D
	470	6.3×11	0.34	320	ESMG6R3E□□471MF11D
	1,000	8×11.5	0.34	540	ESMG6R3E□□102MHB5D
	2,200	10×20	0.36	1,000	ESMG6R3E□□222MJ20S
	3,300	10×20	0.38	1,185	ESMG6R3E□□332MJ20S
	4,700	12.5×20	0.40	1,545	ESMG6R3E□□472MK20S
	6,800	12.5×25	0.44	1,915	ESMG6R3E□□682MK25S
	10,000	16×25	0.52	2,330	ESMG6R3E□□103ML25S
	10,000	20×25	0.46	2,310	ESMG6R3E□□103MN25S
	15,000	16×35.5	0.62	2,845	ESMG6R3E□□153MLP1S
	15,000	20×30	0.56	2,660	ESMG6R3E□□153MN30S
	18,000	20×35	0.62	2,890	ESMG6R3E□□183MN35S
	18,000	22×30	0.62	2,860	ESMG6R3E□□183MP30S
	22,000	18×40	0.76	3,320	ESMG6R3E□□223MM40S
	22,000	20×40	0.70	3,130	ESMG6R3E□□223MN40S
	22,000	22×35	0.70	3,130	ESMG6R3E□□223MP35S
	27,000	22×40	0.80	3,280	ESMG6R3E□□273MP40S
	39,000	25.4×40	1.04	3,560	ESMG6R3E□□393MQ40S
10	22	5×11	0.24	66	ESMG100E□□220ME11D
	33	5×11	0.24	83	ESMG100E□□330ME11D
	47	5×11	0.24	100	ESMG100E□□470ME11D
	100	5×11	0.24	146	ESMG100E□□101ME11D
	220	5×11	0.24	240	ESMG100E□□221ME11D
	330	6.3×11	0.24	290	ESMG100E□□331MF11D
	470	6.3×11	0.24	350	ESMG100E□□471MF11D
	1,000	10×12.5	0.24	650	ESMG100E□□102MJC5S
	2,200	10×20	0.26	1,070	ESMG100E□□222MJ20S
	3,300	12.5×20	0.28	1,420	ESMG100E□□332MK20S
	4,700	12.5×25	0.30	1,780	ESMG100E□□472MK25S
	6,800	16×25	0.34	2,220	ESMG100E□□682ML25S
	6,800	20×20	0.34	2,080	ESMG100E□□682MN20S
	10,000	16×35.5	0.42	2,670	ESMG100E□□103MLP1S
	10,000	20×25	0.42	2,410	ESMG100E□□103MN25S
	12,000	20×30	0.46	2,620	ESMG100E□□123MN30S
	15,000	18×35.5	0.52	3,080	ESMG100E□□153MMP1S
	15,000	20×35	0.52	2,870	ESMG100E□□153MN35S
	15,000	22×30	0.52	2,660	ESMG100E□□153MP30S
	18,000	22×35	0.58	3,050	ESMG100E□□183MP35S
	22,000	22×40	0.66	3,480	ESMG100E□□223MP40S
	33,000	25.4×40	0.88	3,560	ESMG100E□□333MQ40S
16	10	5×11	0.20	50	ESMG160E□□100ME11D
	22	5×11	0.20	75	ESMG160E□□220ME11D
	33	5×11	0.20	91	ESMG160E□□330ME11D
	47	5×11	0.20	109	ESMG160E□□470ME11D
	100	5×11	0.20	160	ESMG160E□□101ME11D
	220	6.3×11	0.20	260	ESMG160E□□221MF11D
	330	8×11.5	0.20	370	ESMG160E□□331MHB5D
	470	8×11.5	0.20	440	ESMG160E□□471MHB5D
	1,000	10×16	0.20	785	ESMG160E□□102MJ16S
	2,200	12.5×20	0.22	1,295	ESMG160E□□222MK20S
	3,300	12.5×25	0.24	1,655	ESMG160E□□332MK25S
	4,700	16×25	0.26	2,090	ESMG160E□□472ML25S
	4,700	20×20	0.26	1,960	ESMG160E□□472MN20S
	6,800	16×31.5	0.30	2,520	ESMG160E□□682MLN3S
	6,800	20×25	0.30	2,330	ESMG160E□□682MN25S
	8,200	20×30	0.34	2,500	ESMG160E□□822MN30S
	10,000	18×35.5	0.38	2,920	ESMG160E□□103MMP1S
	10,000	20×35	0.38	2,720	ESMG160E□□103MN35S
	10,000	22×30	0.38	2,660	ESMG160E□□103MP30S
	12,000	20×40	0.42	2,900	ESMG160E□□123MN40S
	12,000	22×35	0.42	2,900	ESMG160E□□123MP35S
	15,000	22×40	0.48	3,380	ESMG160E□□153MP40S
	22,000	25.4×40	0.62	3,720	ESMG160E□□223MQ40S

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
25	4.7	5×11	0.16	36	ESMG250E□□4R7ME11D
	10	5×11	0.16	53	ESMG250E□□100ME11D
	22	5×11	0.16	78	ESMG250E□□220ME11D
	33	5×11	0.16	96	ESMG250E□□330ME11D
	47	5×11	0.16	115	ESMG250E□□470ME11D
	100	6.3×11	0.16	190	ESMG250E□□101MF11D
	220	8×11.5	0.16	330	ESMG250E□□221MHB5D
	330	8×11.5	0.16	440	ESMG250E□□331MHB5D
	470	10×12.5	0.16	545	ESMG250E□□471MJC5S
	1,000	10×20	0.16	955	ESMG250E□□102MJ20S
	2,200	12.5×25	0.18	1,540	ESMG250E□□222MK25S
	3,300	16×25	0.20	1,975	ESMG250E□□332ML25S
	3,300	20×20	0.20	1,850	ESMG250E□□332MN20S
	4,700	16×31.5	0.22	2,420	ESMG250E□□472MLN3S
	4,700	20×25	0.22	2,420	ESMG250E□□472MN25S
	5,600	20×30	0.24	2,430	ESMG250E□□562MN30S
	6,800	18×35.5	0.26	2,880	ESMG250E□□682MMP1S
	6,800	20×35	0.26	2,680	ESMG250E□□682MN35S
	6,800	22×30	0.26	2,510	ESMG250E□□682MP30S
	8,200	20×40	0.30	2,810	ESMG250E□□822MN40S
	8,200	22×35	0.30	2,810	ESMG250E□□822MP35S
	10,000	22×40	0.34	3,240	ESMG250E□□103MP40S
	12,000	22×40	0.38	3,240	ESMG250E□□123MP40S
	15,000	25.4×40	0.44	3,610	ESMG250E□□153MQ40S
35	4.7	5×11	0.14	41	ESMG350E□□4R7ME11D
	10	5×11	0.14	59	ESMG350E□□100ME11D
	22	5×11	0.14	88	ESMG350E□□220ME11D
	33	5×11	0.14	108	ESMG350E□□330ME11D
	47	5×11	0.14	130	ESMG350E□□470ME11D
	100	6.3×11	0.14	210	ESMG350E□□101MF11D
	220	8×11.5	0.14	385	ESMG350E□□221MHB5D
	330	10×12.5	0.14	490	ESMG350E□□331MJC5S
	470	10×16	0.14	645	ESMG350E□□471MJ16S
	1,000	12.5×20	0.14	1,145	ESMG350E□□102MK20S
	2,200	16×25	0.16	1,785	ESMG350E□□222ML25S
	2,200	20×20	0.16	1,670	ESMG350E□□222MN20S
	3,300	16×35.5	0.18	2,275	ESMG350E□□332MLP1S
	3,300	20×25	0.18	2,050	ESMG350E□□332MN25S
	3,900	20×30	0.18	2,310	ESMG350E□□392MN30S
	4,700	18×35.5	0.20	2,700	ESMG350E□□472MMP1S
	4,700	20×35	0.20	2,510	ESMG350E□□472MN35S
	4,700	22×30	0.20	2,380	ESMG350E□□472MP30S
	5,600	20×40	0.22	2,690	ESMG350E□□562MN40S
	5,600	22×35	0.22	2,690	ESMG350E□□562MP35S
	6,800	22×40	0.24	3,090	ESMG350E□□682MP40S
	10,000	25.4×40	0.32	3,480	ESMG350E□□103MQ40S
50	0.10	5×11	0.12	1.3	ESMG500E□□R10ME11D
	0.22	5×11	0.12	2.9	ESMG500E□□R22ME11D
	0.33	5×11	0.12	4.3	ESMG500E□□R33ME11D
	0.47	5×11	0.12	6.2	ESMG500E□□R47ME11D
	1.0	5×11	0.12	17	ESMG500E□□1R0ME11D
	2.2	5×11	0.12	28	ESMG500E□□2R2ME11D
	3.3	5×11	0.12	35	ESMG500E□□3R3ME11D
	4.7	5×11	0.12	41	ESMG500E□□4R7ME11D
	10	5×11	0.12	60	ESMG500E□□100ME11D
	22	5×11	0.12	95	ESMG500E□□220ME11D
	33	5×11	0.12	125	ESMG500E□□330ME11D
	47	6.3×11	0.12	155	ESMG500E□□470MF11D
	100	8×11.5	0.12	260	ESMG500E□□101MHB5D
	220	10×12.5	0.12	430	ESMG500E□□221MJC5S
	330	10×16	0.12	585	ESMG500E□□331MJ16S
	470	10×20	0.12	755	ESMG500E□□471MJ20S
	1,000	12.5×25	0.12	1,340	ESMG500E□□102MK25S
	1,500	20×20	0.12	1,570	ESMG500E□□152MN20S
	2,200	16×35.5	0.14	2,075	ESMG500E□□222MLP1S
	2,200	20×25	0.14	1,880	ESMG500E□□222MN25S
	2,700	20×30	0.14	2,150	ESMG500E□□272MN30S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85℃

SMG Series

◆STANDARD RATINGS

is non solvent-proof.

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
50	3,300	18×35.5	0.16	2,500	ESMG500E□□332MMP1S
	3,300	20×35	0.16	2,420	ESMG500E□□332MN35S
	3,300	22×30	0.16	2,420	ESMG500E□□332MP30S
	3,900	20×40	0.16	2,590	ESMG500E□□392MN40S
	3,900	22×35	0.16	2,590	ESMG500E□□392MP35S
	4,700	22×40	0.18	2,960	ESMG500E□□472MP40S
	6,800	25.4×40	0.22	3,360	ESMG500E□□682MQ40S
63	10	5×11	0.09	65	ESMG630E□□100ME11D
	22	5×11	0.09	100	ESMG630E□□220ME11D
	33	6.3×11	0.09	140	ESMG630E□□330MF11D
	47	6.3×11	0.09	170	ESMG630E□□470MF11D
	100	10×12.5	0.09	300	ESMG630E□□101MJC5S
	220	10×16	0.09	490	ESMG630E□□221MJ16S
	330	10×20	0.09	710	ESMG630E□□331MJ20S
	470	12.5×20	0.09	900	ESMG630E□□471MK20S
	820	20×20	0.09	1,370	ESMG630E□□821MN20S
	1,000	16×25	0.09	1,300	ESMG630E□□102ML25S
	1,000	20×25	0.09	1,600	ESMG630E□□102MN25S
	1,500	20×30	0.09	1,850	ESMG630E□□152MN30S
	2,200	20×35	0.11	2,330	ESMG630E□□222MN35S
	2,200	22×30	0.11	2,190	ESMG630E□□222MP30S
	2,700	20×40	0.11	2,640	ESMG630E□□272MN40S
	3,300	22×40	0.13	2,810	ESMG630E□□332MP40S
	3,900	25.4×40	0.13	3,100	ESMG630E□□392MQ40S
100	0.10	5×11	0.08	2.1	ESMG101E□□R10ME11D
	0.22	5×11	0.08	4.7	ESMG101E□□R22ME11D
	0.33	5×11	0.08	7.0	ESMG101E□□R33ME11D
	0.47	5×11	0.08	10	ESMG101E□□R47ME11D
	1.0	5×11	0.08	21	ESMG101E□□1R0ME11D
	2.2	5×11	0.08	30	ESMG101E□□2R2ME11D
	3.3	5×11	0.08	40	ESMG101E□□3R3ME11D
	4.7	5×11	0.08	45	ESMG101E□□4R7ME11D
	10	6.3×11	0.08	75	ESMG101E□□100MF11D
	22	8×11.5	0.08	130	ESMG101E□□220MHB5D
	33	8×11.5	0.08	180	ESMG101E□□330MHB5D
	47	10×12.5	0.08	230	ESMG101E□□470MJC5S
	100	10×20	0.08	370	ESMG101E□□101MJ20S
	220	12.5×25	0.08	620	ESMG101E□□221MK25S
	330	12.5×25	0.08	760	ESMG101E□□331MK25S
	330	20×20	0.08	870	ESMG101E□□331MN20S
	470	16×25	0.08	1,000	ESMG101E□□471ML25S
	680	20×30	0.08	1,360	ESMG101E□□681MN30S
	820	22×30	0.08	1,540	ESMG101E□□821MP30S
	1,000	18×40	0.08	1,380	ESMG101E□□102MM40S
	1,000	20×35	0.08	1,720	ESMG101E□□102MN35S
	1,200	22×40	0.08	1,980	ESMG101E□□122MP40S
	1,800	25.4×40	0.08	2,490	ESMG101E□□182MQ40S
160	3.3	6.3×11	0.20	40	ESMG161E□□3R3MF11D
	4.7	6.3×11	0.20	48	ESMG161E□□4R7MF11D
	10	10×12.5	0.20	94	ESMG161E□□100MJC5S
	22	10×20	0.20	170	ESMG161E□□220MJ20S
	33	10×20	0.20	205	ESMG161E□□330MJ20S
	47	12.5×20	0.20	270	ESMG161E□□470MK20S
	100	12.5×25	0.20	430	ESMG161E□□101MK25S
	220	16×31.5	0.20	760	ESMG161E□□221MLN3S
	220	20×25	0.15	730	ESMG161E□□221MN25S
	330	18×35.5	0.20	995	ESMG161E□□331MMP1S
	330	20×30	0.15	920	ESMG161E□□331MN30S
	390	20×35	0.15	1,160	ESMG161E□□391MN35S
	390	22×30	0.15	1,160	ESMG161E□□391MP30S
	470	20×40	0.15	1,340	ESMG161E□□471MN40S
	470	22×35	0.15	1,340	ESMG161E□□471MP35S
	560	22×40	0.15	1,470	ESMG161E□□561MP40S
	680	25.4×40	0.15	1,570	ESMG161E□□681MQ40S
200	3.3	6.3×11	0.20	40	ESMG201E□□3R3MF11D
	4.7	8×11.5	0.20	55	ESMG201E□□4R7MHB5D
	10	10×12.5	0.20	94	ESMG201E□□100MJC5S

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
200	22	10×20	0.20	170	ESMG201E□□220MJ20S
	33	10×20	0.20	205	ESMG201E□□330MJ20S
	47	12.5×20	0.20	270	ESMG201E□□470MK20S
	100	16×25	0.20	475	ESMG201E□□101ML25S
	100	20×20	0.15	460	ESMG201E□□101MN20S
	180	20×25	0.15	660	ESMG201E□□181MN25S
	220	18×35.5	0.20	810	ESMG201E□□221MMP1S
	220	20×30	0.15	750	ESMG201E□□221MN30S
	270	20×30	0.15	830	ESMG201E□□271MN30S
	330	20×35	0.15	1,070	ESMG201E□□331MN35S
	330	22×30	0.15	1,070	ESMG201E□□331MP30S
	390	20×40	0.15	1,190	ESMG201E□□391MN40S
	390	22×30	0.15	1,160	ESMG201E□□391MP30S
	470	22×40	0.15	1,350	ESMG201E□□471MP40S
	560	22×40	0.15	1,430	ESMG201E□□561MP40S
	680	25.4×40	0.15	1,620	ESMG201E□□681MQ40S
250	2.2	6.3×11	0.20	32	ESMG251E□□2R2MF11D
	3.3	8×11.5	0.20	46	ESMG251E□□3R3MHB5D
	4.7	8×11.5	0.20	55	ESMG251E□□4R7MHB5D
	10	10×16	0.20	105	ESMG251E□□100MJ16S
	22	10×20	0.20	170	ESMG251E□□220MJ20S
	33	12.5×20	0.20	230	ESMG251E□□330MK20S
	47	12.5×25	0.20	295	ESMG251E□□470MK25S
	82	20×20	0.15	420	ESMG251E□□820MN20S
	100	16×31.5	0.20	515	ESMG251E□□101MLN3S
	100	20×25	0.15	490	ESMG251E□□101MN25S
	120	20×25	0.15	530	ESMG251E□□121MN25S
	180	20×30	0.15	680	ESMG251E□□181MN30S
	220	18×40	0.20	825	ESMG251E□□221MM40S
	220	20×35	0.15	780	ESMG251E□□221MN35S
	220	22×30	0.15	820	ESMG251E□□221MP30S
	270	20×40	0.15	880	ESMG251E□□271MN40S
	270	22×35	0.15	880	ESMG251E□□271MP35S
	330	22×40	0.15	1,060	ESMG251E□□331MP40S
	390	25.4×40	0.15	1,200	ESMG251E□□391MQ40S
315	47	20×20	0.15	310	ESMG3B1E□□470MN20S
	68	20×25	0.15	400	ESMG3B1E□□680MN25S
	82	20×25	0.15	440	ESMG3B1E□□820MN25S
	100	20×30	0.15	500	ESMG3B1E□□101MN30S
	120	20×30	0.15	550	ESMG3B1E□□121MN30S
	180	20×40	0.15	720	ESMG3B1E□□181MN40S
	180	22×35	0.15	720	ESMG3B1E□□181MP35S
	220	22×40	0.15	810	ESMG3B1E□□221MP40S
	270	25.4×40	0.15	920	ESMG3B1E□□271MQ40S
350	0.47	6.3×11	0.24	15	ESMG351E□□R47MF11D
	1.0	6.3×11	0.24	22	ESMG351E□□1R0MF11D
	2.2	8×11.5	0.24	38	ESMG351E□□2R2MHB5D
	3.3	8×11.5	0.24	46	ESMG351E□□3R3MHB5D
	4.7	10×12.5	0.24	65	ESMG351E□□4R7MJC5S
	10	10×20	0.24	115	ESMG351E□□100MJ20S
	22	12.5×20	0.24	185	ESMG351E□□220MK20S
	33	16×25	0.24	275	ESMG351E□□330ML25S
	47	16×25	0.24	325	ESMG351E□□470ML25S
	47	20×20	0.15	310	ESMG351E□□470MN20S
	68	20×25	0.15	400	ESMG351E□□680MN25S
	100	18×31.5	0.24	530	ESMG351E□□101MMN3S
	100	20×30	0.15	500	ESMG351E□□101MN30S
	120	20×35	0.15	560	ESMG351E□□121MN35S
	220	25.4×40	0.15	890	ESMG351E□□221MQ40S
400	1.0	6.3×11	0.24	22	ESMG401E□□1R0MF11D
	2.2	8×11.5	0.24	38	ESMG401E□□2R2MHB5D
	3.3	10×12.5	0.24	54	ESMG401E□□3R3MJC5S
	4.7	10×16	0.24	71	ESMG401E□□4R7MJ16S
	10	10×20	0.24	115	ESMG401E□□100MJ20S
	22	12.5×25	0.24	205	ESMG401E□□220MK25S
	33	16×25	0.24	275	ESMG401E□□330ML25S
	33	20×20	0.15	260	ESMG401E□□330MN20S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85℃

SMG Series

◆STANDARD RATINGS

▭ is non solvent-proof.

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
400	47	16×31.5	0.24	350	ESMG401E□□470MLN3S
	56	20×25	0.15	350	ESMG401E□□560MN25S
	68	20×30	0.15	420	ESMG401E□□680MN30S
	100	20×35	0.15	520	ESMG401E□□101MN35S
	100	22×30	0.15	520	ESMG401E□□101MP30S
	120	20×40	0.15	580	ESMG401E□□121MN40S
	120	22×35	0.15	580	ESMG401E□□121MP35S
	180	25.4×40	0.15	790	ESMG401E□□181MQ40S
450	0.47	10×12.5	0.24	13	ESMG451E□□R47MJC5S
	1.0	10×12.5	0.24	19	ESMG451E□□1R0MJC5S
	2.2	10×12.5	0.24	32	ESMG451E□□2R2MJC5S
	3.3	10×16	0.24	44	ESMG451E□□3R3MJ16S
	4.7	10×20	0.24	56	ESMG451E□□4R7MJ20S
	10	12.5×20	0.24	91	ESMG451E□□100MK20S

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
450	22	16×25	0.24	165	ESMG451E□□220ML25S
	22	20×20	0.20	180	ESMG451E□□220MN20S
	33	16×31.5	0.24	215	ESMG451E□□330MLN3S
	33	20×25	0.20	240	ESMG451E□□330MN25S
	47	16×35.5	0.24	265	ESMG451E□□470MLP1S
	47	20×25	0.20	290	ESMG451E□□470MN25S
	56	20×30	0.20	320	ESMG451E□□560MN30S
	68	20×35	0.20	370	ESMG451E□□680MN35S
	68	22×30	0.20	370	ESMG451E□□680MP30S
	82	20×40	0.20	420	ESMG451E□□820MN40S
	82	22×35	0.20	420	ESMG451E□□820MP35S
	100	22×40	0.20	470	ESMG451E□□101MP40S
	120	25.4×40	0.20	520	ESMG451E□□121MQ40S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

(φ5 to φ18)

Capacitance (μF) \ Frequency (Hz)	50	120	300	1k	10k	100k
0.1 to 4.7	0.65	1.00	1.35	1.75	2.30	2.50
10 to 47	0.75	1.00	1.25	1.50	1.75	1.80
100 to 1,000	0.80	1.00	1.15	1.30	1.40	1.50
2,200 to	0.85	1.00	1.03	1.05	1.08	1.08

(φ20 to φ25.4)

Rated Voltage (Vdc) \ Frequency (Hz)	50	120	300	1k	10k	100k
6.3 to 50	0.95	1.00	1.03	1.05	1.08	1.08
63 to 100	0.92	1.00	1.07	1.13	1.19	1.20
160 to 250	0.81	1.00	1.17	1.32	1.45	1.50
315 to 450	0.77	1.00	1.16	1.30	1.41	1.43

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.

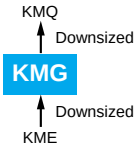
NIPPON CHEMI-CON

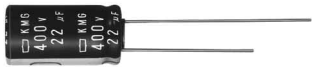
MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Standard, Downsized, 105℃

KMG Series

- Downsized from KME series
- Solvent-proof type except 350 to 450Vdc (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**





◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−55 to +105℃(6.3 to 100Vdc) −40 to +105℃(160 to 400Vdc) -25 to +105℃(450Vdc)
Rated Voltage Range	6.3 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	6.3 to 100Vdc: I=0.03CV or 4μA, whichever is greater. (at 20℃ after 1 minute) 160 to 450Vdc: CV≦1,000 → I=0.1CV+40 max. (after 1minute); I=0.03CV+15 max. (after 5minutes) CV>1,000 → I=0.04CV+100 max. (after 1minute); I=0.02CV+25 max. (after 5minutes) (at 20℃) Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)

Dissipation Factor (tanδ)

Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	100V	160 to 250V	350 to 400V	450V
tanδ (Max.)	0.34	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.20	0.24	0.24

When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)

Low Temperature Characteristics (Max. Impedance Ratio)

Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	100V	160 to 250V	350 to 400V	450V
Z(−25℃)/Z(+20℃)	5	4	3	2	2	2	2	2	3	6	6
Z(−40℃)/Z(+20℃)	12	10	8	5	4	3	3	3	4	6	—

(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 1,000 hours (2,000 hours to meet the following two conditions 1) : 160Vdc and larger, 2) : φ12.5 and larger) at 105℃.

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

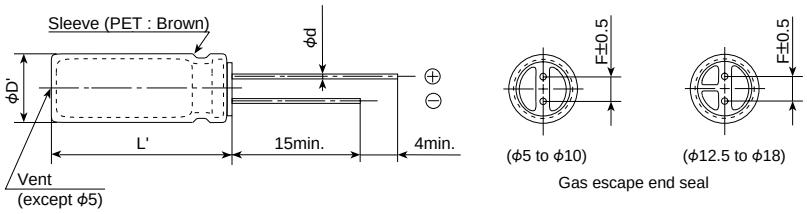
Shelf Life

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	6.3 to 100Vdc	160 to 450Vdc
Capacitance change	≦±20% of the initial value	≦±20% of the initial value
D.F. (tanδ)	≦200% of the initial specified value	≦200% of the initial specified value
Leakage current	≦The initial specified value	≦500% of the initial specified value

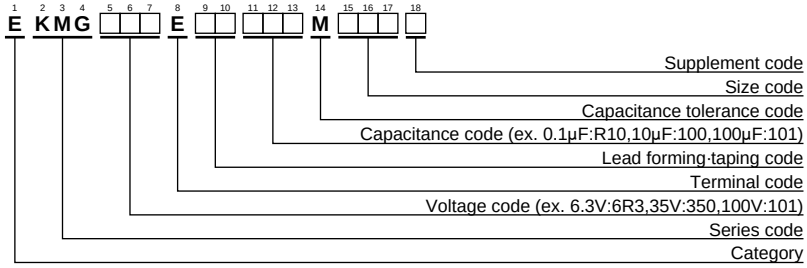
◆DIMENSIONS [mm]

●Terminal Code : E



φD	5	6.3	8	10	12.5	16	18
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φD'	φD+0.5max.						
L'	L+1.5max						

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Standard, Downsized, 105℃

KMG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
6.3	33	5×11	0.34	54	EKMG6R3E□□330ME11D
	47	5×11	0.34	64	EKMG6R3E□□470ME11D
	100	5×11	0.34	94	EKMG6R3E□□101ME11D
	220	5×11	0.34	140	EKMG6R3E□□221ME11D
	330	6.3×11	0.34	190	EKMG6R3E□□331MF11D
	470	6.3×11	0.34	230	EKMG6R3E□□471MF11D
	1,000	8×11.5	0.34	380	EKMG6R3E□□102MHB5D
	2,200	10×20	0.36	710	EKMG6R3E□□222MJ20S
	3,300	10×20	0.38	840	EKMG6R3E□□332MJ20S
	4,700	12.5×20	0.40	1,090	EKMG6R3E□□472MK20S
	6,800	12.5×25	0.44	1,350	EKMG6R3E□□682MK25S
	10,000	16×25	0.52	1,650	EKMG6R3E□□103ML25S
	15,000	16×35.5	0.62	2,010	EKMG6R3E□□153MLP1S
	22,000	18×40	0.76	2,350	EKMG6R3E□□223MM40S
10	22	5×11	0.24	46	EKMG100E□□220ME11D
	33	5×11	0.24	57	EKMG100E□□330ME11D
	47	5×11	0.24	68	EKMG100E□□470ME11D
	100	5×11	0.24	100	EKMG100E□□101ME11D
	220	6.3×11	0.24	170	EKMG100E□□221MF11D
	330	6.3×11	0.24	200	EKMG100E□□331MF11D
	470	8×11.5	0.24	250	EKMG100E□□471MHB5D
	1,000	10×12.5	0.24	460	EKMG100E□□102MJC5S
	2,200	10×20	0.26	760	EKMG100E□□222MJ20S
	3,300	12.5×20	0.28	1,000	EKMG100E□□332MK20S
	4,700	12.5×25	0.30	1,260	EKMG100E□□472MK25S
	6,800	16×25	0.34	1,570	EKMG100E□□682ML25S
	10,000	16×35.5	0.42	1,890	EKMG100E□□103MLP1S
	15,000	18×35.5	0.52	2,180	EKMG100E□□153MMP1S
16	10	5×11	0.20	34	EKMG160E□□100ME11D
	22	5×11	0.20	51	EKMG160E□□220ME11D
	33	5×11	0.20	63	EKMG160E□□330ME11D
	47	5×11	0.20	75	EKMG160E□□470ME11D
	100	5×11	0.20	110	EKMG160E□□101ME11D
	220	6.3×11	0.20	180	EKMG160E□□221MF11D
	330	8×11.5	0.20	260	EKMG160E□□331MHB5D
	470	8×11.5	0.20	310	EKMG160E□□471MHB5D
	1,000	10×16	0.20	560	EKMG160E□□102MJ16S
	2,200	12.5×20	0.22	920	EKMG160E□□222MK20S
	3,300	12.5×25	0.24	1,170	EKMG160E□□332MK25S
	4,700	16×25	0.26	1,480	EKMG160E□□472ML25S
	6,800	16×31.5	0.30	1,780	EKMG160E□□682MLN3S
	10,000	18×35.5	0.38	2,060	EKMG160E□□103MMP1S
25	4.7	5×11	0.16	25	EKMG250E□□4R7ME11D
	10	5×11	0.16	36	EKMG250E□□100ME11D
	22	5×11	0.16	54	EKMG250E□□220ME11D
	33	5×11	0.16	67	EKMG250E□□330ME11D
	47	5×11	0.16	80	EKMG250E□□470ME11D
	100	6.3×11	0.16	130	EKMG250E□□101MF11D
	220	8×11.5	0.16	230	EKMG250E□□221MHB5D
	330	8×11.5	0.16	310	EKMG250E□□331MHB5D
	470	10×12.5	0.16	380	EKMG250E□□471MJC5S
	1,000	10×20	0.16	680	EKMG250E□□102MJ20S
	2,200	12.5×25	0.18	1,090	EKMG250E□□222MK25S
	3,300	16×25	0.20	1,400	EKMG250E□□332ML25S
	4,700	16×31.5	0.22	1,710	EKMG250E□□472MLN3S
	6,800	18×35.5	0.26	2,040	EKMG250E□□682MMP1S
35	4.7	5×11	0.14	28	EKMG350E□□4R7ME11D
	10	5×11	0.14	41	EKMG350E□□100ME11D
	22	5×11	0.14	61	EKMG350E□□220ME11D
	33	5×11	0.14	75	EKMG350E□□330ME11D
	47	5×11	0.14	90	EKMG350E□□470ME11D
	100	6.3×11	0.14	150	EKMG350E□□101MF11D
	220	8×11.5	0.14	270	EKMG350E□□221MHB5D
	330	10×12.5	0.14	350	EKMG350E□□331MJC5S
	470	10×16	0.14	460	EKMG350E□□471MJ16S
	1,000	12.5×20	0.14	810	EKMG350E□□102MK20S
	2,200	16×25	0.16	1,260	EKMG350E□□222ML25S
35	3,300	16×35.5	0.18	1,610	EKMG350E□□332MLP1S
	4,700	18×35.5	0.20	1,910	EKMG350E□□472MMP1S
50	0.10	5×11	0.12	1.3	EKMG500E□□R10ME11D
	0.22	5×11	0.12	2.9	EKMG500E□□R22ME11D
	0.33	5×11	0.12	4.3	EKMG500E□□R33ME11D
	0.47	5×11	0.12	6.2	EKMG500E□□R47ME11D
	1.0	5×11	0.12	13	EKMG500E□□1R0ME11D
	2.2	5×11	0.12	20	EKMG500E□□2R2ME11D
	3.3	5×11	0.12	25	EKMG500E□□3R3ME11D
	4.7	5×11	0.12	30	EKMG500E□□4R7ME11D
	10	5×11	0.12	40	EKMG500E□□100ME11D
	22	5×11	0.12	65	EKMG500E□□220ME11D
	33	5×11	0.12	90	EKMG500E□□330ME11D
	47	6.3×11	0.12	110	EKMG500E□□470MF11D
	100	8×11.5	0.12	180	EKMG500E□□101MHB5D
	220	10×12.5	0.12	300	EKMG500E□□221MJC5S
	330	10×16	0.12	410	EKMG500E□□331MJ16S
	470	10×20	0.12	530	EKMG500E□□471MJ20S
	1,000	12.5×25	0.12	950	EKMG500E□□102MK25S
	2,200	16×35.5	0.14	1,470	EKMG500E□□222MLP1S
	3,300	18×35.5	0.16	1,770	EKMG500E□□332MMP1S
63	10	5×11	0.10	46	EKMG630E□□100ME11D
	22	5×11	0.10	71	EKMG630E□□220ME11D
	33	6.3×11	0.10	100	EKMG630E□□330MF11D
	47	6.3×11	0.10	120	EKMG630E□□470MF11D
	100	10×12.5	0.10	215	EKMG630E□□101MJC5S
	220	10×16	0.10	335	EKMG630E□□221MJ16S
	330	10×20	0.10	510	EKMG630E□□331MJ20S
	470	12.5×20	0.10	640	EKMG630E□□471MK20S
	1,000	16×25	0.10	930	EKMG630E□□102ML25S
100	0.10	5×11	0.08	1.5	EKMG101E□□R10ME11D
	0.22	5×11	0.08	3.4	EKMG101E□□R22ME11D
	0.33	5×11	0.08	5.0	EKMG101E□□R33ME11D
	0.47	5×11	0.08	7.1	EKMG101E□□R47ME11D
	1.0	5×11	0.08	15	EKMG101E□□1R0ME11D
	2.2	5×11	0.08	21	EKMG101E□□2R2ME11D
	3.3	5×11	0.08	29	EKMG101E□□3R3ME11D
	4.7	5×11	0.08	32	EKMG101E□□4R7ME11D
	10	6.3×11	0.08	54	EKMG101E□□100MF11D
	22	8×11.5	0.08	93	EKMG101E□□220MHB5D
	33	8×11.5	0.08	130	EKMG101E□□330MHB5D
	47	10×12.5	0.08	165	EKMG101E□□470MJC5S
	100	10×20	0.08	265	EKMG101E□□101MJ20S
	220	12.5×25	0.08	440	EKMG101E□□221MK25S
	330	16×25	0.08	540	EKMG101E□□331ML25S
	470	16×31.5	0.08	715	EKMG101E□□471MLN3S
	1,000	18×40	0.08	985	EKMG101E□□102MM40S
160	3.3	6.3×11	0.20	28	EKMG161E□□3R3MF11D
	4.7	6.3×11	0.20	34	EKMG161E□□4R7MF11D
	10	10×12.5	0.20	67	EKMG161E□□100MJC5S
	22	10×20	0.20	120	EKMG161E□□220MJ20S
	33	10×20	0.20	145	EKMG161E□□330MJ20S
	47	12.5×20	0.20	195	EKMG161E□□470MK20S
	100	16×25	0.20	335	EKMG161E□□101ML25S
	220	16×31.5	0.20	540	EKMG161E□□221MLN3S
	330	18×35.5	0.20	705	EKMG161E□□331MMP1S
200	3.3	6.3×11	0.20	28	EKMG201E□□3R3MF11D
	4.7	8×11.5	0.20	39	EKMG201E□□4R7MHB5D
	10	10×16	0.20	74	EKMG201E□□100MJ16S
	22	10×20	0.20	120	EKMG201E□□220MJ20S
	33	12.5×20	0.20	160	EKMG201E□□330MK20S
	47	12.5×20	0.20	195	EKMG201E□□470MK20S
	100	16×25	0.20	335	EKMG201E□□101ML25S
	220	18×35.5	0.20	575	EKMG201E□□221MMP1S
250	2.2	6.3×11	0.20	23	EKMG251E□□2R2MF11D
	3.3	8×11.5	0.20	32	EKMG251E□□3R3MHB5D
	4.7	8×11.5	0.20	39	EKMG251E□□4R7MHB5D

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Standard, Downsized, 105℃

KMG Series

◆STANDARD RATINGS

is non solvent-proof.

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 105℃,120Hz)	Part No.
250	10	10×16	0.20	74	EKMG251E□□100MJ16S
	22	12.5×20	0.20	130	EKMG251E□□220MK20S
	33	12.5×20	0.20	160	EKMG251E□□330MK20S
	47	12.5×25	0.20	210	EKMG251E□□470MK25S
	100	16×31.5	0.20	365	EKMG251E□□101MLN3S
	220	18×40	0.20	585	EKMG251E□□221MM40S
350	0.47	6.3×11	0.24	11	EKMG351E□□R47MF11D
	1.0	6.3×11	0.24	15	EKMG351E□□1R0MF11D
	2.2	8×11.5	0.24	26	EKMG351E□□2R2MHB5D
	3.3	10×12.5	0.24	38	EKMG351E□□3R3MJC5S
	4.7	10×16	0.24	50	EKMG351E□□4R7MJ16S
	10	10×20	0.24	80	EKMG351E□□100MJ20S
	22	12.5×20	0.24	130	EKMG351E□□220MK20S
	33	16×25	0.24	195	EKMG351E□□330ML25S
	47	16×25	0.24	230	EKMG351E□□470ML25S
	100	18×31.5	0.24	375	EKMG351E□□101MMN3S

□□ : Fill with appropriate lead forming or taping code.

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 105℃,120Hz)	Part No.
400	1.0	6.3×11	0.24	15	EKMG401E□□1R0MF11D
	2.2	8×11.5	0.24	26	EKMG401E□□2R2MHB5D
	3.3	10×12.5	0.24	38	EKMG401E□□3R3MJC5S
	4.7	10×16	0.24	50	EKMG401E□□4R7MJ16S
	10	10×20	0.24	80	EKMG401E□□100MJ20S
	22	12.5×25	0.24	145	EKMG401E□□220MK25S
	33	16×25	0.24	195	EKMG401E□□330ML25S
	47	16×31.5	0.24	250	EKMG401E□□470MLN3S
	100	16×40	0.24	350	EKMG401E□□101ML40S
450	0.47	10×12.5	0.24	9.0	EKMG451E□□R47MJC5S
	1.0	10×12.5	0.24	13	EKMG451E□□1R0MJC5S
	2.2	10×12.5	0.24	23	EKMG451E□□2R2MJC5S
	3.3	10×16	0.24	31	EKMG451E□□3R3MJ16S
	4.7	10×20	0.24	40	EKMG451E□□4R7MJ20S
	10	12.5×20	0.24	65	EKMG451E□□100MK20S
	22	16×25	0.24	115	EKMG451E□□220ML25S
	33	16×31.5	0.24	155	EKMG451E□□330MLN3S
	47	16×35.5	0.24	185	EKMG451E□□470MLP1S

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	50	120	300	1k	10k	100k
0.1 to 4.7	0.65	1.00	1.35	1.75	2.30	2.50
10 to 47	0.75	1.00	1.25	1.50	1.75	1.80
100 to 1,000	0.80	1.00	1.15	1.30	1.40	1.50
2,200 to	0.85	1.00	1.03	1.05	1.08	1.08

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Bi-polarized, 85℃

SME-BP Series

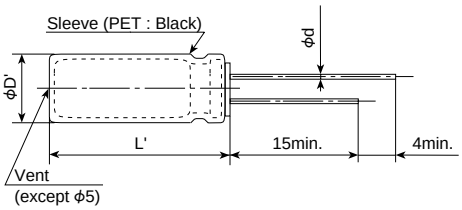
- Standard Bi-polarized type
- Endurance : 2,000 hours at 85℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

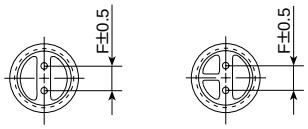
◆SPECIFICATIONS

Items	Characteristics									
Category Temperature Range	−40 to +85℃									
Rated Voltage Range	6.3 to 100Vdc									
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)									
Leakage Current	I=0.06CV or 10μA, whichever is greater. (at 20℃ after 2 minutes) I=0.03CV or 3μA, whichever is greater. (at 20℃ after 5 minutes) Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)									
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	80V	100V
	tanδ (Max.)	0.24	0.24	0.20	0.20	0.16	0.14	0.12	0.12	0.10
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)									
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	80V	100V
	Z(−25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	2
	Z(−40℃)/Z(+20℃)	10	8	6	4	3	3	3	3	3 (at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 2,000 hours at 85℃, however the polarization shall be reversed every 250 hours.									
	Rated voltage	6.3 to 16Vdc				25 to 100Vdc				
	Capacitance change	≦±25% of the initial value				≦±20% of the initial value				
	D.F. (tanδ)	≦150% 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.									
	Rated voltage	6.3 to 16Vdc				25 to 100Vdc				
	Capacitance change	≦±25% of the initial value				≦±20% of the initial value				
	D.F. (tanδ)	≦150% of the initial specified value								
	Leakage current	≦The initial specified value								

◆DIMENSIONS [mm]

●Terminal Code : E



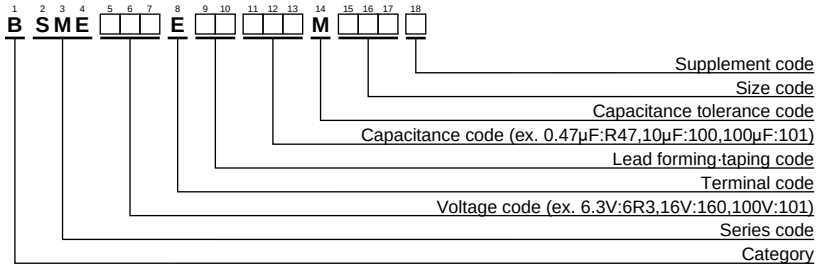


(φ5 to φ10) (φ12.5 to φ18)

Gas escape end seal

φD	5	6.3	8	10	12.5	16	18
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φD'	φD+0.5max.						
L'	L+1.5max.						

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Bi-polarized, 85℃

SME-BP Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
6.3	33	5×11	0.24	64	BSME6R3E□□330ME11D
	47	5×11	0.24	76	BSME6R3E□□470ME11D
	100	6.3×11	0.24	125	BSME6R3E□□101MF11D
	220	8×11.5	0.24	215	BSME6R3E□□221MHB5D
	330	8×11.5	0.24	265	BSME6R3E□□331MHB5D
	470	10×12.5	0.24	370	BSME6R3E□□471MJC5S
	1,000	10×20	0.24	650	BSME6R3E□□102MJ20S
	2,200	12.5×25	0.26	1,160	BSME6R3E□□222MK25S
	3,300	16×25	0.28	1,570	BSME6R3E□□332ML25S
	4,700	16×31.5	0.30	2,020	BSME6R3E□□472MLN3S
	6,800	18×35.5	0.34	2,600	BSME6R3E□□682MMP1S
10	22	5×11	0.24	57	BSME100E□□220ME11D
	33	5×11	0.24	64	BSME100E□□330ME11D
	47	5×11	0.24	76	BSME100E□□470ME11D
	100	6.3×11	0.24	125	BSME100E□□101MF11D
	220	8×11.5	0.24	215	BSME100E□□221MHB5D
	330	10×16	0.24	345	BSME100E□□331MJ16S
	470	10×16	0.24	410	BSME100E□□471MJ16S
	1,000	12.5×20	0.24	720	BSME100E□□102MK20S
	2,200	16×25	0.26	1,280	BSME100E□□222ML25S
	3,300	16×31.5	0.28	1,690	BSME100E□□332MLN3S
	4,700	18×35.5	0.30	2,160	BSME100E□□472MMP1S
16	10	5×11	0.20	42	BSME160E□□100ME11D
	22	5×11	0.20	57	BSME160E□□220ME11D
	33	5×11	0.20	70	BSME160E□□330ME11D
	47	6.3×11	0.20	95	BSME160E□□470MF11D
	100	8×11.5	0.20	160	BSME160E□□101MHB5D
	220	10×12.5	0.20	275	BSME160E□□221MJC5S
	330	10×16	0.20	375	BSME160E□□331MJ16S
	470	10×20	0.20	485	BSME160E□□471MJ20S
	1,000	12.5×25	0.20	855	BSME160E□□102MK25S
	2,200	16×31.5	0.22	1,510	BSME160E□□222MLN3S
	3,300	18×35.5	0.24	1,980	BSME160E□□332MMP1S
25	10	5×11	0.20	42	BSME250E□□100ME11D
	22	6.3×11	0.20	65	BSME250E□□220MF11D
	33	6.3×11	0.20	80	BSME250E□□330MF11D
	47	6.3×11	0.20	95	BSME250E□□470MF11D
	100	8×11.5	0.20	160	BSME250E□□101MHB5D
	220	10×16	0.20	305	BSME250E□□221MJ16S
	330	12.5×20	0.20	450	BSME250E□□331MK20S
	470	12.5×20	0.20	540	BSME250E□□471MK20S
	1,000	16×25	0.20	950	BSME250E□□102ML25S
	2,200	18×35.5	0.22	1,620	BSME250E□□222MMP1S
35	4.7	5×11	0.16	34	BSME350E□□4R7ME11D
	10	5×11	0.16	43	BSME350E□□100ME11D
	22	6.3×11	0.16	73	BSME350E□□220MF11D
	33	8×11.5	0.16	100	BSME350E□□330MHB5D
	47	8×11.5	0.16	120	BSME350E□□470MHB5D
	100	10×16	0.16	230	BSME350E□□101MJ16S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
35	220	12.5×20	0.16	410	BSME350E□□221MK20S
	330	12.5×20	0.16	505	BSME350E□□331MK20S
	470	12.5×25	0.16	655	BSME350E□□471MK25S
	1,000	16×31.5	0.16	1,140	BSME350E□□102MLN3S
50	0.47	5×11	0.14	11	BSME500E□□R47ME11D
	1.0	5×11	0.14	17	BSME500E□□1R0ME11D
	2.2	5×11	0.14	25	BSME500E□□2R2ME11D
	3.3	5×11	0.14	27	BSME500E□□3R3ME11D
	4.7	5×11	0.14	34	BSME500E□□4R7ME11D
	10	6.3×11	0.14	52	BSME500E□□100MF11D
	22	8×11.5	0.14	89	BSME500E□□220MHB5D
	33	8×11.5	0.14	105	BSME500E□□330MHB5D
	47	10×12.5	0.14	150	BSME500E□□470MJC5S
	100	10×20	0.14	265	BSME500E□□101MJ20S
	220	12.5×25	0.14	480	BSME500E□□221MK25S
	330	16×25	0.14	650	BSME500E□□331ML25S
	470	16×31.5	0.14	835	BSME500E□□471MLN3S
63	3.3	5×11	0.12	28	BSME630E□□3R3ME11D
	4.7	6.3×11	0.12	34	BSME630E□□4R7MF11D
	10	6.3×11	0.12	57	BSME630E□□100MF11D
	22	8×11.5	0.12	95	BSME630E□□220MHB5D
	33	10×12.5	0.12	135	BSME630E□□330MJC5S
	47	10×16	0.12	180	BSME630E□□470MJ16S
	100	12.5×20	0.12	320	BSME630E□□101MK20S
	220	16×25	0.12	575	BSME630E□□221ML25S
	330	16×31.5	0.12	655	BSME630E□□331MLN3S
	470	18×35.5	0.12	965	BSME630E□□471MMP1S
80	2.2	5×11	0.12	29	BSME800E□□2R2ME11D
	3.3	6.3×11	0.12	39	BSME800E□□3R3MF11D
	4.7	6.3×11	0.12	47	BSME800E□□4R7MF11D
	10	8×11.5	0.12	65	BSME800E□□100MHB5D
	22	10×16	0.12	125	BSME800E□□220MJ16S
	33	10×16	0.12	150	BSME800E□□330MJ16S
	47	10×20	0.12	195	BSME800E□□470MJ20S
	100	12.5×25	0.12	350	BSME800E□□101MK25S
	220	16×31.5	0.12	615	BSME800E□□221MLN3S
	330	18×35.5	0.12	755	BSME800E□□331MMP1S
100	0.47	5×11	0.10	14	BSME101E□□R47ME11D
	1.0	5×11	0.10	21	BSME101E□□1R0ME11D
	2.2	6.3×11	0.10	34	BSME101E□□2R2MF11D
	3.3	6.3×11	0.10	39	BSME101E□□3R3MF11D
	4.7	6.3×11	0.10	47	BSME101E□□4R7MF11D
	10	8×11.5	0.10	71	BSME101E□□100MHB5D
	22	10×16	0.10	135	BSME101E□□220MJ16S
	33	12.5×20	0.10	220	BSME101E□□330MK20S
	47	12.5×20	0.10	240	BSME101E□□470MK20S
	100	16×25	0.10	425	BSME101E□□101ML25S
	220	18×35.5	0.10	720	BSME101E□□221MMP1S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Bi-polarized, 105℃

KME-BP Series

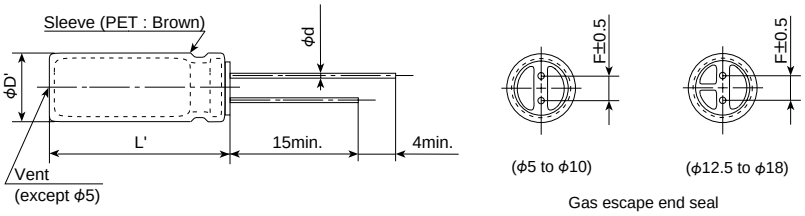
- Standard Bi-polarized type
- Endurance : 1,000 hours at 105℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

◆SPECIFICATIONS

Items	Characteristics									
Category Temperature Range	−55 to +105℃									
Rated Voltage Range	6.3 to 100Vdc									
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)									
Leakage Current	I=0.06CV or 10μA, whichever is greater. (at 20℃ after 2 minutes) I=0.03CV or 3μA, whichever is greater. (at 20℃ after 5 minutes) Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)									
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	80V	100V
	tanδ (Max.)	0.24	0.24	0.20	0.20	0.16	0.14	0.12	0.12	0.10
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)									
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	80V	100V
	Z(−25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	2
	Z(−40℃)/Z(+20℃)	10	8	6	4	3	3	3	3	3 (at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 1,000 hours at 105℃, however the polarization shall be reversed every 250 hours.									
	Rated voltage	6.3 to 16Vdc	25 to 100Vdc							
	Capacitance change	≦±25% of the initial value	≦±20% of the initial value							
	D.F. (tanδ)	≦150% 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.									
	Rated voltage	6.3 to 16Vdc	25 to 100Vdc							
	Capacitance change	≦±25% of the initial value	≦±20% of the initial value							
	D.F. (tanδ)	≦150% of the initial specified value								
	Leakage current	≦The initial specified value								

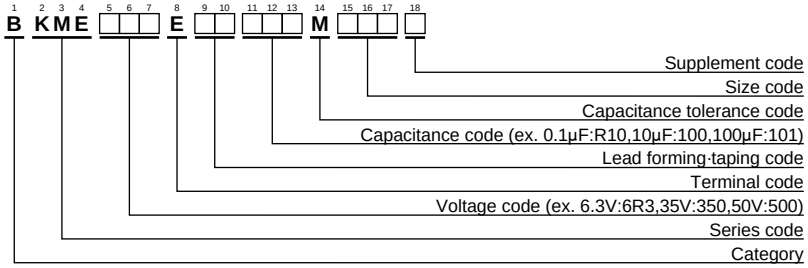
◆DIMENSIONS [mm]

- Terminal Code : E



φD	5	6.3	8	10	12.5	16	18
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φD'	φD+0.5max.						
L'	L+1.5max.						

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Bi-polarized, 105℃

KME-BP Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
6.3	33	5×11	0.24	45	BKME6R3E□□330ME11D
	47	5×11	0.24	54	BKME6R3E□□470ME11D
	100	6.3×11	0.24	90	BKME6R3E□□101MF11D
	220	8×11.5	0.24	150	BKME6R3E□□221MHB5D
	330	8×11.5	0.24	185	BKME6R3E□□331MHB5D
	470	10×12.5	0.24	260	BKME6R3E□□471MJC5S
	1,000	10×20	0.24	460	BKME6R3E□□102MJ20S
	2,200	12.5×25	0.26	820	BKME6R3E□□222MK25S
	3,300	16×25	0.28	1,110	BKME6R3E□□332ML25S
	4,700	16×31.5	0.30	1,430	BKME6R3E□□472MLN3S
	6,800	18×35.5	0.34	1,830	BKME6R3E□□682MMP1S
10	22	5×11	0.24	37	BKME100E□□220ME11D
	33	5×11	0.24	45	BKME100E□□330ME11D
	47	5×11	0.24	54	BKME100E□□470ME11D
	100	6.3×11	0.24	90	BKME100E□□101MF11D
	220	8×11.5	0.24	150	BKME100E□□221MHB5D
	330	10×16	0.24	240	BKME100E□□331MJ16S
	470	10×16	0.24	290	BKME100E□□471MJ16S
	1,000	12.5×20	0.24	510	BKME100E□□102MK20S
	2,200	16×25	0.26	910	BKME100E□□222ML25S
	3,300	16×31.5	0.28	1,200	BKME100E□□332MLN3S
	4,700	18×35.5	0.30	1,520	BKME100E□□472MMP1S
16	10	5×11	0.20	27	BKME160E□□100ME11D
	22	5×11	0.20	40	BKME160E□□220ME11D
	33	5×11	0.20	49	BKME160E□□330ME11D
	47	6.3×11	0.20	67	BKME160E□□470MF11D
	100	8×11.5	0.20	110	BKME160E□□101MHB5D
	220	10×12.5	0.20	195	BKME160E□□221MJC5S
	330	10×16	0.20	265	BKME160E□□331MJ16S
	470	10×20	0.20	345	BKME160E□□471MJ20S
	1,000	12.5×25	0.20	605	BKME160E□□102MK25S
	2,200	16×31.5	0.22	1,070	BKME160E□□222MLN3S
	3,300	18×35.5	0.24	1,400	BKME160E□□332MMP1S
25	10	5×11	0.20	27	BKME250E□□100ME11D
	22	6.3×11	0.20	46	BKME250E□□220MF11D
	33	6.3×11	0.20	56	BKME250E□□330MF11D
	47	6.3×11	0.20	67	BKME250E□□470MF11D
	100	8×11.5	0.20	110	BKME250E□□101MHB5D
	220	10×16	0.20	215	BKME250E□□221MJ16S
	330	12.5×20	0.20	320	BKME250E□□331MK20S
	470	12.5×20	0.20	380	BKME250E□□471MK20S
	1,000	16×25	0.20	670	BKME250E□□102ML25S
	2,200	18×35.5	0.22	1,140	BKME250E□□222MMP1S
35	4.7	5×11	0.16	21	BKME350E□□4R7ME11D
	10	5×11	0.16	30	BKME350E□□100ME11D
	22	6.3×11	0.16	51	BKME350E□□220MF11D
	33	8×11.5	0.16	72	BKME350E□□330MHB5D
	47	8×11.5	0.16	86	BKME350E□□470MHB5D
	100	10×16	0.16	160	BKME350E□□101MJ16S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
35	220	12.5×20	0.16	290	BKME350E□□221MK20S
	330	12.5×20	0.16	350	BKME350E□□331MK20S
	470	12.5×25	0.16	465	BKME350E□□471MK25S
	1,000	16×31.5	0.16	805	BKME350E□□102MLN3S
50	0.47	5×11	0.14	7.0	BKME500E□□R47ME11D
	1.0	5×11	0.14	10	BKME500E□□1R0ME11D
	2.2	5×11	0.14	15	BKME500E□□2R2ME11D
	3.3	5×11	0.14	18	BKME500E□□3R3ME11D
	4.7	5×11	0.14	22	BKME500E□□4R7ME11D
	10	6.3×11	0.14	37	BKME500E□□100MF11D
	22	8×11.5	0.14	63	BKME500E□□220MHB5D
	33	8×11.5	0.14	77	BKME500E□□330MHB5D
	47	10×12.5	0.14	105	BKME500E□□470MJC5S
	100	10×20	0.14	190	BKME500E□□101MJ20S
	220	12.5×25	0.14	340	BKME500E□□221MK25S
	330	16×25	0.14	460	BKME500E□□331ML25S
	470	16×31.5	0.14	590	BKME500E□□471MLN3S
63	3.3	5×11	0.12	20	BKME630E□□3R3ME11D
	4.7	6.3×11	0.12	24	BKME630E□□4R7MF11D
	10	6.3×11	0.12	40	BKME630E□□100MF11D
	22	8×11.5	0.12	68	BKME630E□□220MHB5D
	33	10×12.5	0.12	98	BKME630E□□330MJC5S
	47	10×16	0.12	130	BKME630E□□470MJ16S
	100	12.5×20	0.12	225	BKME630E□□101MK20S
	220	16×25	0.12	405	BKME630E□□221ML25S
	330	16×31.5	0.12	535	BKME630E□□331MLN3S
	470	18×35.5	0.12	680	BKME630E□□471MMP1S
80	2.2	5×11	0.12	16	BKME800E□□2R2ME11D
	3.3	6.3×11	0.12	23	BKME800E□□3R3MF11D
	4.7	6.3×11	0.12	27	BKME800E□□4R7MF11D
	10	8×11.5	0.12	46	BKME800E□□100MHB5D
	22	10×16	0.12	89	BKME800E□□220MJ16S
	33	10×16	0.12	105	BKME800E□□330MJ16S
	47	10×20	0.12	140	BKME800E□□470MJ20S
	100	12.5×25	0.12	245	BKME800E□□101MK25S
	220	16×31.5	0.12	435	BKME800E□□221MLN3S
	330	18×35.5	0.12	570	BKME800E□□331MMP1S
100	0.47	5×11	0.10	8.0	BKME101E□□R47ME11D
	1.0	5×11	0.10	12	BKME101E□□1R0ME11D
	2.2	6.3×11	0.10	20	BKME101E□□2R2MF11D
	3.3	6.3×11	0.10	25	BKME101E□□3R3MF11D
	4.7	6.3×11	0.10	30	BKME101E□□4R7MF11D
	10	8×11.5	0.10	50	BKME101E□□100MHB5D
	22	10×16	0.10	97	BKME101E□□220MJ16S
	33	12.5×20	0.10	140	BKME101E□□330MK20S
	47	12.5×20	0.10	170	BKME101E□□470MK20S
	100	16×25	0.10	300	BKME101E□□101ML25S
	220	18×35.5	0.10	510	BKME101E□□221MMP1S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KZM Series

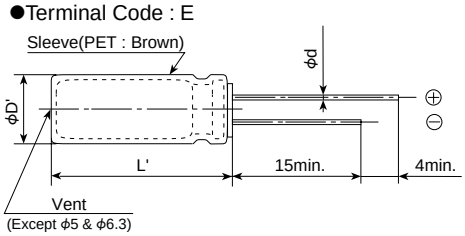
- Long-Life version of KZH series
- Endurance with ripple current : 6,000 to 10,000 hours at 105℃
- Newly innovative electrolyte is employed to minimize ESR
- Rated voltage range : 6.3 to 50V, Nominal capacitance range : 27 to 10,000μF
- Non solvent-proof
- **RoHS Compliant**

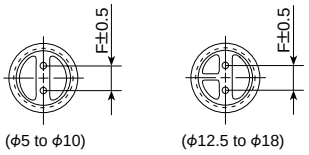
◆SPECIFICATIONS

Items	Characteristics						
Category Temperature Range	−40 to +105℃						
Rated Voltage Range	6.3 to 50Vdc						
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)						
Leakage Current	I=0.01CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)						
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V
	tanδ (Max.)	0.22	0.19	0.16	0.14	0.12	0.10
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)						
Low Temperature Characteristics	Z(−25℃)/Z(+20℃)	2 max.					
	Z(−40℃)/Z(+20℃)	3 max.					(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 the specified period of time at 105℃.						
	Time	φ5 & φ6.3 : 6,000hours φ8 & φ10×12.5 : 8,000hours φ10×16 to φ18 : 10,000hours					
	Capacitance change	≦±25% of the initial value (6.3, 10V : ≦±30%)					
	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	≦±25% of the initial value (6.3, 10V : ≦±30%)					
	D.F. (tanδ)	≦200% of the initial specified value					
	Leakage current	≦The initial specified value					

◆DIMENSIONS [mm]

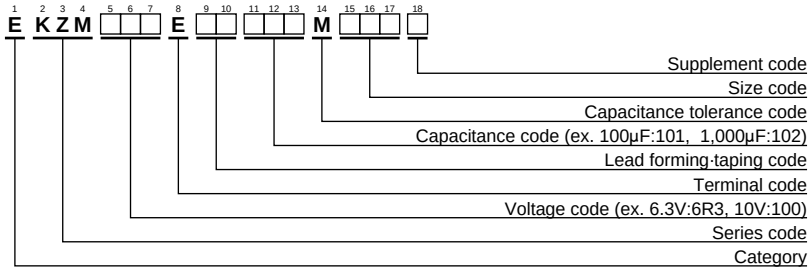
- Terminal Code : E





φD	5	6.3	8	10	12.5	16	18
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φD'	φD+0.5max.						
L'	L+1.5max.						

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

◆RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
27 to 180	0.40	0.75	0.90	1.00
220 to 560	0.50	0.85	0.94	1.00
680 to 1,800	0.60	0.87	0.95	1.00
2,200 to 3,900	0.75	0.90	0.95	1.00
4,700 to 10,000	0.85	0.95	0.98	1.00

Note : The endurance of capacitors is shorted with internal heating produced by ripple currents 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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KZM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Impedance (Ωmax/100kHz)		Rated ripple current (mArms/105℃,100kHz)	Part No.
				20℃	-10℃		
6.3	220	5 × 11	0.22	0.22	0.80	345	EKZM6R3E□□221ME11D
	470	6.3 × 11	0.22	0.094	0.35	540	EKZM6R3E□□471MF11D
	820	8 × 11.5	0.22	0.056	0.19	945	EKZM6R3E□□821MHB5D
	1,200	8 × 15	0.22	0.045	0.15	1,250	EKZM6R3E□□122MH15D
	1,200	10 × 12.5	0.22	0.039	0.14	1,330	EKZM6R3E□□122MJC5S
	1,500	8 × 20	0.22	0.029	0.11	1,500	EKZM6R3E□□152MH20D
	1,800	10 × 16	0.22	0.028	0.10	1,760	EKZM6R3E□□182MJ16S
	2,200	10 × 20	0.24	0.020	0.060	1,960	EKZM6R3E□□222MJ20S
	2,700	10 × 25	0.24	0.018	0.054	2,250	EKZM6R3E□□272MJ25S
	3,900	12.5 × 20	0.26	0.017	0.043	2,480	EKZM6R3E□□392MK20S
	4,700	12.5 × 25	0.28	0.015	0.038	2,900	EKZM6R3E□□472MK25S
	5,600	12.5 × 30	0.30	0.013	0.033	3,450	EKZM6R3E□□562MK30S
	6,800	12.5 × 35	0.32	0.012	0.031	3,570	EKZM6R3E□□682MK35S
	6,800	16 × 20	0.32	0.015	0.038	3,250	EKZM6R3E□□682ML20S
	8,200	16 × 25	0.36	0.013	0.035	3,630	EKZM6R3E□□822ML25S
	10,000	18 × 25	0.40	0.012	0.031	3,650	EKZM6R3E□□103MM25S
10	150	5 × 11	0.19	0.22	0.80	345	EKZM100E□□151ME11D
	330	6.3 × 11	0.19	0.094	0.35	540	EKZM100E□□331MF11D
	680	8 × 11.5	0.19	0.056	0.19	945	EKZM100E□□681MHB5D
	1,000	8 × 15	0.19	0.045	0.15	1,250	EKZM100E□□102MH15D
	1,000	10 × 12.5	0.19	0.039	0.14	1,330	EKZM100E□□102MJC5S
	1,500	8 × 20	0.19	0.029	0.11	1,500	EKZM100E□□152MH20D
	1,500	10 × 16	0.19	0.028	0.10	1,760	EKZM100E□□152MJ16S
	1,800	10 × 20	0.19	0.020	0.060	1,960	EKZM100E□□182MJ20S
	2,200	10 × 25	0.21	0.018	0.054	2,250	EKZM100E□□222MJ25S
	3,300	12.5 × 20	0.23	0.017	0.043	2,480	EKZM100E□□332MK20S
	3,900	12.5 × 25	0.23	0.015	0.038	2,900	EKZM100E□□392MK25S
	4,700	12.5 × 30	0.25	0.013	0.033	3,450	EKZM100E□□472MK30S
	4,700	16 × 20	0.25	0.015	0.038	3,250	EKZM100E□□472ML20S
	5,600	12.5 × 35	0.27	0.012	0.031	3,570	EKZM100E□□562MK35S
	6,800	16 × 25	0.29	0.013	0.035	3,630	EKZM100E□□682ML25S
	8,200	18 × 25	0.33	0.012	0.031	3,650	EKZM100E□□822MM25S
16	100	5 × 11	0.16	0.22	0.80	345	EKZM160E□□101ME11D
	220	6.3 × 11	0.16	0.094	0.35	540	EKZM160E□□221MF11D
	470	8 × 11.5	0.16	0.056	0.19	945	EKZM160E□□471MHB5D
	680	8 × 15	0.16	0.045	0.15	1,250	EKZM160E□□681MH15D
	680	10 × 12.5	0.16	0.039	0.14	1,330	EKZM160E□□681MJC5S
	1,000	8 × 20	0.16	0.029	0.11	1,500	EKZM160E□□102MH20D
	1,000	10 × 16	0.16	0.028	0.10	1,760	EKZM160E□□102MJ16S
	1,500	10 × 20	0.16	0.020	0.060	1,960	EKZM160E□□152MJ20S
	1,800	10 × 25	0.16	0.018	0.054	2,250	EKZM160E□□182MJ25S
	2,200	12.5 × 20	0.18	0.017	0.043	2,480	EKZM160E□□222MK20S
	2,700	12.5 × 25	0.18	0.015	0.038	2,900	EKZM160E□□272MK25S
	3,300	12.5 × 30	0.20	0.013	0.033	3,450	EKZM160E□□332MK30S
	3,300	16 × 20	0.20	0.015	0.038	3,250	EKZM160E□□332ML20S
	3,900	12.5 × 35	0.20	0.012	0.031	3,570	EKZM160E□□392MK35S
	4,700	16 × 25	0.22	0.013	0.035	3,630	EKZM160E□□472ML25S
	5,600	18 × 25	0.24	0.012	0.031	3,650	EKZM160E□□562MM25S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KZM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Impedance (Ωmax/100kHz)		Rated ripple current (mArms/105℃,100kHz)	Part No.
				20℃	-10℃		
25	68	5 × 11	0.14	0.22	0.80	345	EKZM250E□□680ME11D
	150	6.3 × 11	0.14	0.094	0.35	540	EKZM250E□□151MF11D
	330	8 × 11.5	0.14	0.056	0.19	945	EKZM250E□□331MHB5D
	390	8 × 15	0.14	0.045	0.15	1,250	EKZM250E□□391MH15D
	470	10 × 12.5	0.14	0.039	0.14	1,330	EKZM250E□□471MJC5S
	560	8 × 20	0.14	0.029	0.11	1,500	EKZM250E□□561MH20D
	680	10 × 16	0.14	0.028	0.10	1,760	EKZM250E□□681MJ16S
	820	10 × 20	0.14	0.020	0.060	1,960	EKZM250E□□821MJ20S
	1,000	10 × 25	0.14	0.018	0.054	2,250	EKZM250E□□102MJ25S
	1,500	12.5 × 20	0.14	0.017	0.043	2,480	EKZM250E□□152MK20S
	1,800	12.5 × 25	0.14	0.015	0.038	2,900	EKZM250E□□182MK25S
	2,200	12.5 × 30	0.16	0.013	0.033	3,450	EKZM250E□□222MK30S
	2,200	16 × 20	0.16	0.015	0.038	3,250	EKZM250E□□222ML20S
	2,700	12.5 × 35	0.16	0.012	0.031	3,570	EKZM250E□□272MK35S
	3,300	16 × 25	0.18	0.013	0.035	3,630	EKZM250E□□332ML25S
	3,900	18 × 25	0.18	0.012	0.031	3,650	EKZM250E□□392MM25S
35	47	5 × 11	0.12	0.22	0.80	345	EKZM350E□□470ME11D
	100	6.3 × 11	0.12	0.094	0.35	540	EKZM350E□□101MF11D
	220	8 × 11.5	0.12	0.056	0.19	945	EKZM350E□□221MHB5D
	270	8 × 15	0.12	0.045	0.15	1,250	EKZM350E□□271MH15D
	330	10 × 12.5	0.12	0.039	0.14	1,330	EKZM350E□□331MJC5S
	390	8 × 20	0.12	0.029	0.11	1,500	EKZM350E□□391MH20D
	470	10 × 16	0.12	0.028	0.10	1,760	EKZM350E□□471MJ16S
	560	10 × 20	0.12	0.020	0.060	1,960	EKZM350E□□561MJ20S
	680	10 × 25	0.12	0.018	0.054	2,250	EKZM350E□□681MJ25S
	1,000	12.5 × 20	0.12	0.017	0.043	2,480	EKZM350E□□102MK20S
	1,200	12.5 × 25	0.12	0.015	0.038	2,900	EKZM350E□□122MK25S
	1,500	12.5 × 30	0.12	0.013	0.033	3,450	EKZM350E□□152MK30S
	1,500	16 × 20	0.12	0.015	0.038	3,250	EKZM350E□□152ML20S
	1,800	12.5 × 35	0.12	0.012	0.031	3,570	EKZM350E□□182MK35S
	2,200	16 × 25	0.14	0.013	0.035	3,630	EKZM350E□□222ML25S
	2,700	18 × 25	0.14	0.012	0.031	3,650	EKZM350E□□272MM25S
50	27	5 × 11	0.10	0.34	1.18	238	EKZM500E□□270ME11D
	56	6.3 × 11	0.10	0.14	0.50	385	EKZM500E□□560MF11D
	100	8 × 11.5	0.10	0.074	0.22	724	EKZM500E□□101MHB5D
	120	8 × 15	0.10	0.061	0.18	950	EKZM500E□□121MH15D
	150	10 × 12.5	0.10	0.061	0.18	979	EKZM500E□□151MJC5S
	180	8 × 20	0.10	0.046	0.14	1,190	EKZM500E□□181MH20D
	220	10 × 16	0.10	0.042	0.12	1,370	EKZM500E□□221MJ16S
	270	10 × 20	0.10	0.030	0.090	1,580	EKZM500E□□271MJ20S
	330	10 × 25	0.10	0.028	0.085	1,870	EKZM500E□□331MJ25S
	470	12.5 × 20	0.10	0.027	0.068	2,050	EKZM500E□□471MK20S
	560	12.5 × 25	0.10	0.023	0.059	2,410	EKZM500E□□561MK25S
	680	12.5 × 30	0.10	0.021	0.052	2,860	EKZM500E□□681MK30S
	820	12.5 × 35	0.10	0.019	0.051	2,960	EKZM500E□□821MK35S
	820	16 × 20	0.10	0.023	0.059	2,730	EKZM500E□□821ML20S
	1,000	16 × 25	0.10	0.021	0.056	3,010	EKZM500E□□102ML25S
	1,500	18 × 25	0.10	0.019	0.051	3,290	EKZM500E□□152MM25S

□□ : Fill with appropriate lead forming or taping code.

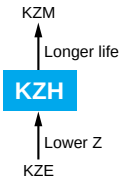
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KZH Series

- Ultra Low impedance for Personal Computer and Storage Equipment
- Endurance with ripple current: 5,000 to 6,000 hours at 105℃
- Non solvent-proof type
- **RoHS Compliant**

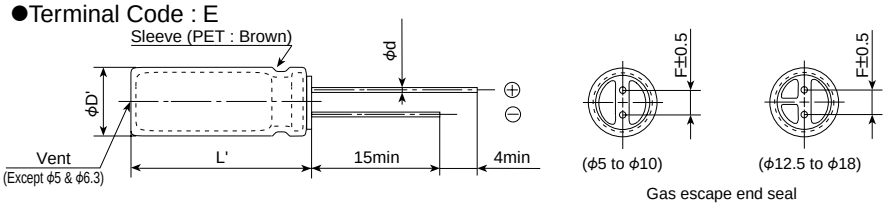


◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−40 to +105℃
Rated Voltage Range	6.3 to 35Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc) 6.3V 10V 16V 25V 35V tanδ (Max.) 0.22 0.19 0.16 0.14 0.12 When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Z (-25℃) / Z (+20℃) 2max. Z (-40℃) / Z (+20℃) 3max. (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 the specified period of time at 105℃. Time: φ5 & φ6.3 : 5,000hours φ8 to φ16 : 6,000hours Capacitance change: ≦±25% of the initial value (6.3, 10V : ≦±30%) 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: ≦±25% of the initial value (6.3, 10V : ≦±30%) D.F. (tanδ): ≦200% of the initial specified value Leakage current: ≦The initial specified value

◆DIMENSIONS [mm]

●Terminal Code : E



φD	5	6.3	8	10	12.5	16
φd	0.5	0.5	0.6	0.6	0.6	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5
φD'	φD+0.5max.					
L'	L+1.5max.					

◆PART NUMBERING SYSTEM

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

Supplement code
Size code
Capacitance tolerance code
Capacitance code (ex. 47μF:470, 100μF:101, 1,000μF:102)
Lead forming·taping code
Terminal code
Voltage code (ex. 6.3V:6R3, 35V:350)
Series code
Category

Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KZH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
6.3	220	5×11	0.24	0.80	330	EKZH6R3E□□221ME11D
	470	6.3×11	0.11	0.35	500	EKZH6R3E□□471MF11D
	820	8×11.5	0.062	0.19	900	EKZH6R3E□□821MHB5D
	1,200	8×15	0.048	0.15	1,210	EKZH6R3E□□122MH15D
	1,200	10×12.5	0.045	0.14	1,240	EKZH6R3E□□122MJC5S
	1,500	8×20	0.033	0.11	1,410	EKZH6R3E□□152MH20D
	1,800	10×16	0.032	0.10	1,650	EKZH6R3E□□182MJ16S
	2,200	10×20	0.020	0.060	1,960	EKZH6R3E□□222MJ20S
	2,700	10×25	0.018	0.054	2,250	EKZH6R3E□□272MJ25S
	3,900	12.5×20	0.017	0.043	2,480	EKZH6R3E□□392MK20S
	4,700	12.5×25	0.015	0.038	2,900	EKZH6R3E□□472MK25S
	5,600	12.5×30	0.013	0.033	3,450	EKZH6R3E□□562MK30S
	6,800	12.5×35	0.012	0.031	3,570	EKZH6R3E□□682MK35S
	6,800	16×20	0.015	0.038	3,250	EKZH6R3E□□682ML20S
	8,200	16×25	0.013	0.035	3,630	EKZH6R3E□□822ML25S
10	150	5×11	0.24	0.80	330	EKZH100E□□151ME11D
	330	6.3×11	0.11	0.35	500	EKZH100E□□331MF11D
	680	8×11.5	0.062	0.19	900	EKZH100E□□681MHB5D
	1,000	8×15	0.048	0.15	1,210	EKZH100E□□102MH15D
	1,000	10×12.5	0.045	0.14	1,240	EKZH100E□□102MJC5S
	1,500	8×20	0.033	0.11	1,410	EKZH100E□□152MH20D
	1,500	10×16	0.032	0.10	1,650	EKZH100E□□152MJ16S
	1,800	10×20	0.020	0.060	1,960	EKZH100E□□182MJ20S
	2,200	10×25	0.018	0.054	2,250	EKZH100E□□222MJ25S
	3,300	12.5×20	0.017	0.043	2,480	EKZH100E□□332MK20S
	3,900	12.5×25	0.015	0.038	2,900	EKZH100E□□392MK25S
	4,700	12.5×30	0.013	0.033	3,450	EKZH100E□□472MK30S
	4,700	16×20	0.015	0.038	3,250	EKZH100E□□472ML20S
	5,600	12.5×35	0.012	0.031	3,570	EKZH100E□□562MK35S
	6,800	16×25	0.013	0.035	3,630	EKZH100E□□682ML25S
16	100	5×11	0.24	0.80	330	EKZH160E□□101ME11D
	220	6.3×11	0.11	0.35	500	EKZH160E□□221MF11D
	470	8×11.5	0.062	0.19	900	EKZH160E□□471MHB5D
	680	8×15	0.048	0.15	1,210	EKZH160E□□681MH15D
	680	10×12.5	0.045	0.14	1,240	EKZH160E□□681MJC5S
	1,000	8×20	0.033	0.11	1,410	EKZH160E□□102MH20D
	1,000	10×16	0.032	0.10	1,650	EKZH160E□□102MJ16S
	1,500	10×20	0.020	0.06	1,960	EKZH160E□□152MJ20S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
16	1,800	10×25	0.018	0.054	2,250	EKZH160E□□182MJ25S
	2,200	12.5×20	0.017	0.043	2,480	EKZH160E□□222MK20S
	2,700	12.5×25	0.015	0.038	2,900	EKZH160E□□272MK25S
	3,300	12.5×30	0.013	0.033	3,450	EKZH160E□□332MK30S
	3,300	16×20	0.015	0.038	3,250	EKZH160E□□332ML20S
	3,900	12.5×35	0.012	0.031	3,570	EKZH160E□□392MK35S
	4,700	16×25	0.013	0.035	3,630	EKZH160E□□472ML25S
25	68	5×11	0.24	0.80	330	EKZH250E□□680ME11D
	150	6.3×11	0.11	0.35	500	EKZH250E□□151MF11D
	330	8×11.5	0.062	0.19	900	EKZH250E□□331MHB5D
	390	8×15	0.048	0.15	1,210	EKZH250E□□391MH15D
	470	10×12.5	0.045	0.14	1,240	EKZH250E□□471MJC5S
	560	8×20	0.033	0.11	1,410	EKZH250E□□561MH20D
	680	10×16	0.032	0.10	1,650	EKZH250E□□681MJ16S
	820	10×20	0.020	0.060	1,960	EKZH250E□□821MJ20S
	1,000	10×25	0.018	0.054	2,250	EKZH250E□□102MJ25S
	1,500	12.5×20	0.017	0.043	2,480	EKZH250E□□152MK20S
	1,800	12.5×25	0.015	0.038	2,900	EKZH250E□□182MK25S
	2,200	12.5×30	0.013	0.033	3,450	EKZH250E□□222MK30S
	2,200	16×20	0.015	0.038	3,250	EKZH250E□□222ML20S
	2,700	12.5×35	0.012	0.031	3,570	EKZH250E□□272MK35S
	3,300	16×25	0.013	0.035	3,630	EKZH250E□□332ML25S
35	47	5×11	0.24	0.80	330	EKZH350E□□470ME11D
	100	6.3×11	0.11	0.35	500	EKZH350E□□101MF11D
	220	8×11.5	0.062	0.19	900	EKZH350E□□221MHB5D
	270	8×15	0.048	0.15	1,210	EKZH350E□□271MH15D
	330	10×12.5	0.045	0.14	1,240	EKZH350E□□331MJC5S
	390	8×20	0.033	0.11	1,410	EKZH350E□□391MH20D
	470	10×16	0.032	0.10	1,650	EKZH350E□□471MJ16S
	560	10×20	0.020	0.060	1,960	EKZH350E□□561MJ20S
	680	10×25	0.018	0.054	2,250	EKZH350E□□681MJ25S
	1,000	12.5×20	0.017	0.043	2,480	EKZH350E□□102MK20S
	1,200	12.5×25	0.015	0.038	2,900	EKZH350E□□122MK25S
	1,500	12.5×30	0.013	0.033	3,450	EKZH350E□□152MK30S
	1,500	16×20	0.015	0.038	3,250	EKZH350E□□152ML20S
	1,800	12.5×35	0.012	0.031	3,570	EKZH350E□□182MK35S
	2,200	16×25	0.013	0.035	3,630	EKZH350E□□222ML25S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance(μF) \ Frequency (Hz)	120	1k	10k	100k
0.47 to 150	0.40	0.75	0.90	1.00
220 to 560	0.50	0.85	0.94	1.00
680 to 1,800	0.60	0.87	0.95	1.00
2,200 to 3,900	0.75	0.90	0.95	1.00
4,700 to 8,200	0.85	0.95	0.98	1.00

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.

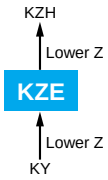
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KZE Series

- Ultra Low impedance for Personal Computer and Storage Equipment
- Endurance with ripple current: 1,000 to 5,000 hours at 105℃
- Non solvent-proof type
- **RoHS Compliant**

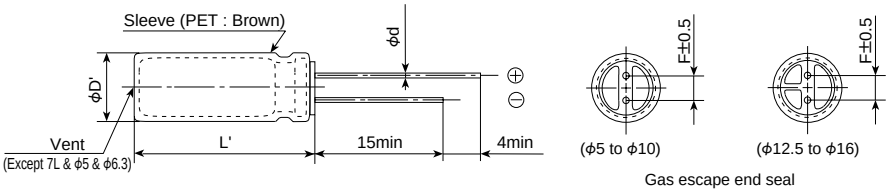


◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−40 to +105℃
Rated Voltage Range	6.3 to 100Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc): 6.3V / 10V / 16V / 25V / 35V / 50V / 63V / 80V / 100V tanδ (Max.): 0.22 / 0.19 / 0.16 / 0.14 / 0.12 / 0.10 / 0.09 / 0.09 / 0.08 When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Z (-25℃) / Z (+20℃): 2max. Z (-40℃) / Z (+20℃): 3max. (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 the specified period of time at 105℃. Time: 7L : 1,000hours φ5 & φ6.3 : 2,000hours φ8 : 3,000hours φ10 : 4,000hours φ12.5 to φ18 : 5,000hours Capacitance change: ≦±25% 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: ≦±25% of the initial value D.F. (tanδ): ≦200% of the initial specified value Leakage current: ≦The initial specified value

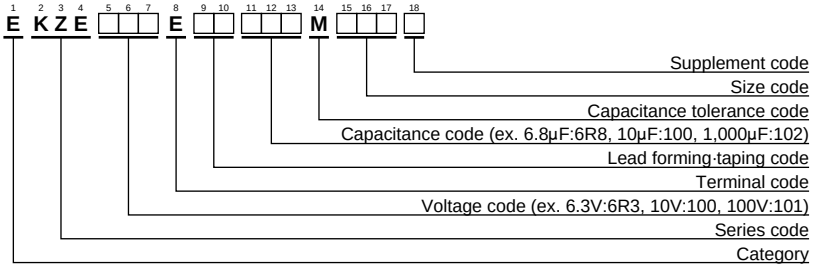
◆DIMENSIONS [mm]

- Terminal Code : E



φD		5	6.3	8	10, 12.5	16, 18
φd	7L	0.45	0.45	0.45	—	—
	11L～	0.5	0.5	0.6	0.6	0.8
F		2.0	2.5	3.5	5.0	7.5
φD'		φD+0.5max.				
L'		L+1.5max.(7L : L+1.0max.)				

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KZE Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
6.3	68	5×7	0.43	1.3	210	EKZE6R3E□□680ME07D
	150	6.3×7	0.23	0.69	300	EKZE6R3E□□151MF07D
	150	5×11	0.30	1.0	250	EKZE6R3E□□151ME11D
	220	8×7	0.15	0.45	380	EKZE6R3E□□221MH07D
	330	6.3×11	0.13	0.41	405	EKZE6R3E□□331MF11D
	560	8×11.5	0.072	0.22	760	EKZE6R3E□□561MHB5D
	820	8×15	0.056	0.17	995	EKZE6R3E□□821MH15D
	1,000	10×12.5	0.053	0.16	1,030	EKZE6R3E□□102MJC5S
	1,200	8×20	0.041	0.13	1,250	EKZE6R3E□□122MH20D
	1,200	10×16	0.038	0.12	1,430	EKZE6R3E□□122MJ16S
	1,500	10×20	0.023	0.069	1,820	EKZE6R3E□□152MJ20S
	2,200	10×25	0.022	0.066	2,150	EKZE6R3E□□222MJ25S
	3,300	12.5×20	0.021	0.053	2,360	EKZE6R3E□□332MK20S
	3,900	12.5×25	0.018	0.045	2,770	EKZE6R3E□□392MK25S
	4,700	12.5×30	0.016	0.041	3,290	EKZE6R3E□□472MK30S
	5,600	12.5×35	0.015	0.039	3,400	EKZE6R3E□□562MK35S
	5,600	16×20	0.018	0.045	3,140	EKZE6R3E□□562ML20S
	6,800	16×25	0.016	0.043	3,460	EKZE6R3E□□682ML25S
10	56	5×7	0.44	1.4	210	EKZE100E□□560ME07D
	100	5×11	0.30	1.0	250	EKZE100E□□101ME11D
	120	6.3×7	0.23	0.69	300	EKZE100E□□121MF07D
	180	8×7	0.15	0.45	380	EKZE100E□□181MH07D
	220	6.3×11	0.13	0.41	405	EKZE100E□□221MF11D
	470	8×11.5	0.072	0.22	760	EKZE100E□□471MHB5D
	680	8×15	0.056	0.17	995	EKZE100E□□681MH15D
	680	10×12.5	0.053	0.16	1,030	EKZE100E□□681MJC5S
	1,000	8×20	0.041	0.13	1,250	EKZE100E□□102MH20D
	1,000	10×16	0.038	0.12	1,430	EKZE100E□□102MJ16S
	1,200	10×20	0.023	0.069	1,820	EKZE100E□□122MJ20S
	1,500	10×25	0.022	0.066	2,150	EKZE100E□□152MJ25S
	2,200	12.5×20	0.021	0.053	2,360	EKZE100E□□222MK20S
	3,300	12.5×25	0.018	0.045	2,770	EKZE100E□□332MK25S
	3,900	12.5×30	0.016	0.041	3,290	EKZE100E□□392MK30S
	3,900	16×20	0.018	0.045	3,140	EKZE100E□□392ML20S
	4,700	12.5×35	0.015	0.039	3,400	EKZE100E□□472MK35S
	5,600	16×25	0.016	0.043	3,460	EKZE100E□□562ML25S
16	33	5×7	0.45	1.4	210	EKZE160E□□330ME07D
	56	5×11	0.30	1.0	250	EKZE160E□□560ME11D
	68	6.3×7	0.24	0.72	300	EKZE160E□□680MF07D
	120	8×7	0.15	0.45	380	EKZE160E□□121MH07D
	120	6.3×11	0.13	0.41	405	EKZE160E□□121MF11D
	330	8×11.5	0.072	0.22	760	EKZE160E□□331MHB5D
	470	8×15	0.056	0.17	995	EKZE160E□□471MH15D
	470	10×12.5	0.053	0.16	1,030	EKZE160E□□471MJC5S
	680	8×20	0.041	0.13	1,250	EKZE160E□□681MH20D
	680	10×16	0.038	0.12	1,430	EKZE160E□□681MJ16S
	1,000	10×20	0.023	0.069	1,820	EKZE160E□□102MJ20S
	1,200	10×25	0.022	0.066	2,150	EKZE160E□□122MJ25S
	1,500	12.5×20	0.021	0.053	2,360	EKZE160E□□152MK20S
	2,200	12.5×25	0.018	0.045	2,770	EKZE160E□□222MK25S
	2,700	12.5×30	0.016	0.041	3,290	EKZE160E□□272MK30S
	2,700	16×20	0.018	0.045	3,140	EKZE160E□□272ML20S
	3,300	12.5×35	0.015	0.039	3,400	EKZE160E□□332MK35S
	3,900	16×25	0.016	0.043	3,460	EKZE160E□□392ML25S
25	27	5×7	0.46	1.4	210	EKZE250E□□270ME07D
	47	5×11	0.30	1.0	250	EKZE250E□□470ME11D
	56	6.3×7	0.24	0.72	300	EKZE250E□□560MF07D
	100	8×7	0.15	0.45	380	EKZE250E□□101MH07D
	100	6.3×11	0.13	0.41	405	EKZE250E□□101MF11D
	220	8×11.5	0.072	0.22	760	EKZE250E□□221MHB5D
	330	8×15	0.056	0.17	995	EKZE250E□□331MH15D
	330	10×12.5	0.053	0.16	1,030	EKZE250E□□331MJC5S
	470	8×20	0.041	0.13	1,250	EKZE250E□□471MH20D
	470	10×16	0.038	0.12	1,430	EKZE250E□□471MJ16S
	680	10×20	0.023	0.069	1,820	EKZE250E□□681MJ20S
25	820	10×25	0.022	0.066	2,150	EKZE250E□□821MJ25S
	1,000	12.5×20	0.021	0.053	2,360	EKZE250E□□102MK20S
	1,500	12.5×25	0.018	0.045	2,770	EKZE250E□□152MK25S
	1,800	12.5×30	0.016	0.041	3,290	EKZE250E□□182MK30S
	1,800	16×20	0.018	0.045	3,140	EKZE250E□□182ML20S
	2,200	12.5×35	0.015	0.039	3,400	EKZE250E□□222MK35S
	2,700	16×25	0.016	0.043	3,460	EKZE250E□□272ML25S
35	18	5×7	0.47	1.5	210	EKZE350E□□180ME07D
	33	5×11	0.30	1.0	250	EKZE350E□□330ME11D
	39	6.3×7	0.25	0.75	300	EKZE350E□□390MF07D
	56	8×7	0.16	0.48	380	EKZE350E□□560MH07D
	56	6.3×11	0.13	0.41	405	EKZE350E□□560MF11D
	150	8×11.5	0.072	0.22	760	EKZE350E□□151MHB5D
	220	8×15	0.056	0.17	995	EKZE350E□□221MH15D
	220	10×12.5	0.053	0.16	1,030	EKZE350E□□221MJC5S
	270	8×20	0.041	0.13	1,250	EKZE350E□□271MH20D
	330	10×16	0.038	0.12	1,430	EKZE350E□□331MJ16S
	470	10×20	0.023	0.069	1,820	EKZE350E□□471MJ20S
	560	10×25	0.022	0.066	2,150	EKZE350E□□561MJ25S
	680	12.5×20	0.021	0.053	2,360	EKZE350E□□681MK20S
	1,000	12.5×25	0.018	0.045	2,770	EKZE350E□□102MK25S
	1,200	12.5×30	0.016	0.041	3,290	EKZE350E□□122MK30S
	1,200	16×20	0.018	0.045	3,140	EKZE350E□□122ML20S
	1,500	12.5×35	0.015	0.039	3,400	EKZE350E□□152MK35S
	1,800	16×25	0.016	0.043	3,460	EKZE350E□□182ML25S
50	10	5×7	0.50	1.5	210	EKZE500E□□100ME07D
	22	6.3×7	0.26	0.78	300	EKZE500E□□220MF07D
	22	5×11	0.34	1.18	238	EKZE500E□□220ME11D
	33	8×7	0.17	0.51	380	EKZE500E□□330MH07D
	56	6.3×11	0.14	0.50	385	EKZE500E□□560MF11D
	100	8×11.5	0.074	0.22	724	EKZE500E□□101MHB5D
	120	8×15	0.061	0.18	950	EKZE500E□□121MH15D
	150	10×12.5	0.061	0.18	979	EKZE500E□□151MJC5S
	180	8×20	0.046	0.14	1,190	EKZE500E□□181MH20D
	220	10×16	0.042	0.12	1,370	EKZE500E□□221MJ16S
	270	10×20	0.030	0.090	1,580	EKZE500E□□271MJ20S
	330	10×25	0.028	0.085	1,870	EKZE500E□□331MJ25S
	470	12.5×20	0.027	0.068	2,050	EKZE500E□□471MK20S
	560	12.5×25	0.023	0.059	2,410	EKZE500E□□561MK25S
	680	12.5×30	0.021	0.052	2,860	EKZE500E□□681MK30S
	820	12.5×35	0.019	0.051	2,960	EKZE500E□□821MK35S
	820	16×20	0.023	0.059	2,730	EKZE500E□□821ML20S
	1,000	16×25	0.021	0.056	3,010	EKZE500E□□102ML25S
63	15	5×11	0.88	3.5	165	EKZE630E□□150ME11D
	33	6.3×11	0.35	1.4	265	EKZE630E□□330MF11D
	56	8×11.5	0.22	0.88	500	EKZE630E□□560MHB5D
	82	8×15	0.16	0.64	665	EKZE630E□□820MH15D
	82	10×12.5	0.11	0.44	690	EKZE630E□□820MJC5S
	120	8×20	0.12	0.48	820	EKZE630E□□121MH20D
	120	10×16	0.076	0.31	950	EKZE630E□□121MJ16S
	180	10×20	0.056	0.23	1,150	EKZE630E□□181MJ20S
	180	12.5×16	0.072	0.29	1,150	EKZE630E□□181MK16S
	220	10×25	0.046	0.19	1,350	EKZE630E□□221MJ25S
	270	12.5×20	0.041	0.13	1,500	EKZE630E□□271MK20S
	390	12.5×25	0.031	0.093	1,900	EKZE630E□□391MK25S
	470	12.5×30	0.028	0.084	2,300	EKZE630E□□471MK30S
	470	16×20	0.032	0.096	2,000	EKZE630E□□471ML20S
	560	12.5×35	0.024	0.072	2,500	EKZE630E□□561MK35S
	680	12.5×40	0.021	0.063	2,800	EKZE630E□□681MK40S
	680	16×25	0.025	0.075	2,600	EKZE630E□□681ML25S
	680	18×20	0.030	0.090	2,500	EKZE630E□□681MM20S
	820	16×31.5	0.021	0.063	2,850	EKZE630E□□821MLN3S
	820	18×25	0.024	0.072	2,800	EKZE630E□□821MM25S
	1,000	16×35.5	0.019	0.057	2,900	EKZE630E□□102MLP1S
	1,200	16×40	0.018	0.054	3,400	EKZE630E□□122ML40S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KZE Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
63	1,200	18×31.5	0.020	0.060	3,300	EKZE630E□□122MMN3S
	1,500	18×35.5	0.018	0.054	3,400	EKZE630E□□152MMP1S
	1,800	18×40	0.017	0.051	3,500	EKZE630E□□182MM40S
80	68	10×12.5	0.17	0.66	480	EKZE800E□□680MJC5S
	100	10×16	0.11	0.47	600	EKZE800E□□101MJ16S
	120	10×20	0.084	0.34	800	EKZE800E□□121MJ20S
	150	10×25	0.069	0.28	900	EKZE800E□□151MJ25S
	150	12.5×16	0.11	0.34	750	EKZE800E□□151MK16S
	220	12.5×20	0.062	0.18	1,100	EKZE800E□□221MK20S
	330	12.5×25	0.047	0.14	1,250	EKZE800E□□331MK25S
	330	16×20	0.048	0.15	1,350	EKZE800E□□331ML20S
	390	12.5×30	0.042	0.13	1,500	EKZE800E□□391MK30S
	470	12.5×35	0.036	0.11	1,650	EKZE800E□□471MK35S
	470	16×25	0.038	0.12	1,700	EKZE800E□□471ML25S
	470	18×20	0.045	0.14	1,500	EKZE800E□□471MM20S
	560	12.5×40	0.032	0.095	1,800	EKZE800E□□561MK40S
	680	16×31.5	0.032	0.095	1,850	EKZE800E□□681MLN3S
	680	18×25	0.036	0.11	1,750	EKZE800E□□681MM25S
	820	16×35.5	0.029	0.086	2,000	EKZE800E□□821MLP1S
	820	18× 31.5	0.030	0.090	1,900	EKZE800E□□821MMN3S
	1,000	16×40	0.027	0.081	2,200	EKZE800E□□102ML40S
	1,000	18× 35.5	0.027	0.081	2,200	EKZE800E□□102MMP1S
	1,200	18× 40	0.026	0.077	2,700	EKZE800E□□122MM40S

□□ : Fill with appropriate lead forming or taping code.

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
100	6.8	5× 11	1.4	5.6	125	EKZE101E□□6R8ME11D
	15	6.3× 11	0.57	2.3	205	EKZE101E□□150MF11D
	27	8× 11.5	0.36	1.4	355	EKZE101E□□270MHB5D
	39	8× 15	0.25	1.0	450	EKZE101E□□390MH15D
	47	10× 12.5	0.17	0.66	480	EKZE101E□□470MJC5S
	56	8× 20	0.19	0.76	565	EKZE101E□□560MH20D
	68	10× 16	0.11	0.47	600	EKZE101E□□680MJ16S
	82	10× 20	0.084	0.34	800	EKZE101E□□820MJ20S
	100	12.5× 16	0.11	0.34	750	EKZE101E□□101MK16S
	120	10× 25	0.069	0.28	900	EKZE101E□□121MJ25S
	150	12.5× 20	0.062	0.18	1,100	EKZE101E□□151MK20S
	220	12.5× 25	0.047	0.14	1,250	EKZE101E□□221MK25S
	220	16× 20	0.048	0.15	1,350	EKZE101E□□221ML20S
	270	12.5× 30	0.042	0.13	1,500	EKZE101E□□271MK30S
	330	12.5× 35	0.036	0.11	1,650	EKZE101E□□331MK35S
	330	16× 25	0.038	0.12	1,700	EKZE101E□□331ML25S
	330	18× 20	0.045	0.14	1,500	EKZE101E□□331MM20S
	390	12.5× 40	0.032	0.095	1,800	EKZE101E□□391MK40S
	470	16× 31.5	0.032	0.095	1,850	EKZE101E□□471MLN3S
	470	18× 25	0.036	0.11	1,750	EKZE101E□□471MM25S
	560	16× 35.5	0.029	0.086	2,000	EKZE101E□□561MLP1S
	560	18× 31.5	0.030	0.090	1,900	EKZE101E□□561MMN3S
	680	16× 40	0.027	0.081	2,200	EKZE101E□□681ML40S
	680	18× 35.5	0.027	0.081	2,200	EKZE101E□□681MMP1S
	820	18× 40	0.026	0.077	2,700	EKZE101E□□821MM40S

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

7L

Capacitance(μF) \ Frequency (Hz)	120	1k	10k	100k
10 to 33	0.42	0.70	0.90	1.00
39 to 220	0.50	0.73	0.92	1.00

11L to 40L

Capacitance(μF) \ Frequency (Hz)	120	1k	10k	100k
6.8 to 180	0.40	0.75	0.90	1.00
220 to 560	0.50	0.85	0.94	1.00
680 to 1,800	0.60	0.87	0.95	1.00
2,200 to 3,900	0.75	0.90	0.95	1.00
4,700 to	0.85	0.95	0.98	1.00

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.

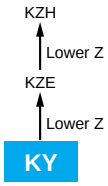
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KY Series

- Newly innovative electrolyte is employed to minimize ESR
- Endurance with ripple current : 4,000 to 10,000 hours at 105℃
- Non solvent-proof type
- 63 to 100Vdc newly added
- **RoHS Compliant**

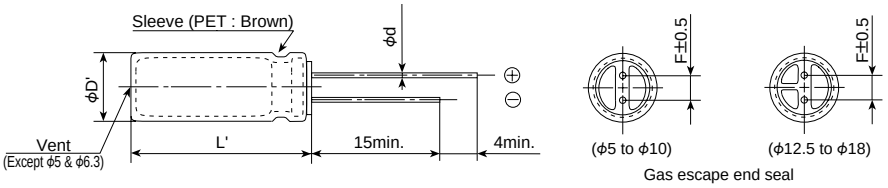


◆SPECIFICATIONS

Items	Characteristics									
Category Temperature Range	−40 to +105℃									
Rated Voltage Range	6.3 to 100Vdc									
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)									
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)									
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	80V	100V
	tanδ (Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.09	0.08
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)									
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	80V	100V
	Z(−25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	2
	Z(−40℃)/Z(+20℃)	8	6	4	3	3	3	3	3	3
	(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 the specified period of time at 105℃.									
	Time: 6.3 to 10Vdc	φ5 & 6.3 : 4,000hours φ8 & 10 : 6,000hours φ12.5 to 18 : 8,000hours								
	Time: 16 to 100Vdc	φ5 & 6.3 : 5,000hours φ8 & 10 : 7,000hours φ12.5 to 18 : 10,000hours								
	Capacitance change	≦±25% 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	≦±25% of the initial value								
	D.F. (tanδ)	≦200% of the initial specified value								
	Leakage current	≦The initial specified value								

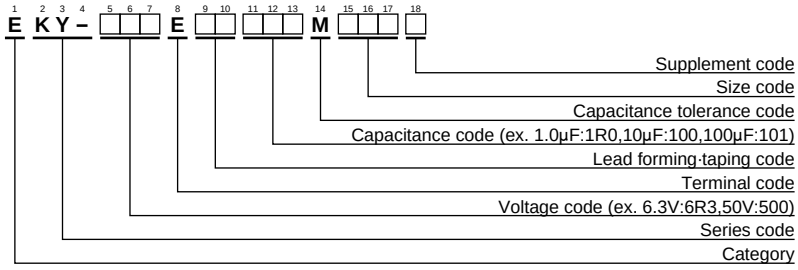
◆DIMENSIONS [mm]

- Terminal Code : E



φD	5	6.3	8	10	12.5	16	18
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φD'	φD+0.5max.						
L'	L+1.5max.						

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KY Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
6.3	150	5×11	0.58	2.3	210	EKY-6R3E□□151ME11D
	330	6.3×11	0.22	0.87	340	EKY-6R3E□□331MF11D
	680	8×11.5	0.13	0.52	640	EKY-6R3E□□681MHB5D
	820	10×12.5	0.080	0.32	865	EKY-6R3E□□821MJC5S
	1,000	8×15	0.087	0.35	840	EKY-6R3E□□102MH15D
	1,200	8×20	0.069	0.27	1,050	EKY-6R3E□□122MH20D
	1,200	10×16	0.060	0.24	1,210	EKY-6R3E□□122MJ16S
	1,500	10×20	0.046	0.18	1,400	EKY-6R3E□□152MJ20S
	1,800	12.5×15	0.049	0.16	1,450	EKY-6R3E□□182MK15S
	2,200	10×25	0.042	0.17	1,650	EKY-6R3E□□222MJ25S
	2,700	10×30	0.031	0.12	1,910	EKY-6R3E□□272MJ30S
	2,700	16×15	0.042	0.12	1,940	EKY-6R3E□□272ML15S
	3,300	12.5×20	0.035	0.12	1,900	EKY-6R3E□□332MK20S
	3,900	12.5×25	0.027	0.089	2,230	EKY-6R3E□□392MK25S
	3,900	18×15	0.043	0.11	2,210	EKY-6R3E□□392MM15S
	4,700	12.5×30	0.024	0.078	2,650	EKY-6R3E□□472MK30S
	5,600	12.5×35	0.020	0.065	2,880	EKY-6R3E□□562MK35S
	5,600	16×20	0.027	0.078	2,530	EKY-6R3E□□562ML20S
	6,800	12.5×40	0.017	0.056	3,350	EKY-6R3E□□682MK40S
	6,800	16×25	0.021	0.060	2,930	EKY-6R3E□□682ML25S
	6,800	18×20	0.026	0.067	2,860	EKY-6R3E□□682MM20S
	8,200	16×31.5	0.017	0.050	3,450	EKY-6R3E□□822MLN3S
	10,000	16×35.5	0.015	0.044	3,610	EKY-6R3E□□103MLP1S
	10,000	18×25	0.019	0.049	3,140	EKY-6R3E□□103MM25S
	12,000	16×40	0.013	0.038	4,080	EKY-6R3E□□123ML40S
	12,000	18×31.5	0.015	0.040	4,170	EKY-6R3E□□123MMN3S
	15,000	18×35.5	0.014	0.038	4,220	EKY-6R3E□□153MMP1S
	18,000	18×40	0.012	0.032	4,280	EKY-6R3E□□183MM40S
10	100	5×11	0.58	2.3	210	EKY-100E□□101ME11D
	220	6.3×11	0.22	0.87	340	EKY-100E□□221MF11D
	470	8×11.5	0.13	0.52	640	EKY-100E□□471MHB5D
	680	8×15	0.087	0.35	840	EKY-100E□□681MH15D
	680	10×12.5	0.080	0.32	865	EKY-100E□□681MJC5S
	1,000	8×20	0.069	0.27	1,050	EKY-100E□□102MH20D
	1,000	10×16	0.060	0.24	1,210	EKY-100E□□102MJ16S
	1,200	10×20	0.046	0.18	1,400	EKY-100E□□122MJ20S
	1,500	10×25	0.042	0.17	1,650	EKY-100E□□152MJ25S
	1,500	12.5×15	0.049	0.16	1,450	EKY-100E□□152MK15S
	2,200	10×30	0.031	0.12	1,910	EKY-100E□□222MJ30S
	2,200	12.5×20	0.035	0.12	1,900	EKY-100E□□222MK20S
	2,200	16×15	0.042	0.12	1,940	EKY-100E□□222ML15S
	2,700	18×15	0.043	0.11	2,210	EKY-100E□□272MM15S
	3,300	12.5×25	0.027	0.089	2,230	EKY-100E□□332MK25S
	3,900	12.5×30	0.024	0.078	2,650	EKY-100E□□392MK30S
	3,900	16×20	0.027	0.078	2,530	EKY-100E□□392ML20S
	4,700	12.5×35	0.020	0.065	2,880	EKY-100E□□472MK35S
	5,600	12.5×40	0.017	0.056	3,350	EKY-100E□□562MK40S
	5,600	16×25	0.021	0.060	2,930	EKY-100E□□562ML25S
	5,600	18×20	0.026	0.067	2,860	EKY-100E□□562MM20S
	6,800	16×31.5	0.017	0.050	3,450	EKY-100E□□682MLN3S
	6,800	18×25	0.019	0.049	3,140	EKY-100E□□682MM25S
	8,200	16×35.5	0.015	0.044	3,610	EKY-100E□□822MLP1S
	8,200	18×31.5	0.015	0.040	4,170	EKY-100E□□822MMN3S
	10,000	16×40	0.013	0.038	4,080	EKY-100E□□103ML40S
	10,000	18×35.5	0.014	0.038	4,220	EKY-100E□□103MMP1S
	12,000	18×40	0.012	0.032	4,280	EKY-100E□□123MM40S
16	56	5×11	0.58	2.3	210	EKY-160E□□560ME11D
	120	6.3×11	0.22	0.87	340	EKY-160E□□121MF11D
	330	8×11.5	0.13	0.52	640	EKY-160E□□331MHB5D
	470	8×15	0.087	0.35	840	EKY-160E□□471MH15D
	470	10×12.5	0.080	0.32	865	EKY-160E□□471MJC5S
	680	8×20	0.069	0.27	1,050	EKY-160E□□681MH20D
	680	10×16	0.060	0.24	1,210	EKY-160E□□681MJ16S
	1,000	10×20	0.046	0.18	1,400	EKY-160E□□102MJ20S
	1,000	12.5×15	0.049	0.16	1,450	EKY-160E□□102MK15S
	1,200	10×25	0.042	0.17	1,650	EKY-160E□□122MJ25S
	1,500	10×30	0.031	0.12	1,910	EKY-160E□□152MJ30S
16	1,500	12.5×20	0.035	0.12	1,900	EKY-160E□□152MK20S
	1,500	16×15	0.042	0.12	1,940	EKY-160E□□152ML15S
	2,200	12.5×25	0.027	0.089	2,230	EKY-160E□□222MK25S
	2,200	18×15	0.043	0.11	2,210	EKY-160E□□222MM15S
	2,700	12.5×30	0.024	0.078	2,650	EKY-160E□□272MK30S
	2,700	16×20	0.027	0.078	2,530	EKY-160E□□272ML20S
	3,300	12.5×35	0.020	0.065	2,880	EKY-160E□□332MK35S
	3,900	12.5×40	0.017	0.056	3,350	EKY-160E□□392MK40S
	3,900	16×25	0.021	0.060	2,930	EKY-160E□□392ML25S
	3,900	18×20	0.026	0.067	2,860	EKY-160E□□392MM20S
	4,700	16×31.5	0.017	0.050	3,450	EKY-160E□□472MLN3S
	4,700	18×25	0.019	0.049	3,140	EKY-160E□□472MM25S
	5,600	16×35.5	0.015	0.044	3,610	EKY-160E□□562MLP1S
	5,600	18×31.5	0.015	0.040	4,170	EKY-160E□□562MMN3S
	6,800	16×40	0.013	0.038	4,080	EKY-160E□□682ML40S
	8,200	18×35.5	0.014	0.038	4,220	EKY-160E□□822MMP1S
	10,000	18×40	0.012	0.032	4,280	EKY-160E□□103MM40S
25	47	5×11	0.58	2.3	210	EKY-250E□□470ME11D
	100	6.3×11	0.22	0.87	340	EKY-250E□□101MF11D
	220	8×11.5	0.13	0.52	640	EKY-250E□□221MHB5D
	330	8×15	0.087	0.35	840	EKY-250E□□331MH15D
	330	10×12.5	0.080	0.32	865	EKY-250E□□331MJC5S
	470	8×20	0.069	0.27	1,050	EKY-250E□□471MH20D
	470	10×16	0.060	0.24	1,210	EKY-250E□□471MJ16S
	680	10×20	0.046	0.18	1,400	EKY-250E□□681MJ20S
	680	12.5×15	0.049	0.16	1,450	EKY-250E□□681MK15S
	820	10×25	0.042	0.17	1,650	EKY-250E□□821MJ25S
	1,000	10×30	0.031	0.12	1,910	EKY-250E□□102MJ30S
	1,000	12.5×20	0.035	0.12	1,900	EKY-250E□□102MK20S
	1,000	16×15	0.042	0.12	1,940	EKY-250E□□102ML15S
	1,200	18×15	0.043	0.11	2,210	EKY-250E□□122MM15S
	1,500	12.5×25	0.027	0.089	2,230	EKY-250E□□152MK25S
	1,800	12.5×30	0.024	0.078	2,650	EKY-250E□□182MK30S
	1,800	16×20	0.027	0.078	2,530	EKY-250E□□182ML20S
	2,200	12.5×35	0.020	0.065	2,880	EKY-250E□□222MK35S
	2,200	18×20	0.026	0.067	2,860	EKY-250E□□222MM20S
	2,700	12.5×40	0.017	0.056	3,350	EKY-250E□□272MK40S
	2,700	16×25	0.021	0.060	2,930	EKY-250E□□272ML25S
	3,300	16×31.5	0.017	0.050	3,450	EKY-250E□□332MLN3S
	3,300	18×25	0.019	0.049	3,140	EKY-250E□□332MM25S
	3,900	16×35.5	0.015	0.044	3,610	EKY-250E□□392MLP1S
	3,900	18×31.5	0.015	0.040	4,170	EKY-250E□□392MMN3S
	4,700	16×40	0.013	0.038	4,080	EKY-250E□□472ML40S
	4,700	18×35.5	0.014	0.038	4,220	EKY-250E□□472MMP1S
	5,600	18×40	0.012	0.032	4,280	EKY-250E□□562MM40S
35	33	5×11	0.58	2.3	210	EKY-350E□□330ME11D
	56	6.3×11	0.22	0.87	340	EKY-350E□□560MF11D
	150	8×11.5	0.13	0.52	640	EKY-350E□□151MHB5D
	220	8×15	0.087	0.35	840	EKY-350E□□221MH15D
	220	10×12.5	0.080	0.32	865	EKY-350E□□221MJC5S
	270	8×20	0.069	0.27	1,050	EKY-350E□□271MH20D
	330	10×16	0.060	0.24	1,210	EKY-350E□□331MJ16S
	470	10×20	0.046	0.18	1,400	EKY-350E□□471MJ20S
	470	12.5×15	0.049	0.16	1,450	EKY-350E□□471MK15S
	560	10×25	0.042	0.17	1,650	EKY-350E□□561MJ25S
	680	10×30	0.031	0.12	1,910	EKY-350E□□681MJ30S
	680	12.5×20	0.035	0.12	1,900	EKY-350E□□681MK20S
	680	16×15	0.042	0.12	1,940	EKY-350E□□681ML15S
	1,000	12.5×25	0.027	0.089	2,230	EKY-350E□□102MK25S
	1,000	18×15	0.043	0.11	2,210	EKY-350E□□102MM15S
	1,200	12.5×30	0.024	0.078	2,650	EKY-350E□□122MK30S
	1,200	16×20	0.027	0.078	2,530	EKY-350E□□122ML20S
	1,500	12.5×35	0.020	0.065	2,880	EKY-350E□□152MK35S
	1,800	12.5×40	0.017	0.056	3,350	EKY-350E□□182MK40S
	1,800	16×25	0.021	0.060	2,930	EKY-350E□□182ML25S
	1,800	18×20	0.026	0.067	2,860	EKY-350E□□182MM20S
	2,200	16×31.5	0.017	0.050	3,450	EKY-350E□□222MLN3S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

KY Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
35	2,200	18×25	0.019	0.049	3,140	EKY-350E□□222MM25S
	2,700	16×35.5	0.015	0.044	3,610	EKY-350E□□272MLP1S
	2,700	18×31.5	0.015	0.040	4,170	EKY-350E□□272MMN3S
	3,300	16×40	0.013	0.038	4,080	EKY-350E□□332ML40S
	3,300	18×35.5	0.014	0.038	4,220	EKY-350E□□332MMP1S
	3,900	18×40	0.012	0.032	4,280	EKY-350E□□392MM40S
50	0.47	5×11	5.5	22.0	17	EKY-500E□□R47ME11D
	1.0	5×11	4.0	16.0	30	EKY-500E□□1R0ME11D
	2.2	5×11	2.5	10.0	43	EKY-500E□□2R2ME11D
	3.3	5×11	2.2	8.8	53	EKY-500E□□3R3ME11D
	4.7	5×11	1.9	7.6	88	EKY-500E□□4R7ME11D
	10	5×11	1.5	6.0	100	EKY-500E□□100ME11D
	22	5×11	0.70	2.8	180	EKY-500E□□220ME11D
	56	6.3×11	0.30	1.2	295	EKY-500E□□560MF11D
	100	8×11.5	0.17	0.68	555	EKY-500E□□101MHB5D
	120	8×15	0.12	0.48	730	EKY-500E□□121MH15D
	150	10×12.5	0.12	0.48	760	EKY-500E□□151MJC5S
	180	8×20	0.091	0.36	910	EKY-500E□□181MH20D
	220	10×16	0.084	0.34	1,050	EKY-500E□□221MJ16S
	270	10×20	0.060	0.24	1,220	EKY-500E□□271MJ20S
	270	12.5×15	0.061	0.20	1,260	EKY-500E□□271MK15S
	330	10×25	0.055	0.22	1,440	EKY-500E□□331MJ25S
	470	10×30	0.043	0.17	1,690	EKY-500E□□471MJ30S
	470	12.5×20	0.045	0.15	1,660	EKY-500E□□471MK20S
	470	16×15	0.055	0.17	1,690	EKY-500E□□471ML15S
	560	12.5×25	0.034	0.11	1,950	EKY-500E□□561MK25S
	560	18×15	0.054	0.15	1,930	EKY-500E□□561MM15S
	680	12.5×30	0.030	0.10	2,310	EKY-500E□□681MK30S
	820	12.5×35	0.025	0.083	2,510	EKY-500E□□821MK35S
	820	16×20	0.034	0.10	2,210	EKY-500E□□821ML20S
	1,000	12.5×40	0.021	0.069	2,920	EKY-500E□□102MK40S
	1,000	16×25	0.025	0.075	2,555	EKY-500E□□102ML25S
	1,000	18×20	0.036	0.097	2,490	EKY-500E□□102MM20S
	1,200	16×31.5	0.022	0.066	3,010	EKY-500E□□122MLN3S
	1,200	18×25	0.026	0.070	2,740	EKY-500E□□122MM25S
	1,500	16×35.5	0.019	0.057	3,150	EKY-500E□□152MLP1S
	1,800	16×40	0.016	0.048	3,710	EKY-500E□□182ML40S
	1,800	18×31.5	0.021	0.057	3,635	EKY-500E□□182MMN3S
	2,200	18×35.5	0.017	0.046	3,680	EKY-500E□□222MMP1S
	2,700	18×40	0.014	0.038	3,800	EKY-500E□□272MM40S
63	15	5×11	0.88	3.5	165	EKY-630E□□150ME11D
	33	6.3×11	0.35	1.4	265	EKY-630E□□330MF11D
	56	8×11.5	0.22	0.88	500	EKY-630E□□560MHB5D
	82	8×15	0.16	0.64	665	EKY-630E□□820MH15D
	82	10×12.5	0.11	0.44	690	EKY-630E□□820MJC5S
	120	8×20	0.12	0.48	820	EKY-630E□□121MH20D
	120	10×16	0.076	0.31	950	EKY-630E□□121MJ16S
	180	10×20	0.056	0.23	1,150	EKY-630E□□181MJ20S
	180	12.5×16	0.072	0.29	1,150	EKY-630E□□181MK16S
	220	10×25	0.046	0.19	1,350	EKY-630E□□221MJ25S
	270	12.5×20	0.041	0.13	1,500	EKY-630E□□271MK20S
	390	12.5×25	0.031	0.093	1,900	EKY-630E□□391MK25S
	470	12.5×30	0.028	0.084	2,300	EKY-630E□□471MK30S
	470	16×20	0.032	0.096	2,000	EKY-630E□□471ML20S
	560	12.5×35	0.024	0.072	2,500	EKY-630E□□561MK35S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
63	680	12.5×40	0.021	0.063	2,800	EKY-630E□□681MK40S
	680	16×25	0.025	0.075	2,600	EKY-630E□□681ML25S
	680	18×20	0.030	0.090	2,500	EKY-630E□□681MM20S
	820	16×31.5	0.021	0.063	2,850	EKY-630E□□821MLN3S
	820	18×25	0.024	0.072	2,800	EKY-630E□□821MM25S
	1,000	16×35.5	0.019	0.057	2,900	EKY-630E□□102MLP1S
	1,200	16×40	0.018	0.054	3,400	EKY-630E□□122ML40S
	1,200	18×31.5	0.020	0.060	3,300	EKY-630E□□122MMN3S
	1,500	18×35.5	0.018	0.054	3,400	EKY-630E□□152MMP1S
	1,800	18×40	0.017	0.051	3,500	EKY-630E□□182MM40S
80	68	10×12.5	0.17	0.66	480	EKY-800E□□680MJC5S
	100	10×16	0.11	0.47	600	EKY-800E□□101MJ16S
	120	10×20	0.084	0.34	800	EKY-800E□□121MJ20S
	150	10×25	0.069	0.28	900	EKY-800E□□151MJ25S
	150	12.5×16	0.11	0.34	750	EKY-800E□□151MK16S
	220	12.5×20	0.062	0.18	1,100	EKY-800E□□221MK20S
	330	12.5×25	0.047	0.14	1,250	EKY-800E□□331MK25S
	330	16×20	0.048	0.15	1,350	EKY-800E□□331ML20S
	390	12.5×30	0.042	0.13	1,500	EKY-800E□□391MK30S
	470	12.5×35	0.036	0.11	1,650	EKY-800E□□471MK35S
	470	16×25	0.038	0.12	1,700	EKY-800E□□471ML25S
	470	18×20	0.045	0.14	1,500	EKY-800E□□471MM20S
	560	12.5×40	0.032	0.095	1,800	EKY-800E□□561MK40S
	680	16×31.5	0.032	0.095	1,850	EKY-800E□□681MLN3S
	680	18×25	0.036	0.11	1,750	EKY-800E□□681MM25S
	820	16×35.5	0.029	0.086	2,000	EKY-800E□□821MLP1S
	820	18× 31.5	0.030	0.090	1,900	EKY-800E□□821MMN3S
	1,000	16×40	0.027	0.081	2,200	EKY-800E□□102ML40S
	1,000	18× 35.5	0.027	0.081	2,200	EKY-800E□□102MMP1S
	1,200	18× 40	0.026	0.077	2,700	EKY-800E□□122MM40S
100	6.8	5× 11	1.4	5.6	125	EKY-101E□□6R8ME11D
	15	6.3× 11	0.57	2.3	205	EKY-101E□□150MF11D
	27	8× 11.5	0.36	1.4	355	EKY-101E□□270MHB5D
	39	8× 15	0.25	1.0	450	EKY-101E□□390MH15D
	47	10× 12.5	0.17	0.66	480	EKY-101E□□470MJC5S
	56	8× 20	0.19	0.76	565	EKY-101E□□560MH20D
	68	10× 16	0.11	0.47	600	EKY-101E□□680MJ16S
	82	10× 20	0.084	0.34	800	EKY-101E□□820MJ20S
	100	12.5× 16	0.11	0.34	750	EKY-101E□□101MK16S
	120	10× 25	0.069	0.28	900	EKY-101E□□121MJ25S
	150	12.5× 20	0.062	0.18	1,100	EKY-101E□□151MK20S
	220	12.5× 25	0.047	0.14	1,250	EKY-101E□□221MK25S
	220	16× 20	0.048	0.15	1,350	EKY-101E□□221ML20S
	270	12.5× 30	0.042	0.13	1,500	EKY-101E□□271MK30S
	330	12.5× 35	0.036	0.11	1,650	EKY-101E□□331MK35S
	330	16× 25	0.038	0.12	1,700	EKY-101E□□331ML25S
	330	18× 20	0.045	0.14	1,500	EKY-101E□□331MM20S
	390	12.5× 40	0.032	0.095	1,800	EKY-101E□□391MK40S
	470	16× 31.5	0.032	0.095	1,850	EKY-101E□□471MLN3S
	470	18× 25	0.036	0.11	1,750	EKY-101E□□471MM25S
	560	16× 35.5	0.029	0.086	2,000	EKY-101E□□561MLP1S
	560	18× 31.5	0.030	0.090	1,900	EKY-101E□□561MMN3S
	680	16× 40	0.027	0.081	2,200	EKY-101E□□681ML40S
	680	18× 35.5	0.027	0.081	2,200	EKY-101E□□681MMP1S
	820	18× 40	0.026	0.077	2,700	EKY-101E□□821MM40S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
0.47 to 180	0.40	0.75	0.90	1.00
220 to 560	0.50	0.85	0.94	1.00
680 to 1,800	0.60	0.87	0.95	1.00
2,200 to 3,900	0.75	0.90	0.95	1.00
4,700 to	0.85	0.95	0.98	1.00

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, Downsized, 105℃

LXZ Series

- Newly innovative electrolyte and internal architecture are employed
- Very low impedance at high frequency range
- Endurance with ripple current: 2,000 to 8,000 hours at 105℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

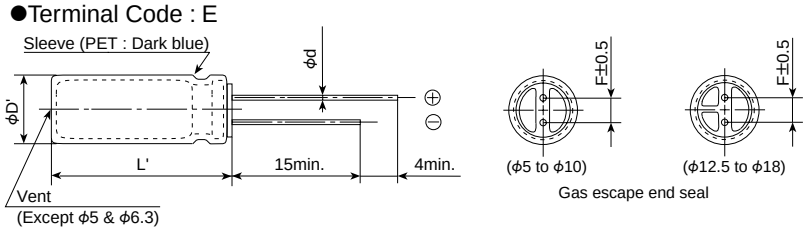
LXZ
↑ Lower Z, Downsized
LXY
↑ Lower Z
LXV

◆SPECIFICATIONS

Items	Characteristics							
Category Temperature Range	−55 to +105℃							
Rated Voltage Range	6.3 to 63Vdc							
Capacitance Tolerance	±20% (M)							(at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)							(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V
	tanδ (Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.08
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase.							(at 20℃, 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 the specified period of time at 105℃.							
	Time	φ5 & 6.3 : 2,000hours φ8 : 3,000hours φ10 : 5,000hours φ12.5 : 7,000hours φ16 & 18 : 8,000hours						
	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						

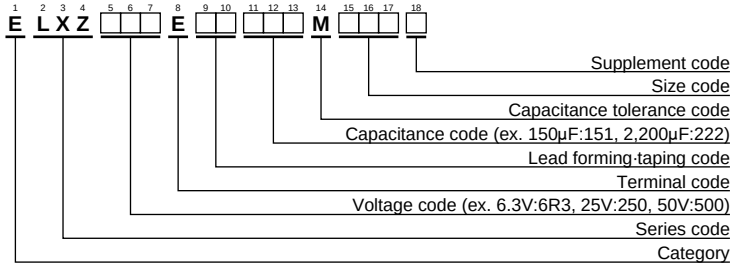
◆DIMENSIONS [mm]

●Terminal Code : E



φD	5	6.3	8	10	12.5	16	18
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φD'	φD+0.5max.						
L'	L+1.5max.						

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, Downsized, 105℃

LXZ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
6.3	150	5×11.5	0.50	1.0	175	ELXZ6R3E□□151MEB5D
	330	6.3×11.5	0.25	0.50	290	ELXZ6R3E□□331MFB5D
	470	6.3×15	0.18	0.36	400	ELXZ6R3E□□471MF15D
	680	8×12	0.12	0.24	555	ELXZ6R3E□□681MH12D
	820	10×12.5	0.090	0.18	760	ELXZ6R3E□□821MJC5S
	1,000	8×15	0.090	0.18	730	ELXZ6R3E□□102MH15D
	1,200	8×20	0.080	0.16	810	ELXZ6R3E□□122MH20D
	1,200	10×16	0.068	0.136	1,050	ELXZ6R3E□□122MJ16S
	1,500	10×20	0.052	0.104	1,220	ELXZ6R3E□□152MJ20S
	2,200	10×25	0.045	0.090	1,440	ELXZ6R3E□□222MJ25S
	2,700	10×30	0.037	0.074	1,690	ELXZ6R3E□□272MJ30S
	3,300	12.5×20	0.038	0.076	1,660	ELXZ6R3E□□332MK20S
	3,900	12.5×25	0.030	0.060	1,950	ELXZ6R3E□□392MK25S
	4,700	12.5×30	0.025	0.050	2,310	ELXZ6R3E□□472MK30S
	5,600	12.5×35	0.022	0.044	2,510	ELXZ6R3E□□562MK35S
	5,600	16×20	0.029	0.058	2,210	ELXZ6R3E□□562ML20S
	6,800	12.5×40	0.017	0.034	2,870	ELXZ6R3E□□682MK40S
	6,800	16×25	0.022	0.044	2,560	ELXZ6R3E□□682ML25S
	6,800	18×20	0.028	0.056	2,490	ELXZ6R3E□□682MM20S
	8,200	16×30	0.019	0.038	3,010	ELXZ6R3E□□822ML30S
	10,000	16×35	0.017	0.034	3,150	ELXZ6R3E□□103ML35S
	10,000	18×25	0.020	0.040	2,740	ELXZ6R3E□□103MM25S
	12,000	16×40	0.015	0.030	3,710	ELXZ6R3E□□123ML40S
	12,000	18×30	0.018	0.036	3,330	ELXZ6R3E□□123MM30S
	15,000	18×35	0.016	0.032	3,680	ELXZ6R3E□□153MM35S
	18,000	18×40	0.015	0.030	3,800	ELXZ6R3E□□183MM40S
10	100	5×11.5	0.50	1.0	175	ELXZ100E□□101MEB5D
	220	6.3×11.5	0.25	0.50	290	ELXZ100E□□221MFB5D
	330	6.3×15	0.18	0.36	400	ELXZ100E□□331MF15D
	470	8×12	0.12	0.24	555	ELXZ100E□□471MH12D
	680	8×15	0.090	0.18	730	ELXZ100E□□681MH15D
	680	10×12.5	0.090	0.18	760	ELXZ100E□□681MJC5S
	1,000	8×20	0.080	0.16	810	ELXZ100E□□102MH20D
	1,000	10×16	0.068	0.136	1,050	ELXZ100E□□102MJ16S
	1,200	10×20	0.052	0.104	1,220	ELXZ100E□□122MJ20S
	1,500	10×25	0.045	0.090	1,440	ELXZ100E□□152MJ25S
	1,800	10×30	0.037	0.074	1,690	ELXZ100E□□182MJ30S
	2,200	12.5×20	0.038	0.076	1,660	ELXZ100E□□222MK20S
	3,300	12.5×25	0.030	0.060	1,950	ELXZ100E□□332MK25S
	3,900	12.5×30	0.025	0.050	2,310	ELXZ100E□□392MK30S
	3,900	16×20	0.029	0.058	2,210	ELXZ100E□□392ML20S
	4,700	12.5×35	0.022	0.044	2,510	ELXZ100E□□472MK35S
	5,600	12.5×40	0.017	0.034	2,870	ELXZ100E□□562MK40S
	5,600	16×25	0.022	0.044	2,560	ELXZ100E□□562ML25S
	5,600	18×20	0.028	0.056	2,490	ELXZ100E□□562MM20S
	6,800	16×30	0.019	0.038	3,010	ELXZ100E□□682ML30S
	6,800	18×25	0.020	0.040	2,740	ELXZ100E□□682MM25S
	8,200	16×35	0.017	0.034	3,150	ELXZ100E□□822ML35S
	8,200	18×30	0.018	0.036	3,330	ELXZ100E□□822MM30S
	10,000	16×40	0.015	0.030	3,710	ELXZ100E□□103ML40S
	10,000	18×35	0.016	0.032	3,680	ELXZ100E□□103MM35S
	12,000	18×40	0.015	0.030	3,800	ELXZ100E□□123MM40S
16	47	5×11.5	0.50	1.0	175	ELXZ160E□□470MEB5D
	100	6.3×11.5	0.25	0.50	290	ELXZ160E□□101MFB5D
	220	6.3×15	0.18	0.36	400	ELXZ160E□□221MF15D
	330	8×12	0.12	0.24	555	ELXZ160E□□331MH12D
	470	8×15	0.090	0.18	730	ELXZ160E□□471MH15D
	470	10×12.5	0.090	0.18	760	ELXZ160E□□471MJC5S
	560	8×20	0.080	0.16	810	ELXZ160E□□561MH20D
	680	10×16	0.068	0.136	1,050	ELXZ160E□□681MJ16S
	1,000	10×20	0.052	0.104	1,220	ELXZ160E□□102MJ20S
	1,200	10×25	0.045	0.090	1,440	ELXZ160E□□122MJ25S
	1,500	10×30	0.037	0.074	1,690	ELXZ160E□□152MJ30S
	1,500	12.5×20	0.038	0.076	1,660	ELXZ160E□□152MK20S
	2,200	12.5×25	0.030	0.060	1,950	ELXZ160E□□222MK25S
	2,700	12.5×30	0.025	0.050	2,310	ELXZ160E□□272MK30S
	2,700	16×20	0.029	0.058	2,210	ELXZ160E□□272ML20S
16	3,300	12.5×35	0.022	0.044	2,510	ELXZ160E□□332MK35S
	3,900	12.5×40	0.017	0.034	2,870	ELXZ160E□□392MK40S
	3,900	16×25	0.022	0.044	2,560	ELXZ160E□□392ML25S
	3,900	18×20	0.028	0.056	2,490	ELXZ160E□□392MM20S
	4,700	16×30	0.019	0.038	3,010	ELXZ160E□□472ML30S
	4,700	18×25	0.020	0.040	2,740	ELXZ160E□□472MM25S
	5,600	16×35	0.017	0.034	3,150	ELXZ160E□□562ML35S
	5,600	18×30	0.018	0.036	3,330	ELXZ160E□□562MM30S
	6,800	16×40	0.015	0.030	3,710	ELXZ160E□□682ML40S
	8,200	18×35	0.016	0.032	3,680	ELXZ160E□□822MM35S
	10,000	18×40	0.015	0.030	3,800	ELXZ160E□□103MM40S
25	47	5×11.5	0.50	1.0	175	ELXZ250E□□470MEB5D
	100	6.3×11.5	0.25	0.50	290	ELXZ250E□□101MFB5D
	150	6.3×15	0.18	0.36	400	ELXZ250E□□151MF15D
	220	8×12	0.12	0.24	555	ELXZ250E□□221MH12D
	330	8×15	0.090	0.18	730	ELXZ250E□□331MH15D
	330	10×12.5	0.090	0.18	760	ELXZ250E□□331MJC5S
	390	8×20	0.080	0.16	810	ELXZ250E□□391MH20D
	470	10×16	0.068	0.136	1,050	ELXZ250E□□471MJ16S
	680	10×20	0.052	0.104	1,220	ELXZ250E□□681MJ20S
	820	10×25	0.045	0.090	1,440	ELXZ250E□□821MJ25S
	1,000	10×30	0.037	0.074	1,690	ELXZ250E□□102MJ30S
	1,000	12.5×20	0.038	0.076	1,660	ELXZ250E□□102MK20S
	1,500	12.5×25	0.030	0.060	1,950	ELXZ250E□□152MK25S
	1,800	12.5×30	0.025	0.050	2,310	ELXZ250E□□182MK30S
	1,800	16×20	0.029	0.058	2,210	ELXZ250E□□182ML20S
	2,200	12.5×35	0.022	0.044	2,510	ELXZ250E□□222MK35S
	2,200	18×20	0.028	0.056	2,490	ELXZ250E□□222MM20S
	2,700	12.5×40	0.017	0.034	2,870	ELXZ250E□□272MK40S
	2,700	16×25	0.022	0.044	2,560	ELXZ250E□□272ML25S
	3,300	16×30	0.019	0.038	3,010	ELXZ250E□□332ML30S
	3,300	18×25	0.020	0.040	2,740	ELXZ250E□□332MM25S
	3,900	16×35	0.017	0.034	3,150	ELXZ250E□□392ML35S
	3,900	18×30	0.018	0.036	3,330	ELXZ250E□□392MM30S
	4,700	16×40	0.015	0.030	3,710	ELXZ250E□□472ML40S
	4,700	18×35	0.016	0.032	3,680	ELXZ250E□□472MM35S
	5,600	18×40	0.015	0.030	3,800	ELXZ250E□□562MM40S
35	33	5×11.5	0.50	1.0	175	ELXZ350E□□330MEB5D
	56	6.3×11.5	0.25	0.50	290	ELXZ350E□□560MFB5D
	100	6.3×15	0.18	0.36	400	ELXZ350E□□101MF15D
	150	8×12	0.12	0.24	555	ELXZ350E□□151MH12D
	220	8×15	0.090	0.18	730	ELXZ350E□□221MH15D
	220	10×12.5	0.090	0.18	760	ELXZ350E□□221MJC5S
	270	8×20	0.080	0.16	810	ELXZ350E□□271MH20D
	330	10×16	0.068	0.136	1,050	ELXZ350E□□331MJ16S
	470	10×20	0.052	0.104	1,220	ELXZ350E□□471MJ20S
	560	10×25	0.045	0.090	1,440	ELXZ350E□□561MJ25S
	680	10×30	0.037	0.074	1,690	ELXZ350E□□681MJ30S
	680	12.5×20	0.038	0.076	1,660	ELXZ350E□□681MK20S
	1,000	12.5×25	0.030	0.060	1,950	ELXZ350E□□102MK25S
	1,200	12.5×30	0.025	0.050	2,310	ELXZ350E□□122MK30S
	1,200	16×20	0.029	0.058	2,210	ELXZ350E□□122ML20S
	1,500	12.5×35	0.022	0.044	2,510	ELXZ350E□□152MK35S
	1,800	12.5×40	0.017	0.034	2,870	ELXZ350E□□182MK40S
	1,800	16×25	0.022	0.044	2,560	ELXZ350E□□182ML25S
	1,800	18×20	0.028	0.056	2,490	ELXZ350E□□182MM20S
	2,200	16×30	0.019	0.038	3,010	ELXZ350E□□222ML30S
	2,200	18×25	0.020	0.040	2,740	ELXZ350E□□222MM25S
	2,700	16×35	0.017	0.034	3,150	ELXZ350E□□272ML35S
	2,700	18×30	0.018	0.036	3,330	ELXZ350E□□272MM30S
	3,300	16×40	0.015	0.030	3,710	ELXZ350E□□332ML40S
	3,300	18×35	0.016	0.032	3,680	ELXZ350E□□332MM35S
	3,900	18×40	0.015	0.030	3,800	ELXZ350E□□392MM40S
50	22	5×11.5	0.90	1.8	155	ELXZ500E□□220MEB5D
	47	6.3×11.5	0.45	0.90	260	ELXZ500E□□470MFB5D
	68	6.3×15	0.31	0.62	360	ELXZ500E□□680MF15D
	100	8×12	0.22	0.44	485	ELXZ500E□□101MH12D

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, Downsized, 105℃

LXZ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz)		Rated ripple current (mArms/105℃, 100kHz)	Part No.
			20℃	-10℃		
50	120	8×15	0.16	0.32	635	ELXZ500E□□121MH15D
	120	10×12.5	0.16	0.32	620	ELXZ500E□□121MJC5S
	180	8×20	0.12	0.24	730	ELXZ500E□□181MH20D
	180	10×16	0.13	0.26	850	ELXZ500E□□181MJ16S
	220	10×20	0.088	0.18	1,050	ELXZ500E□□221MJ20S
	330	10×25	0.073	0.15	1,250	ELXZ500E□□331MJ25S
	390	10×30	0.054	0.11	1,500	ELXZ500E□□391MJ30S
	390	12.5×20	0.059	0.12	1,480	ELXZ500E□□391MK20S
	560	12.5×25	0.044	0.088	1,840	ELXZ500E□□561MK25S
	680	12.5×30	0.039	0.078	2,220	ELXZ500E□□681MK30S
	680	16×20	0.048	0.096	1,840	ELXZ500E□□681ML20S
	820	12.5×35	0.033	0.066	2,290	ELXZ500E□□821MK35S
	820	18×20	0.042	0.084	1,980	ELXZ500E□□821MM20S
	1,000	12.5×40	0.029	0.058	2,500	ELXZ500E□□102MK40S
	1,000	16×25	0.034	0.068	2,240	ELXZ500E□□102ML25S
	1,200	16×30	0.028	0.056	2,700	ELXZ500E□□122ML30S
	1,200	18×25	0.029	0.058	2,610	ELXZ500E□□122MM25S
	1,500	16×35	0.025	0.050	2,800	ELXZ500E□□152ML35S
	1,800	16×40	0.021	0.042	3,200	ELXZ500E□□182ML40S
	1,800	18×30	0.025	0.050	3,000	ELXZ500E□□182MM30S
	2,200	18×35	0.023	0.046	3,100	ELXZ500E□□222MM35S
	2,700	18×40	0.020	0.040	3,400	ELXZ500E□□272MM40S
63	12	5×11.5	1.9	4.0	145	ELXZ630E□□120MEB5D
	22	6.3×11.5	1.0	2.0	240	ELXZ630E□□220MFB5D

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz)		Rated ripple current (mArms/105℃, 100kHz)	Part No.
			20℃	-10℃		
63	39	6.3×15	0.61	1.4	330	ELXZ630E□□390MF15D
	68	8×12	0.34	0.75	405	ELXZ630E□□680MH12D
	100	8×15	0.27	0.65	535	ELXZ630E□□101MH15D
	100	10×12.5	0.255	0.51	540	ELXZ630E□□101MJC5S
	120	10×16	0.19	0.38	600	ELXZ630E□□121MJ16S
	150	8×20	0.21	0.52	690	ELXZ630E□□151MH20D
	180	10×20	0.145	0.29	890	ELXZ630E□□181MJ20S
	220	10×25	0.13	0.26	1,050	ELXZ630E□□221MJ25S
	330	10×30	0.090	0.18	1,300	ELXZ630E□□331MJ30S
	330	12.5×20	0.085	0.17	1,290	ELXZ630E□□331MK20S
	390	12.5×25	0.070	0.14	1,720	ELXZ630E□□391MK25S
	470	12.5×30	0.055	0.11	2,090	ELXZ630E□□471MK30S
	470	16×20	0.059	0.12	1,770	ELXZ630E□□471ML20S
	680	12.5×35	0.047	0.094	2,270	ELXZ630E□□681MK35S
	680	16×25	0.050	0.10	2,160	ELXZ630E□□681ML25S
	680	18×20	0.055	0.11	2,290	ELXZ630E□□681MM20S
	820	12.5×40	0.042	0.084	2,560	ELXZ630E□□821MK40S
	820	16×30	0.043	0.086	2,670	ELXZ630E□□821ML30S
	820	18×25	0.043	0.086	2,590	ELXZ630E□□821MM25S
	1,000	16×35	0.036	0.072	2,770	ELXZ630E□□102ML35S
	1,200	16×40	0.030	0.060	2,850	ELXZ630E□□122ML40S
	1,200	18×30	0.032	0.064	2,950	ELXZ630E□□122MM30S
	1,500	18×35	0.030	0.060	3,100	ELXZ630E□□152MM35S
	1,800	18×40	0.025	0.050	3,210	ELXZ630E□□182MM40S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
12 to 180	0.40	0.75	0.90	1.00
220 to 560	0.50	0.85	0.94	1.00
680 to 1,800	0.60	0.87	0.95	1.00
2,200 to 3,900	0.75	0.90	0.95	1.00
4,700 to 18,000	0.85	0.95	0.98	1.00

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

High reliability, Low impedance, 105℃

LXY Series

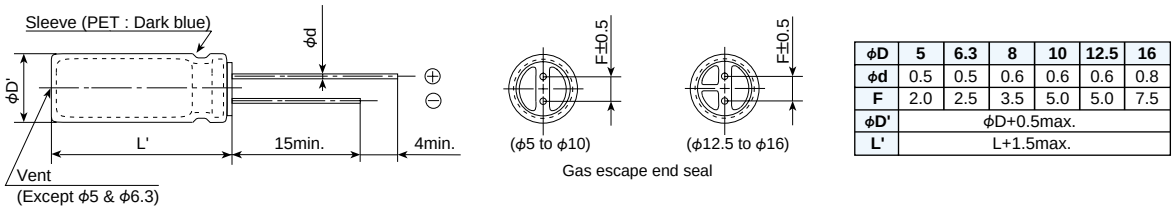
- Newly innovative electrolyte and internal architecture are employed
- Endurance with ripple current : 2,000 to 8,000 hours at 105℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

◆SPECIFICATIONS

Items	Characteristics						
Category Temperature Range	−55 to +105℃						
Rated Voltage Range	10 to 63Vdc						
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)						
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)						
Dissipation Factor (tanδ)	Rated voltage (Vdc)	10V	16V	25V	35V	50V	63V
	tanδ (Max.)	0.19	0.16	0.14	0.12	0.10	0.10
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)						
Low Temperature Characteristics (Max. Impedance Ratio)	Z(−55℃)/Z(+20℃)	10Vdc to 50Vdc : 3max.					
		63Vdc : 6max.					
	(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 the specified period of time at 105℃.						
	Time	φ5 & 6.3 : 2,000hours φ8 : 3,000hours φ10 : 5,000hours φ12.5 : 7,000hours φ16 & 18 : 8,000hours					
	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					

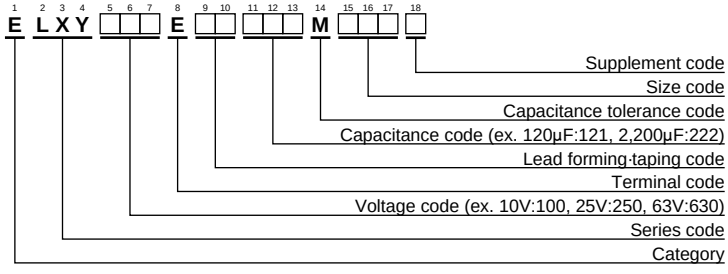
◆DIMENSIONS [mm]

- Terminal Code : E



φD	5	6.3	8	10	12.5	16
φd	0.5	0.5	0.6	0.6	0.6	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5
φD'	φD+0.5max.					
L'	L+1.5max.					

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

◆RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
10 to 180	0.40	0.75	0.90	1.00
220 to 560	0.50	0.85	0.94	1.00
680 to 1,800	0.60	0.87	0.95	1.00
2,200 to 3,900	0.75	0.90	0.95	1.00
4,700 to 8,200	0.85	0.95	0.98	1.00

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

High reliability, Low impedance, 105℃

LXY Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
10	82	5×11.5	0.75	1.5	163	ELXY100E□□820MEB5D
	180	6.3×11.5	0.35	0.70	273	ELXY100E□□181MFB5D
	220	6.3×15	0.25	0.50	390	ELXY100E□□221MF15D
	330	8×12	0.17	0.34	445	ELXY100E□□331MH12D
	390	10×12.5	0.12	0.24	625	ELXY100E□□391MJC5S
	470	8×15	0.13	0.26	555	ELXY100E□□471MH15D
	680	8×20	0.095	0.19	740	ELXY100E□□681MH20D
	680	10×16	0.084	0.17	825	ELXY100E□□681MJ16S
	1,000	10×20	0.062	0.13	1,040	ELXY100E□□102MJ20S
	1,200	10×25	0.052	0.11	1,260	ELXY100E□□122MJ25S
	1,500	10×30	0.044	0.088	1,440	ELXY100E□□152MJ30S
	1,800	12.5×20	0.046	0.092	1,340	ELXY100E□□182MK20S
	2,200	12.5×25	0.034	0.068	1,690	ELXY100E□□222MK25S
	2,700	12.5×30	0.030	0.060	1,950	ELXY100E□□272MK30S
	3,300	12.5×35	0.024	0.048	2,220	ELXY100E□□332MK35S
	3,300	16×20	0.038	0.076	1,630	ELXY100E□□332ML20S
	3,900	12.5×40	0.022	0.044	2,390	ELXY100E□□392MK40S
	3,900	16×25	0.028	0.056	2,070	ELXY100E□□392ML25S
	5,600	16×30	0.025	0.050	2,350	ELXY100E□□562ML30S
	6,800	16×35	0.022	0.044	2,550	ELXY100E□□682ML35S
	8,200	16×40	0.018	0.036	2,900	ELXY100E□□822ML40S
16	56	5×11.5	0.75	1.5	163	ELXY160E□□560MEB5D
	120	6.3×11.5	0.35	0.70	273	ELXY160E□□121MFB5D
	180	6.3×15	0.25	0.50	390	ELXY160E□□181MF15D
	270	8×12	0.17	0.34	445	ELXY160E□□271MH12D
	270	10×12.5	0.12	0.24	625	ELXY160E□□271MJC5S
	330	8×15	0.13	0.26	555	ELXY160E□□331MH15D
	470	8×20	0.095	0.19	740	ELXY160E□□471MH20D
	470	10×16	0.084	0.17	825	ELXY160E□□471MJ16S
	680	10×20	0.062	0.13	1,040	ELXY160E□□681MJ20S
	820	10×25	0.052	0.11	1,260	ELXY160E□□821MJ25S
	1,200	10×30	0.044	0.088	1,440	ELXY160E□□122MJ30S
	1,200	12.5×20	0.046	0.092	1,340	ELXY160E□□122MK20S
	1,500	12.5×25	0.034	0.068	1,690	ELXY160E□□152MK25S
	2,200	12.5×30	0.030	0.060	1,950	ELXY160E□□222MK30S
	2,200	16×20	0.038	0.076	1,630	ELXY160E□□222ML20S
	2,700	12.5×35	0.024	0.048	2,220	ELXY160E□□272MK35S
	2,700	16×25	0.028	0.056	2,070	ELXY160E□□272ML25S
	3,300	12.5×40	0.022	0.044	2,390	ELXY160E□□332MK40S
	3,900	16×30	0.025	0.050	2,350	ELXY160E□□392ML30S
	4,700	16×35	0.022	0.044	2,550	ELXY160E□□472ML35S
	5,600	16×40	0.018	0.036	2,900	ELXY160E□□562ML40S
25	39	5×11.5	0.75	1.5	163	ELXY250E□□390MEB5D
	82	6.3×11.5	0.35	0.70	273	ELXY250E□□820MFB5D
	120	6.3×15	0.25	0.50	390	ELXY250E□□121MF15D
	150	8×12	0.17	0.34	445	ELXY250E□□151MH12D
	180	10×12.5	0.12	0.24	625	ELXY250E□□181MJC5S
	220	8×15	0.13	0.26	555	ELXY250E□□221MH15D
	330	8×20	0.095	0.19	740	ELXY250E□□331MH20D
	330	10×16	0.084	0.17	825	ELXY250E□□331MJ16S
	470	10×20	0.062	0.13	1,040	ELXY250E□□471MJ20S
	560	10×25	0.052	0.11	1,260	ELXY250E□□561MJ25S
	820	10×30	0.044	0.088	1,440	ELXY250E□□821MJ30S
	820	12.5×20	0.046	0.092	1,340	ELXY250E□□821MK20S
	1,000	12.5×25	0.034	0.068	1,690	ELXY250E□□102MK25S
	1,500	12.5×30	0.030	0.060	1,950	ELXY250E□□152MK30S
	1,500	16×20	0.038	0.076	1,630	ELXY250E□□152ML20S
	1,800	12.5×35	0.024	0.048	2,220	ELXY250E□□182MK35S
	1,800	16×25	0.028	0.056	2,070	ELXY250E□□182ML25S
	2,200	12.5×40	0.022	0.044	2,390	ELXY250E□□222MK40S
	2,700	16×30	0.025	0.050	2,350	ELXY250E□□272ML30S
	3,300	16×35	0.022	0.044	2,550	ELXY250E□□332ML35S
	3,900	16×40	0.018	0.036	2,900	ELXY250E□□392ML40S
35	27	5×11.5	0.75	1.5	163	ELXY350E□□270MEB5D
	56	6.3×11.5	0.35	0.70	273	ELXY350E□□560MFB5D
	82	6.3×15	0.25	0.50	390	ELXY350E□□820MF15D
	120	8×12	0.17	0.34	445	ELXY350E□□121MH12D
	120	10×12.5	0.12	0.24	625	ELXY350E□□121MJC5S
	180	8×15	0.13	0.26	555	ELXY350E□□181MH15D
	220	8×20	0.095	0.19	740	ELXY350E□□221MH20D
	220	10×16	0.084	0.17	825	ELXY350E□□221MJ16S
	330	10×20	0.062	0.13	1,040	ELXY350E□□331MJ20S
	390	10×25	0.052	0.11	1,260	ELXY350E□□391MJ25S
	560	10×30	0.044	0.088	1,440	ELXY350E□□561MJ30S
	560	12.5×20	0.046	0.092	1,340	ELXY350E□□561MK20S
	680	12.5×25	0.034	0.068	1,690	ELXY350E□□681MK25S
	1,000	12.5×30	0.030	0.060	1,950	ELXY350E□□102MK30S
	1,000	16×20	0.038	0.076	1,630	ELXY350E□□102ML20S
	1,200	12.5×35	0.024	0.048	2,220	ELXY350E□□122MK35S
	1,200	16×25	0.028	0.056	2,070	ELXY350E□□122ML25S
	1,500	12.5×40	0.022	0.044	2,390	ELXY350E□□152MK40S
	1,800	16×30	0.025	0.050	2,350	ELXY350E□□182ML30S
	2,200	16×35	0.022	0.044	2,550	ELXY350E□□222ML35S
	2,700	16×40	0.018	0.036	2,900	ELXY350E□□272ML40S
50	18	5×11.5	1.2	2.4	129	ELXY500E□□180MEB5D
	39	6.3×11.5	0.54	1.1	219	ELXY500E□□390MFB5D
	56	6.3×15	0.34	0.68	310	ELXY500E□□560MF15D
	68	8×12	0.30	0.60	340	ELXY500E□□680MH12D
	82	8×15	0.20	0.40	470	ELXY500E□□820MH15D
	82	10×12.5	0.20	0.40	480	ELXY500E□□820MJC5S
	120	8×20	0.14	0.28	610	ELXY500E□□121MH20D
	120	10×16	0.13	0.26	755	ELXY500E□□121MJ16S
	180	10×20	0.088	0.18	945	ELXY500E□□181MJ20S
	220	10×25	0.073	0.15	1,150	ELXY500E□□221MJ25S
	330	10×30	0.054	0.11	1,260	ELXY500E□□331MJ30S
	330	12.5×20	0.059	0.12	1,190	ELXY500E□□331MK20S
	470	12.5×25	0.044	0.088	1,490	ELXY500E□□471MK25S
	560	12.5×30	0.039	0.078	1,720	ELXY500E□□561MK30S
	680	12.5×35	0.033	0.066	1,890	ELXY500E□□681MK35S
	680	16×20	0.050	0.10	1,420	ELXY500E□□681ML20S
	820	12.5×40	0.029	0.058	2,030	ELXY500E□□821MK40S
	820	16×25	0.034	0.068	1,880	ELXY500E□□821ML25S
	1,000	16×30	0.030	0.060	2,150	ELXY500E□□102ML30S
	1,200	16×35	0.027	0.054	2,320	ELXY500E□□122ML35S
	1,500	16×40	0.024	0.048	2,540	ELXY500E□□152ML40S
63	10	5×11.5	1.9	4.8	103	ELXY630E□□100MEB5D
	18	6.3×11.5	1.0	2.5	161	ELXY630E□□180MFB5D
	33	6.3×15	0.61	1.6	233	ELXY630E□□330MF15D
	47	8×12	0.47	1.2	274	ELXY630E□□470MH12D
	56	10×12.5	0.27	0.68	418	ELXY630E□□560MJC5S
	68	8×15	0.34	0.85	360	ELXY630E□□680MH15D
	68	10×16	0.21	0.53	525	ELXY630E□□680MJ16S
	82	8×20	0.21	0.53	500	ELXY630E□□820MH20D
	120	10×20	0.16	0.40	650	ELXY630E□□121MJ20S
	150	10×25	0.13	0.33	783	ELXY630E□□151MJ25S
	180	10×30	0.10	0.25	960	ELXY630E□□181MJ30S
	220	12.5×20	0.11	0.28	870	ELXY630E□□221MK20S
	270	12.5×25	0.074	0.19	1,150	ELXY630E□□271MK25S
	330	16×20	0.085	0.22	1,100	ELXY630E□□331ML20S
	390	12.5×30	0.068	0.17	1,280	ELXY630E□□391MK30S
	470	12.5×35	0.063	0.16	1,390	ELXY630E□□471MK35S
	470	16×25	0.055	0.14	1,480	ELXY630E□□471ML25S
	560	12.5×40	0.051	0.13	1,530	ELXY630E□□561MK40S
	680	16×30	0.046	0.12	1,720	ELXY630E□□681ML30S
	820	16×35	0.040	0.10	1,910	ELXY630E□□821ML35S
	1,000	16×40	0.036	0.09	2,070	ELXY630E□□102ML40S

□□ : Fill with appropriate lead forming or taping code.

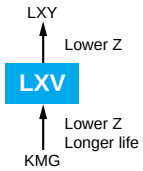
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

LXV Series

- Low impedance
- Endurance with ripple current : 2,000 to 5,000 hours at 105℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

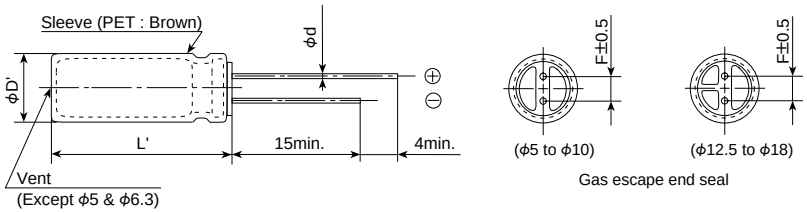


◆SPECIFICATIONS

Items	Characteristics									
Category Temperature Range	−55 to +105℃									
Rated Voltage Range	6.3 to 100Vdc									
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)									
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)									
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	80V	100V
	tanδ (Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.10	0.09	0.08
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)									
Low Temperature Characteristics	Capacitance change ΔC (−55℃ /+20℃)	0.7min.								
	Max. impedance ratio (−55℃ /+20℃)	3max.(6.3Vdc : 4max.) (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 the specified period of time at 105℃.									
	Time	φ5 to 6.3 : 2,000hours φ8 & 10 : 3,000hours φ12.5 to φ18 : 5,000hours								
	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								

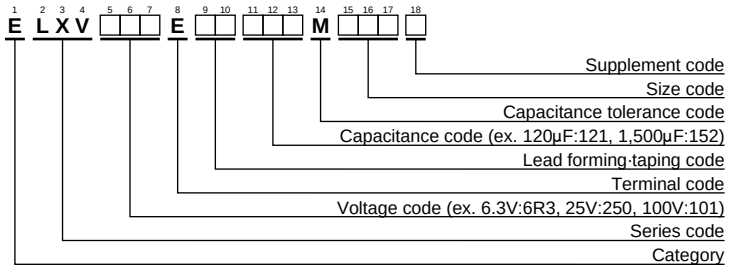
◆DIMENSIONS [mm]

- Terminal Code : E



φD	5	6.3	8	10	12.5	16	18
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φD'	φD+0.5max.						
L'	L+1.5max.						

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

LXV Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
6.3	120	5×11.5	0.72	1.8	165	ELXV6R3E□□121MEB5D
	220	6.3×11.5	0.38	0.95	255	ELXV6R3E□□221MFB5D
	330	6.3×15	0.27	0.68	330	ELXV6R3E□□331MF15D
	390	8×12	0.20	0.50	415	ELXV6R3E□□391MH12D
	470	10×12.5	0.12	0.30	635	ELXV6R3E□□471MJC5S
	560	8×15	0.16	0.40	495	ELXV6R3E□□561MH15D
	680	10×16	0.084	0.21	825	ELXV6R3E□□681MJ16S
	820	8×20	0.11	0.28	640	ELXV6R3E□□821MH20D
	1,200	10×20	0.062	0.16	1,060	ELXV6R3E□□122MJ20S
	1,500	10×25	0.052	0.13	1,260	ELXV6R3E□□152MJ25S
	2,200	10×30	0.044	0.11	1,450	ELXV6R3E□□222MJ30S
	2,200	12.5×20	0.046	0.12	1,360	ELXV6R3E□□222MK20S
	2,700	12.5×25	0.034	0.085	1,700	ELXV6R3E□□272MK25S
	3,900	12.5×30	0.030	0.075	1,980	ELXV6R3E□□392MK30S
	3,900	16×20	0.038	0.095	1,770	ELXV6R3E□□392ML20S
	4,700	12.5×35	0.027	0.068	2,230	ELXV6R3E□□472MK35S
	5,600	12.5×40	0.024	0.060	2,460	ELXV6R3E□□562MK40S
	5,600	16×25	0.028	0.070	2,190	ELXV6R3E□□562ML25S
	5,600	18×20	0.036	0.090	1,940	ELXV6R3E□□562MM20S
	6,800	16×30	0.025	0.063	2,510	ELXV6R3E□□682ML30S
	6,800	18×25	0.027	0.068	2,350	ELXV6R3E□□682MM25S
	8,200	16×35	0.022	0.055	2,770	ELXV6R3E□□822ML35S
	10,000	16×40	0.018	0.045	3,110	ELXV6R3E□□103ML40S
	10,000	18×30	0.024	0.060	2,720	ELXV6R3E□□103MM30S
	12,000	18×35	0.021	0.053	3,050	ELXV6R3E□□123MM35S
	15,000	18×40	0.017	0.043	3,300	ELXV6R3E□□153MM40S
10	82	5×11.5	0.72	1.8	165	ELXV100E□□820MEB5D
	180	6.3×11.5	0.38	0.95	255	ELXV100E□□181MFB5D
	270	6.3×15	0.27	0.68	330	ELXV100E□□271MF15D
	330	8×12	0.20	0.50	415	ELXV100E□□331MH12D
	390	10×12.5	0.12	0.30	635	ELXV100E□□391MJC5S
	470	8×15	0.16	0.40	495	ELXV100E□□471MH15D
	680	8×20	0.11	0.28	640	ELXV100E□□681MH20D
	680	10×16	0.084	0.21	825	ELXV100E□□681MJ16S
	1,000	10×20	0.062	0.16	1,060	ELXV100E□□102MJ20S
	1,200	10×25	0.052	0.13	1,260	ELXV100E□□122MJ25S
	1,500	10×30	0.044	0.11	1,450	ELXV100E□□152MJ30S
	1,800	12.5×20	0.046	0.12	1,360	ELXV100E□□182MK20S
	2,200	12.5×25	0.034	0.085	1,700	ELXV100E□□222MK25S
	2,700	12.5×30	0.030	0.075	1,980	ELXV100E□□272MK30S
	3,300	12.5×35	0.027	0.068	2,230	ELXV100E□□332MK35S
	3,300	16×20	0.038	0.095	1,770	ELXV100E□□332ML20S
	3,900	12.5×40	0.024	0.060	2,460	ELXV100E□□392MK40S
	3,900	16×25	0.028	0.070	2,190	ELXV100E□□392ML25S
	3,900	18×20	0.036	0.090	1,940	ELXV100E□□392MM20S
	4,700	18×25	0.027	0.068	2,350	ELXV100E□□472MM25S
	5,600	16×30	0.025	0.063	2,510	ELXV100E□□562ML30S
	6,800	16×35	0.022	0.055	2,770	ELXV100E□□682ML35S
	6,800	18×30	0.024	0.060	2,720	ELXV100E□□682MM30S
	8,200	16×40	0.018	0.045	3,110	ELXV100E□□822ML40S
	8,200	18×35	0.021	0.053	3,050	ELXV100E□□822MM35S
	10,000	18×40	0.017	0.043	3,300	ELXV100E□□103MM40S
16	56	5×11.5	0.72	1.8	165	ELXV160E□□560MEB5D
	120	6.3×11.5	0.38	0.95	255	ELXV160E□□121MFB5D
	180	6.3×15	0.27	0.68	330	ELXV160E□□181MF15D
	270	8×12	0.20	0.50	415	ELXV160E□□271MH12D
	270	10×12.5	0.12	0.30	635	ELXV160E□□271MJC5S
	330	8×15	0.16	0.40	495	ELXV160E□□331MH15D
	470	8×20	0.11	0.28	640	ELXV160E□□471MH20D
	470	10×16	0.084	0.21	825	ELXV160E□□471MJ16S
	680	10×20	0.062	0.16	1,060	ELXV160E□□681MJ20S
	820	10×25	0.052	0.13	1,260	ELXV160E□□821MJ25S
	1,200	10×30	0.044	0.11	1,450	ELXV160E□□122MJ30S
	1,200	12.5×20	0.046	0.12	1,360	ELXV160E□□122MK20S
	1,500	12.5×25	0.034	0.085	1,700	ELXV160E□□152MK25S
	2,200	12.5×30	0.030	0.075	1,980	ELXV160E□□222MK30S
	2,200	16×20	0.038	0.095	1,770	ELXV160E□□222ML20S
16	2,700	12.5×35	0.027	0.068	2,230	ELXV160E□□272MK35S
	2,700	16×25	0.028	0.070	2,190	ELXV160E□□272ML25S
	3,300	12.5×40	0.024	0.060	2,460	ELXV160E□□332MK40S
	3,300	18×20	0.036	0.090	1,940	ELXV160E□□332MM20S
	3,900	16×30	0.025	0.063	2,510	ELXV160E□□392ML30S
	3,900	18×25	0.027	0.068	2,350	ELXV160E□□392MM25S
	4,700	16×35	0.022	0.055	2,770	ELXV160E□□472ML35S
	4,700	18×30	0.024	0.060	2,720	ELXV160E□□472MM30S
	5,600	16×40	0.018	0.045	3,110	ELXV160E□□562ML40S
	6,800	18×35	0.021	0.053	3,050	ELXV160E□□682MM35S
	8,200	18×40	0.017	0.043	3,300	ELXV160E□□822MM40S
25	39	5×11.5	0.72	1.8	165	ELXV250E□□390MEB5D
	82	6.3×11.5	0.38	0.95	255	ELXV250E□□820MFB5D
	120	6.3×15	0.27	0.68	330	ELXV250E□□121MF15D
	150	8×12	0.20	0.50	415	ELXV250E□□151MH12D
	180	10×12.5	0.12	0.30	635	ELXV250E□□181MJC5S
	220	8×15	0.16	0.40	495	ELXV250E□□221MH15D
	330	8×20	0.11	0.28	640	ELXV250E□□331MH20D
	330	10×16	0.084	0.21	825	ELXV250E□□331MJ16S
	470	10×20	0.062	0.16	1,060	ELXV250E□□471MJ20S
	560	10×25	0.052	0.13	1,260	ELXV250E□□561MJ25S
	820	10×30	0.044	0.11	1,450	ELXV250E□□821MJ30S
	820	12.5×20	0.046	0.12	1,360	ELXV250E□□821MK20S
	1,000	12.5×25	0.034	0.085	1,700	ELXV250E□□102MK25S
	1,500	12.5×30	0.030	0.075	1,980	ELXV250E□□152MK30S
	1,500	16×20	0.038	0.095	1,770	ELXV250E□□152ML20S
	1,800	12.5×35	0.027	0.068	2,230	ELXV250E□□182MK35S
	1,800	16×25	0.028	0.070	2,190	ELXV250E□□182ML25S
	2,200	12.5×40	0.024	0.060	2,460	ELXV250E□□222MK40S
	2,200	18×20	0.036	0.090	1,940	ELXV250E□□222MM20S
	2,700	16×30	0.025	0.063	2,510	ELXV250E□□272ML30S
	2,700	18×25	0.027	0.068	2,350	ELXV250E□□272MM25S
	3,300	16×35	0.022	0.055	2,770	ELXV250E□□332ML35S
	3,300	18×30	0.024	0.060	2,720	ELXV250E□□332MM30S
	3,900	16×40	0.018	0.045	3,110	ELXV250E□□392ML40S
	3,900	18×35	0.021	0.053	3,050	ELXV250E□□392MM35S
	4,700	18×40	0.017	0.043	3,300	ELXV250E□□472MM40S
35	27	5×11.5	0.72	1.8	165	ELXV350E□□270MEB5D
	56	6.3×11.5	0.38	0.95	255	ELXV350E□□560MFB5D
	82	6.3×15	0.27	0.68	330	ELXV350E□□820MF15D
	120	8×12	0.20	0.50	415	ELXV350E□□121MH12D
	120	10×12.5	0.12	0.30	635	ELXV350E□□121MJC5S
	180	8×15	0.16	0.40	495	ELXV350E□□181MH15D
	220	8×20	0.11	0.28	640	ELXV350E□□221MH20D
	220	10×16	0.084	0.21	825	ELXV350E□□221MJ16S
	330	10×20	0.062	0.16	1,060	ELXV350E□□331MJ20S
	390	10×25	0.052	0.13	1,260	ELXV350E□□391MJ25S
	560	10×30	0.044	0.11	1,450	ELXV350E□□561MJ30S
	560	12.5×20	0.046	0.12	1,360	ELXV350E□□561MK20S
	680	12.5×25	0.034	0.085	1,700	ELXV350E□□681MK25S
	1,000	12.5×30	0.030	0.075	1,980	ELXV350E□□102MK30S
	1,000	16×20	0.038	0.095	1,770	ELXV350E□□102ML20S
	1,200	12.5×35	0.027	0.068	2,230	ELXV350E□□122MK35S
	1,200	16×25	0.028	0.070	2,190	ELXV350E□□122ML25S
	1,500	12.5×40	0.024	0.060	2,460	ELXV350E□□152MK40S
	1,500	18×20	0.036	0.090	1,940	ELXV350E□□152MM20S
	1,800	16×30	0.025	0.063	2,510	ELXV350E□□182ML30S
	1,800	18×25	0.027	0.068	2,350	ELXV350E□□182MM25S
	2,200	16×35	0.022	0.055	2,770	ELXV350E□□222ML35S
	2,200	18×30	0.024	0.060	2,720	ELXV350E□□222MM30S
	2,700	16×40	0.018	0.045	3,110	ELXV350E□□272ML40S
	2,700	18×35	0.021	0.053	3,050	ELXV350E□□272MM35S
	3,300	18×40	0.017	0.043	3,300	ELXV350E□□332MM40S
50	18	5×11.5	1.1	3.3	165	ELXV500E□□180MEB5D
	39	6.3×11.5	0.56	1.6	255	ELXV500E□□390MFB5D
	56	6.3×15	0.41	1.2	310	ELXV500E□□560MF15D
	68	8×12	0.29	0.84	415	ELXV500E□□680MH12D

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105℃

LXV Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
50	82	8×15	0.24	0.72	505	ELXV500E□□820MH15D
	82	10×12.5	0.16	0.40	530	ELXV500E□□820MJC5S
	120	8×20	0.18	0.52	610	ELXV500E□□121MH20D
	120	10×16	0.12	0.30	755	ELXV500E□□121MJ16S
	180	10×20	0.088	0.22	945	ELXV500E□□181MJ20S
	220	10×25	0.068	0.17	1,150	ELXV500E□□221MJ25S
	330	10×30	0.059	0.15	1,260	ELXV500E□□331MJ30S
	330	12.5×20	0.059	0.15	1,190	ELXV500E□□331MK20S
	470	12.5×25	0.045	0.11	1,500	ELXV500E□□471MK25S
	560	12.5×30	0.039	0.098	1,720	ELXV500E□□561MK30S
	680	12.5×35	0.033	0.083	1,900	ELXV500E□□681MK35S
	680	16×20	0.043	0.11	1,500	ELXV500E□□681ML20S
	820	12.5×40	0.029	0.073	2,120	ELXV500E□□821MK40S
	820	16×25	0.033	0.083	1,880	ELXV500E□□821ML25S
	820	18×20	0.039	0.098	1,660	ELXV500E□□821MM20S
	1,000	16×30	0.029	0.073	2,150	ELXV500E□□102ML30S
	1,000	18×25	0.030	0.075	2,020	ELXV500E□□102MM25S
	1,200	16×35	0.025	0.063	2,320	ELXV500E□□122ML35S
	1,500	16×40	0.021	0.053	2,650	ELXV500E□□152ML40S
	1,500	18×30	0.026	0.065	2,340	ELXV500E□□152MM30S
	1,800	18×35	0.023	0.058	2,620	ELXV500E□□182MM35S
	2,200	18×40	0.020	0.050	2,790	ELXV500E□□222MM40S
63	12	5×11.5	1.9	4.8	100	ELXV630E□□120MEB5D
	27	6.3×11.5	1.1	2.8	160	ELXV630E□□270MFB5D
	39	6.3×15	0.62	1.6	230	ELXV630E□□390MF15D
	47	8×12	0.49	1.3	275	ELXV630E□□470MH12D
	56	10×12.5	0.27	0.68	420	ELXV630E□□560MJC5S
	68	8×15	0.34	0.85	360	ELXV630E□□680MH15D
	68	10×16	0.21	0.53	523	ELXV630E□□680MJ16S
	82	8×20	0.21	0.53	500	ELXV630E□□820MH20D
	120	10×20	0.16	0.40	650	ELXV630E□□121MJ20S
	150	10×25	0.13	0.33	780	ELXV630E□□151MJ25S
	180	10×30	0.10	0.25	960	ELXV630E□□181MJ30S
	220	12.5×20	0.11	0.28	870	ELXV630E□□221MK20S
	270	12.5×25	0.074	0.19	1,150	ELXV630E□□271MK25S
	390	12.5×30	0.068	0.17	1,280	ELXV630E□□391MK30S
	390	16×20	0.085	0.22	1,100	ELXV630E□□391ML20S
	470	12.5×35	0.063	0.16	1,390	ELXV630E□□471MK35S
	470	16×25	0.055	0.14	1,480	ELXV630E□□471ML25S
	560	12.5×40	0.051	0.13	1,530	ELXV630E□□561MK40S
	560	18×20	0.085	0.22	1,170	ELXV630E□□561MM20S
	680	16×30	0.046	0.12	1,720	ELXV630E□□681ML30S
	680	18×25	0.055	0.14	1,520	ELXV630E□□681MM25S
	820	16×35	0.040	0.10	1,910	ELXV630E□□821ML35S
	820	18×30	0.046	0.12	1,770	ELXV630E□□821MM30S
	1,000	16×40	0.036	0.09	2,070	ELXV630E□□102ML40S
	1,000	18×35	0.040	0.10	1,970	ELXV630E□□102MM35S
	1,200	18×40	0.036	0.09	2,130	ELXV630E□□122MM40S
80	8.2	5×11.5	1.9	5.1	100	ELXV800E□□8R2MEB5D
	18	6.3×11.5	1.1	3.0	150	ELXV800E□□180MFB5D

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz) 20℃	Impedance (Ωmax/100kHz) -10℃	Rated ripple current (mArms/105℃, 100kHz)	Part No.
80	27	6.3×15	0.62	1.7	220	ELXV800E□□270MF15D
	33	8×12	0.53	1.5	275	ELXV800E□□330MH12D
	39	10×12.5	0.47	1.3	380	ELXV800E□□390MJC5S
	47	8×15	0.35	0.97	360	ELXV800E□□470MH15D
	56	8×20	0.27	0.74	490	ELXV800E□□560MH20D
	56	10×16	0.33	0.90	500	ELXV800E□□560MJ16S
	82	10×20	0.26	0.70	620	ELXV800E□□820MJ20S
	100	10×25	0.19	0.52	795	ELXV800E□□101MJ25S
	150	10×30	0.15	0.41	955	ELXV800E□□151MJ30S
	150	12.5×20	0.15	0.41	890	ELXV800E□□151MK20S
	180	12.5×25	0.11	0.30	1,040	ELXV800E□□181MK25S
	270	12.5×30	0.094	0.26	1,270	ELXV800E□□271MK30S
	270	16×20	0.11	0.30	1,240	ELXV800E□□271ML20S
	330	12.5×35	0.087	0.24	1,450	ELXV800E□□331MK35S
	330	16×25	0.081	0.22	1,440	ELXV800E□□331ML25S
	390	12.5×40	0.060	0.17	1,610	ELXV800E□□391MK40S
	390	18×20	0.085	0.23	1,450	ELXV800E□□391MM20S
	470	16×30	0.058	0.16	1,790	ELXV800E□□471ML30S
	470	18×25	0.070	0.19	1,650	ELXV800E□□471MM25S
	560	16×35	0.052	0.14	2,000	ELXV800E□□561ML35S
	680	16×40	0.041	0.11	2,200	ELXV800E□□681ML40S
	680	18×30	0.058	0.16	1,850	ELXV800E□□681MM30S
	820	18×35	0.052	0.14	1,990	ELXV800E□□821MM35S
	1,000	18×40	0.041	0.11	2,370	ELXV800E□□102MM40S
100	5.6	5×11.5	1.9	5.1	100	ELXV101E□□5R6MEB5D
	12	6.3×11.5	1.1	3.0	150	ELXV101E□□120MFB5D
	18	6.3×15	0.62	1.7	220	ELXV101E□□180MF15D
	22	8×12	0.53	1.5	275	ELXV101E□□220MH12D
	27	10×12.5	0.47	1.3	380	ELXV101E□□270MJC5S
	33	8×15	0.35	0.97	360	ELXV101E□□330MH15D
	33	10×16	0.33	0.90	500	ELXV101E□□330MJ16S
	39	8×20	0.27	0.74	490	ELXV101E□□390MH20D
	56	10×20	0.26	0.70	620	ELXV101E□□560MJ20S
	68	10×25	0.19	0.52	795	ELXV101E□□680MJ25S
	100	10×30	0.15	0.41	955	ELXV101E□□101MJ30S
	100	12.5×20	0.15	0.41	890	ELXV101E□□101MK20S
	120	12.5×25	0.11	0.30	1,040	ELXV101E□□121MK25S
	180	12.5×30	0.094	0.26	1,270	ELXV101E□□181MK30S
	180	16×20	0.11	0.30	1,240	ELXV101E□□181ML20S
	220	12.5×35	0.087	0.24	1,450	ELXV101E□□221MK35S
	220	16×25	0.081	0.22	1,440	ELXV101E□□221ML25S
	270	12.5×40	0.060	0.17	1,610	ELXV101E□□271MK40S
	270	18×20	0.085	0.23	1,450	ELXV101E□□271MM20S
	330	16×30	0.058	0.16	1,790	ELXV101E□□331ML30S
	330	18×25	0.070	0.19	1,650	ELXV101E□□331MM25S
	390	16×35	0.052	0.14	2,000	ELXV101E□□391ML35S
	390	18×30	0.058	0.16	1,850	ELXV101E□□391MM30S
	470	16×40	0.041	0.11	2,200	ELXV101E□□471ML40S
	560	18×35	0.052	0.14	1,990	ELXV101E□□561MM35S
	680	18×40	0.041	0.11	2,370	ELXV101E□□681MM40S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Rated voltage (Vdc)	Case size φD (mm)	Frequency (Hz) 120	1k	10k	100k	Rated voltage (Vdc)	Case size φD (mm)	Frequency (Hz) 120	1k	10k	100k
6.3 & 10	5 to 8	0.65	0.83	0.95	1.00	35 & 50	5 to 8	0.40	0.66	0.85	1.00
	10 & 12.5	0.70	0.85	0.96	1.00		10 & 12.5	0.50	0.73	0.89	1.00
	16 & 18	0.85	0.92	0.97	1.00		16 & 18	0.60	0.81	0.94	1.00
16 & 25	5 to 8	0.55	0.76	0.91	1.00	63 to 100	5 to 8	0.20	0.55	0.80	1.00
	10 & 12.5	0.65	0.83	0.93	1.00		10 & 12.5	0.35	0.65	0.85	1.00
	16 & 18	0.70	0.87	0.96	1.00		16 & 18	0.50	0.75	0.90	1.00

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

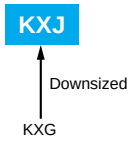
MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

160 to 450Vdc long life, 105℃

Upgrade!

KXJ Series

- Downsized and Longer life from current KXG series
- Endurance with ripple current : 10,000 to 12,000 hours at 105℃
- Rated voltage range : 160 to 450V, Capacitance range : 6.8 to 680μF
- For electronic ballast circuits and other long life required applications
- Non solvent-proof type
- **RoHS Compliant**

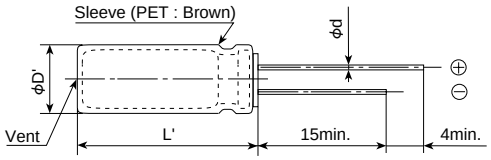


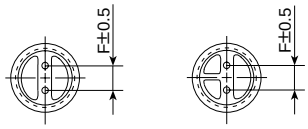
◆SPECIFICATIONS

Items	Characteristics				
Category Temperature Range	−40 to +105℃ (160 to 400Vdc) -25 to +105℃ (420, 450Vdc)				
Rated Voltage Range	160 to 450Vdc				
Capacitance Tolerance	±20% (M)				(at 20℃, 120Hz)
Leakage Current		After 1 minute	After 5 minutes		
	CV≦1000	I=0.1CV+40	I=0.03CV+15		
	CV>1000	I=0.04CV+100	I=0.02CV+25		
	Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)				(at 20℃)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 250V	350 to 450V		
	tanδ (Max.)	0.20	0.24		(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 250V	350, 400V	420, 450V	
	Z(−25℃)/Z(+20℃)	3	5	6	
	Z(−40℃)/Z(+20℃)	6	6	—	(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 12,000 hours (10,000 hours for 20L max.) 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 1000 hours at 105℃ without voltage applied.				
	Capacitance change	≦±20% of the initial value			
	D.F. (tanδ)	≦200% of the initial specified value			
	Leakage current	≦500% of the initial specified value			

◆DIMENSIONS [mm]

- Terminal Code : E

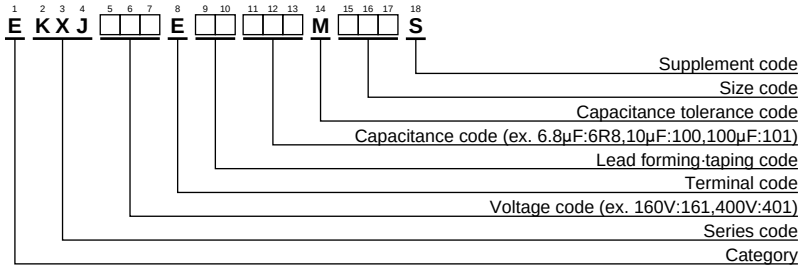




Gas escaped end seal

φD	10	12.5	14.5	16	18
φd	0.6	0.6	0.8	0.8	0.8
F	5.0	5.0	7.5	7.5	7.5
φD'	φD+0.5max.				
L'	L+1.5max.				

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

◆RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

Frequency (Hz)	120	1k	10k	100k
Less than 100μF	1.00	1.75	2.25	2.50
100μF or more	1.00	1.67	2.05	2.25

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

160 to 450Vdc long life, 105℃

Upgrade!

KXJ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
160	39	10×16	0.20	245	EKXJ161E□□390MJ16S
	56	10×20	0.20	315	EKXJ161E□□560MJ20S
	82	10×25	0.20	415	EKXJ161E□□820MJ25S
	82	10×30	0.20	445	EKXJ161E□□820MJ30S
	100	12.5×20	0.20	575	EKXJ161E□□101MK20S
	120	10×35	0.20	570	EKXJ161E□□121MJ35S
	120	14.5×20	0.20	675	EKXJ161E□□121MU20S
	150	10×40	0.20	665	EKXJ161E□□151MJ40S
	150	10×45	0.20	695	EKXJ161E□□151MJ45S
	150	12.5×25	0.20	765	EKXJ161E□□151MK25S
	180	10×50	0.20	785	EKXJ161E□□181MJ50S
	180	12.5×30	0.20	885	EKXJ161E□□181MK30S
	180	14.5×25	0.20	890	EKXJ161E□□181MU25S
	180	16×20	0.20	855	EKXJ161E□□181ML20S
	220	12.5×35	0.20	1,040	EKXJ161E□□221MK35S
	220	16×25	0.20	1,020	EKXJ161E□□221ML25S
	220	18×20	0.20	990	EKXJ161E□□221MM20S
	270	12.5×40	0.20	1,190	EKXJ161E□□271MK40S
	270	12.5×45	0.20	1,230	EKXJ161E□□271MK45S
	270	14.5×31.5	0.20	1,170	EKXJ161E□□271MUN3S
	270	14.5×35.5	0.20	1,210	EKXJ161E□□271MUP1S
	330	12.5×50	0.20	1,400	EKXJ161E□□331MK50S
	330	14.5×40	0.20	1,385	EKXJ161E□□331MU40S
	330	16×31.5	0.20	1,350	EKXJ161E□□331MLN3S
	330	18×25	0.20	1,290	EKXJ161E□□331MM25S
	390	14.5×45	0.20	1,545	EKXJ161E□□391MU45S
	390	16×35.5	0.20	1,500	EKXJ161E□□391MLP1S
	470	14.5×50	0.20	1,735	EKXJ161E□□471MU50S
	470	16×40	0.20	1,700	EKXJ161E□□471ML40S
	470	16×45	0.20	1,730	EKXJ161E□□471ML45S
	470	18×31.5	0.20	1,660	EKXJ161E□□471MMN3S
	470	18×35.5	0.20	1,715	EKXJ161E□□471MMP1S
	560	16×50	0.20	1,920	EKXJ161E□□561ML50S
	560	18×40	0.20	1,905	EKXJ161E□□561MM40S
	680	18×45	0.20	2,130	EKXJ161E□□681MM45S
	680	18×50	0.20	2,145	EKXJ161E□□681MM50S
200	27	10×16	0.20	200	EKXJ201E□□270MJ16S
	47	10×20	0.20	290	EKXJ201E□□470MJ20S
	56	10×25	0.20	345	EKXJ201E□□560MJ25S
	68	10×30	0.20	405	EKXJ201E□□680MJ30S
	82	12.5×20	0.20	520	EKXJ201E□□820MK20S
	100	10×35	0.20	520	EKXJ201E□□101MJ35S
	100	12.5×25	0.20	625	EKXJ201E□□101MK25S
	100	14.5×20	0.20	615	EKXJ201E□□101MU20S
	120	10×40	0.20	595	EKXJ201E□□121MJ40S
	120	10×45	0.20	620	EKXJ201E□□121MJ45S
	120	12.5×30	0.20	725	EKXJ201E□□121MK30S
	120	16×20	0.20	695	EKXJ201E□□121ML20S
	150	10×50	0.20	720	EKXJ201E□□151MJ50S
	150	12.5×35	0.20	860	EKXJ201E□□151MK35S
	150	14.5×25	0.20	810	EKXJ201E□□151MU25S
	180	14.5×31.5	0.20	955	EKXJ201E□□181MUN3S
	180	16×25	0.20	925	EKXJ201E□□181ML25S
	180	18×20	0.20	895	EKXJ201E□□181MM20S
	220	12.5×40	0.20	1,075	EKXJ201E□□221MK40S
	220	12.5×45	0.20	1,110	EKXJ201E□□221MK45S
	220	14.5×35.5	0.20	1,095	EKXJ201E□□221MUP1S
	220	18×25	0.20	1,050	EKXJ201E□□221MM25S
	270	12.5×50	0.20	1,265	EKXJ201E□□271MK50S
	270	14.5×40	0.20	1,250	EKXJ201E□□271MU40S
	270	14.5×45	0.20	1,290	EKXJ201E□□271MU45S
	270	16×31.5	0.20	1,220	EKXJ201E□□271MLN3S
	270	16×35.5	0.20	1,250	EKXJ201E□□271MLP1S
	330	14.5×50	0.20	1,450	EKXJ201E□□331MU50S
	330	16×40	0.20	1,425	EKXJ201E□□331ML40S
	330	18×31.5	0.20	1,395	EKXJ201E□□331MMN3S
	390	16×45	0.20	1,575	EKXJ201E□□391ML45S
	390	18×35.5	0.20	1,565	EKXJ201E□□391MMP1S
	470	16×50	0.20	1,755	EKXJ201E□□471ML50S
	470	18×40	0.20	1,745	EKXJ201E□□471MM40S
	470	18×45	0.20	1,770	EKXJ201E□□471MM45S
	560	18×50	0.20	1,945	EKXJ201E□□561MM50S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
220	27	10×16	0.20	200	EKXJ221E□□270MJ16S
	39	10×20	0.20	265	EKXJ221E□□390MJ20S
	56	10×25	0.20	345	EKXJ221E□□560MJ25S
	56	10×30	0.20	370	EKXJ221E□□560MJ30S
	68	12.5×20	0.20	475	EKXJ221E□□680MK20S
	82	10×35	0.20	470	EKXJ221E□□820MJ35S
	82	14.5×20	0.20	555	EKXJ221E□□820MU20S
	100	10×40	0.20	545	EKXJ221E□□101MJ40S
	100	10×45	0.20	565	EKXJ221E□□101MJ45S
	100	12.5×25	0.20	625	EKXJ221E□□101MK25S
	120	10×50	0.20	645	EKXJ221E□□121MJ50S
	120	12.5×30	0.20	725	EKXJ221E□□121MK30S
	120	14.5×25	0.20	725	EKXJ221E□□121MU25S
	120	16×20	0.20	695	EKXJ221E□□121ML20S
	150	12.5×35	0.20	860	EKXJ221E□□151MK35S
	150	16×25	0.20	845	EKXJ221E□□151ML25S
	150	18×20	0.20	815	EKXJ221E□□151MM20S
	180	12.5×40	0.20	975	EKXJ221E□□181MK40S
	180	12.5×45	0.20	1,005	EKXJ221E□□181MK45S
	180	14.5×31.5	0.20	955	EKXJ221E□□181MUN3S
	220	12.5×50	0.20	1,145	EKXJ221E□□221MK50S
	220	14.5×35.5	0.20	1,095	EKXJ221E□□221MUP1S
	220	14.5×40	0.20	1,130	EKXJ221E□□221MU40S
	220	16×31.5	0.20	1,100	EKXJ221E□□221MLN3S
	220	18×25	0.20	1,050	EKXJ221E□□221MM25S
	270	14.5×45	0.20	1,285	EKXJ221E□□271MU45S
	270	14.5×50	0.20	1,315	EKXJ221E□□271MU50S
	270	16×35.5	0.20	1,245	EKXJ221E□□271MLP1S
	270	18×31.5	0.20	1,260	EKXJ221E□□271MMN3S
	330	16×40	0.20	1,425	EKXJ221E□□331ML40S
	330	16×45	0.20	1,450	EKXJ221E□□331ML45S
	330	18×35.5	0.20	1,440	EKXJ221E□□331MMP1S
	390	16×50	0.20	1,600	EKXJ221E□□391ML50S
	390	18×40	0.20	1,590	EKXJ221E□□391MM40S
	390	18×45	0.20	1,620	EKXJ221E□□391MM45S
	470	18×50	0.20	1,785	EKXJ221E□□471MM50S
250	22	10×16	0.20	185	EKXJ251E□□220MJ16S
	33	10×20	0.20	240	EKXJ251E□□330MJ20S
	47	10×25	0.20	315	EKXJ251E□□470MJ25S
	47	10×30	0.20	340	EKXJ251E□□470MJ30S
	56	12.5×20	0.20	430	EKXJ251E□□560MK20S
	68	10×35	0.20	430	EKXJ251E□□680MJ35S
	68	14.5×20	0.20	505	EKXJ251E□□680MU20S
	82	10×40	0.20	495	EKXJ251E□□820MJ40S
	82	10×45	0.20	515	EKXJ251E□□820MJ45S
	82	12.5×25	0.20	565	EKXJ251E□□820MK25S
	100	10×50	0.20	585	EKXJ251E□□101MJ50S
	100	12.5×30	0.20	660	EKXJ251E□□101MK30S
	100	14.5×25	0.20	665	EKXJ251E□□101MU25S
	100	16×20	0.20	635	EKXJ251E□□101ML20S
	120	12.5×35	0.20	770	EKXJ251E□□121MK35S
	120	16×25	0.20	755	EKXJ251E□□121ML25S
	120	18×20	0.20	730	EKXJ251E□□121MM20S
	150	12.5×40	0.20	890	EKXJ251E□□151MK40S
	150	12.5×45	0.20	920	EKXJ251E□□151MK45S
	150	14.5×31.5	0.20	870	EKXJ251E□□151MUN3S
	180	12.5×50	0.20	1,035	EKXJ251E□□181MK50S
	180	14.5×35.5	0.20	990	EKXJ251E□□181MUP1S
	180	14.5×40	0.20	1,020	EKXJ251E□□181MU40S
	180	16×31.5	0.20	995	EKXJ251E□□181MLN3S
	180	18×25	0.20	950	EKXJ251E□□181MM25S
	220	14.5×45	0.20	1,160	EKXJ251E□□221MU45S
	220	14.5×50	0.20	1,185	EKXJ251E□□221MU50S
	220	16×35.5	0.20	1,125	EKXJ251E□□221MLP1S
	220	18×31.5	0.20	1,135	EKXJ251E□□221MMN3S
	270	16×40	0.20	1,285	EKXJ251E□□271ML40S
	270	16×45	0.20	1,310	EKXJ251E□□271ML45S
	270	18×35.5	0.20	1,300	EKXJ251E□□271MMP1S
	330	16×50	0.20	1,475	EKXJ251E□□331ML50S
	330	18×40	0.20	1,460	EKXJ251E□□331MM40S
	330	18×45	0.20	1,485	EKXJ251E□□331MM45S
	390	18×50	0.20	1,625	EKXJ251E□□391MM50S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

160 to 450Vdc long life, 105℃

Upgrade!

KXJ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
350	12	10×16	0.24	135	EKXJ351E□□120MJ16S
	22	10×20	0.24	200	EKXJ351E□□220MJ20S
	27	10×25	0.24	240	EKXJ351E□□270MJ25S
	27	10×30	0.24	255	EKXJ351E□□270MJ30S
	33	12.5×20	0.24	330	EKXJ351E□□330MK20S
	39	10×35	0.24	325	EKXJ351E□□390MJ35S
	47	10×40	0.24	375	EKXJ351E□□470MJ40S
	47	12.5×25	0.24	425	EKXJ351E□□470MK25S
	47	14.5×20	0.24	420	EKXJ351E□□470MU20S
	56	10×45	0.24	425	EKXJ351E□□560MJ45S
	56	12.5×30	0.24	495	EKXJ351E□□560MK30S
	56	16×20	0.24	475	EKXJ351E□□560ML20S
	68	10×50	0.24	485	EKXJ351E□□680MJ50S
	68	12.5×35	0.24	580	EKXJ351E□□680MK35S
	68	14.5×25	0.24	545	EKXJ351E□□680MU25S
	68	18×20	0.24	550	EKXJ351E□□680MM20S
	82	12.5×40	0.24	655	EKXJ351E□□820MK40S
	82	14.5×31.5	0.24	645	EKXJ351E□□820MUN3S
	82	16×25	0.24	625	EKXJ351E□□820ML25S
	100	12.5×45	0.24	750	EKXJ351E□□101MK45S
	100	12.5×50	0.24	770	EKXJ351E□□101MK50S
	100	14.5×35.5	0.24	740	EKXJ351E□□101MUP1S
	100	16×31.5	0.24	740	EKXJ351E□□101MLN3S
	100	18×25	0.24	710	EKXJ351E□□101MM25S
	120	14.5×40	0.24	835	EKXJ351E□□121MU40S
	120	14.5×45	0.24	860	EKXJ351E□□121MU45S
	120	16×35.5	0.24	830	EKXJ351E□□121MLP1S
	150	14.5×50	0.24	980	EKXJ351E□□151MU50S
	150	16×40	0.24	960	EKXJ351E□□151ML40S
	150	16×45	0.24	975	EKXJ351E□□151ML45S
	150	18×31.5	0.24	940	EKXJ351E□□151MMN3S
	180	16×50	0.24	1,090	EKXJ351E□□181ML50S
	180	18×35.5	0.24	1,065	EKXJ351E□□181MMP1S
	180	18×40	0.24	1,080	EKXJ351E□□181MM40S
	220	18×45	0.24	1,210	EKXJ351E□□221MM45S
	220	18×50	0.24	1,220	EKXJ351E□□221MM50S
400	10	10×16	0.24	125	EKXJ401E□□100MJ16S
	18	10×20	0.24	180	EKXJ401E□□180MJ20S
	22	10×25	0.24	215	EKXJ401E□□220MJ25S
	27	10×30	0.24	255	EKXJ401E□□270MJ30S
	27	12.5×20	0.24	300	EKXJ401E□□270MK20S
	33	10×35	0.24	300	EKXJ401E□□330MJ35S
	39	10×40	0.24	340	EKXJ401E□□390MJ40S
	39	10×45	0.24	355	EKXJ401E□□390MJ45S
	39	12.5×25	0.24	390	EKXJ401E□□390MK25S
	39	14.5×20	0.24	385	EKXJ401E□□390MU20S
	47	12.5×30	0.24	455	EKXJ401E□□470MK30S
	47	16×20	0.24	435	EKXJ401E□□470ML20S
	56	10×50	0.24	440	EKXJ401E□□560MJ50S
	56	12.5×35	0.24	525	EKXJ401E□□560MK35S
	56	14.5×25	0.24	495	EKXJ401E□□560MU25S
	56	18×20	0.24	500	EKXJ401E□□560MM20S
	68	12.5×40	0.24	600	EKXJ401E□□680MK40S
	68	14.5×31.5	0.24	585	EKXJ401E□□680MUN3S
	68	16×25	0.24	570	EKXJ401E□□680ML25S
	82	12.5×45	0.24	680	EKXJ401E□□820MK45S
	82	12.5×50	0.24	700	EKXJ401E□□820MK50S
	82	14.5×35.5	0.24	670	EKXJ401E□□820MUP1S
	82	16×31.5	0.24	670	EKXJ401E□□820MLN3S
	82	18×25	0.24	640	EKXJ401E□□820MM25S
	100	14.5×40	0.24	760	EKXJ401E□□101MU40S
	100	14.5×45	0.24	785	EKXJ401E□□101MU45S
	100	16×35.5	0.24	760	EKXJ401E□□101MLP1S
	120	14.5×50	0.24	875	EKXJ401E□□121MU50S
	120	16×40	0.24	860	EKXJ401E□□121ML40S
	120	16×45	0.24	875	EKXJ401E□□121ML45S
	120	18×31.5	0.24	840	EKXJ401E□□121MMN3S
	120	18×35.5	0.24	870	EKXJ401E□□121MMP1S
	150	16×50	0.24	995	EKXJ401E□□151ML50S
	150	18×40	0.24	985	EKXJ401E□□151MM40S
	180	18×45	0.24	1,095	EKXJ401E□□181MM45S
	220	18×50	0.24	1,220	EKXJ401E□□221MM50S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
420	6.8	10×16	0.24	105	EKXJ421E□□6R8MJ16S
	12	10×20	0.24	150	EKXJ421E□□120MJ20S
	15	10×25	0.24	185	EKXJ421E□□150MJ25S
	18	10×30	0.24	215	EKXJ421E□□180MJ30S
	22	12.5×20	0.24	285	EKXJ421E□□220MK20S
	27	10×35	0.24	275	EKXJ421E□□270MJ35S
	27	10×40	0.24	290	EKXJ421E□□270MJ40S
	27	12.5×25	0.24	340	EKXJ421E□□270MK25S
	27	14.5×20	0.24	335	EKXJ421E□□270MU20S
	33	10×45	0.24	335	EKXJ421E□□330MJ45S
	33	12.5×30	0.24	400	EKXJ421E□□330MK30S
	33	16×20	0.24	385	EKXJ421E□□330ML20S
	39	10×50	0.24	375	EKXJ421E□□390MJ50S
	39	14.5×25	0.24	435	EKXJ421E□□390MU25S
	47	12.5×35	0.24	505	EKXJ421E□□470MK35S
	47	16×25	0.24	500	EKXJ421E□□470ML25S
	47	18×20	0.24	480	EKXJ421E□□470MM20S
	56	12.5×40	0.24	570	EKXJ421E□□560MK40S
	56	12.5×45	0.24	590	EKXJ421E□□560MK45S
	56	14.5×31.5	0.24	560	EKXJ421E□□560MUN3S
	68	12.5×50	0.24	670	EKXJ421E□□680MK50S
	68	14.5×35.5	0.24	640	EKXJ421E□□680MUP1S
	68	14.5×40	0.24	660	EKXJ421E□□680MU40S
	68	16×31.5	0.24	645	EKXJ421E□□680MLN3S
	68	18×25	0.24	615	EKXJ421E□□680MM25S
	82	14.5×45	0.24	750	EKXJ421E□□820MU45S
	82	16×35.5	0.24	725	EKXJ421E□□820MLP1S
	82	18×31.5	0.24	730	EKXJ421E□□820MMN3S
	100	14.5×50	0.24	845	EKXJ421E□□101MU50S
	100	16×40	0.24	825	EKXJ421E□□101ML40S
	100	16×45	0.24	840	EKXJ421E□□101ML45S
	100	18×35.5	0.24	835	EKXJ421E□□101MMP1S
	120	16×50	0.24	935	EKXJ421E□□121ML50S
	120	18×40	0.24	930	EKXJ421E□□121MM40S
	120	18×45	0.24	945	EKXJ421E□□121MM45S
	150	18×50	0.24	1,060	EKXJ421E□□151MM50S
450	6.8	10×16	0.24	105	EKXJ451E□□6R8MJ16S
	12	10×20	0.24	150	EKXJ451E□□120MJ20S
	15	10×25	0.24	185	EKXJ451E□□150MJ25S
	18	10×30	0.24	215	EKXJ451E□□180MJ30S
	18	12.5×20	0.24	255	EKXJ451E□□180MK20S
	22	10×35	0.24	250	EKXJ451E□□220MJ35S
	27	10×40	0.24	290	EKXJ451E□□270MJ40S
	27	10×45	0.24	305	EKXJ451E□□270MJ45S
	27	12.5×25	0.24	340	EKXJ451E□□270MK25S
	27	14.5×20	0.24	335	EKXJ451E□□270MU20S
	33	12.5×30	0.24	400	EKXJ451E□□330MK30S
	33	14.5×25	0.24	400	EKXJ451E□□330MU25S
	33	16×20	0.24	385	EKXJ451E□□330ML20S
	39	10×50	0.24	375	EKXJ451E□□390MJ50S
	39	12.5×35	0.24	460	EKXJ451E□□390MK35S
	39	18×20	0.24	440	EKXJ451E□□390MM20S
	47	12.5×40	0.24	525	EKXJ451E□□470MK40S
	47	14.5×31.5	0.24	515	EKXJ451E□□470MUN3S
	47	16×25	0.24	500	EKXJ451E□□470ML25S
	56	12.5×45	0.24	590	EKXJ451E□□560MK45S
	56	14.5×35.5	0.24	580	EKXJ451E□□560MUP1S
	56	16×31.5	0.24	585	EKXJ451E□□560MLN3S
	56	18×25	0.24	560	EKXJ451E□□560MM25S
	68	12.5×50	0.24	670	EKXJ451E□□680MK50S
	68	14.5×40	0.24	660	EKXJ451E□□680MU40S
	68	14.5×45	0.24	680	EKXJ451E□□680MU45S
	68	16×35.5	0.24	660	EKXJ451E□□680MLP1S
	82	14.5×50	0.24	765	EKXJ451E□□820MU50S
	82	16×40	0.24	750	EKXJ451E□□820ML40S
	82	16×45	0.24	760	EKXJ451E□□820ML45S
	82	18×31.5	0.24	730	EKXJ451E□□820MMN3S
	100	16×50	0.24	855	EKXJ451E□□101ML50S
	100	18×35.5	0.24	835	EKXJ451E□□101MMP1S
	120	18×40	0.24	930	EKXJ451E□□121MM40S
	120	18×45	0.24	945	EKXJ451E□□121MM45S
	150	18×50	0.24	1,060	EKXJ451E□□151MM50S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

160 to 450Vdc long life, 105℃

KXG Series

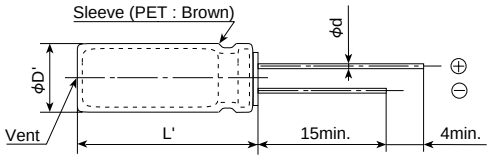
- Downsized from current KMX series
- For electronic ballast circuits and other long life required applications
- Endurance with ripple current : 8,000 to 10,000hours at 105℃
- Non solvent-proof type
- **RoHS Compliant**

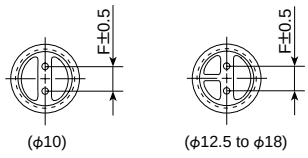
◆SPECIFICATIONS

Items	Characteristics				
Category Temperature Range	−40 to +105℃ (160 to 400Vdc) −25 to+105℃ (450Vdc)				
Rated Voltage Range	160 to 450Vdc				
Capacitance Tolerance	±20% (M)				(at 20℃, 120Hz)
Leakage Current		After 1 minute	After 5 minutes		
	CV≦1,000	I=0.1CV+40	I=0.03CV+15		
	CV>1,000	I=0.04CV+100	I=0.02CV+25		
	Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)				(at 20℃)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 250V	350 to 450V		
	tanδ (Max.)	0.20	0.24		(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 250V	350 & 400V	450V	
	Z(−25℃)/Z(+20℃)	3	5	6	
	Z(−40℃)/Z(+20℃)	6	6	—	(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 10,000 hours (8,000 hours for φ10) 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	≦500% of the initial specified value			

◆DIMENSIONS [mm]

- Terminal Code : E

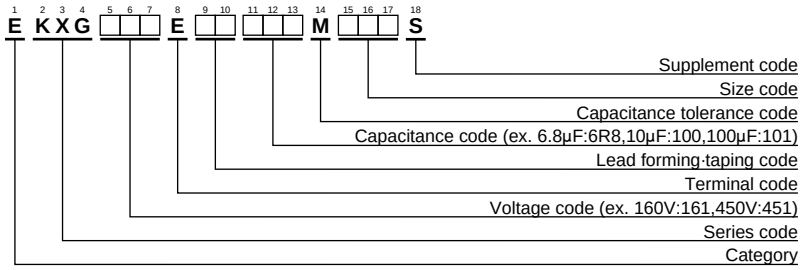




Gas escape end seal

φD	10	12.5	16	18
φd	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5
φD'	φD+0.5max.			
L'	L+1.5max.			

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

◆RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
6.8 to 82	1.00	1.75	2.25	2.50
100 to 330	1.00	1.67	2.05	2.25

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

160 to 450Vdc long life, 105℃

KXG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current(mArms/105℃)		Part No.
				120Hz	100kHz	
160	10	10×16	0.20	125	315	EKXG161E□□100MJ16S
	22	10×20	0.20	200	500	EKXG161E□□220MJ20S
	33	10×20	0.20	250	625	EKXG161E□□330MJ20S
	47	10×20	0.20	300	750	EKXG161E□□470MJ20S
	68	12.5×20	0.20	470	1,175	EKXG161E□□680MK20S
	82	12.5×20	0.20	510	1,275	EKXG161E□□820MK20S
	100	12.5×25	0.20	620	1,395	EKXG161E□□101MK25S
	100	16×20	0.20	630	1,420	EKXG161E□□101ML20S
	150	16×20	0.20	770	1,735	EKXG161E□□151ML20S
	220	16×25	0.20	1,020	2,295	EKXG161E□□221ML25S
	330	18×31.5	0.20	1,390	3,130	EKXG161E□□331MMN3S
200	10	10×16	0.20	125	315	EKXG201E□□100MJ16S
	22	10×20	0.20	200	500	EKXG201E□□220MJ20S
	33	10×20	0.20	260	650	EKXG201E□□330MJ20S
	47	12.5×20	0.20	390	975	EKXG201E□□470MK20S
	68	12.5×20	0.20	470	1,175	EKXG201E□□680MK20S
	82	16×20	0.20	550	1,375	EKXG201E□□820ML20S
	100	16×20	0.20	630	1,420	EKXG201E□□101ML20S
	150	16×25	0.20	840	1,890	EKXG201E□□151ML25S
	220	18×25	0.20	1,050	2,365	EKXG201E□□221MM25S
	330	18×35.5	0.20	1,430	3,220	EKXG201E□□331MMP1S
250	10	10×20	0.20	140	350	EKXG251E□□100MJ20S
	22	10×20	0.20	200	500	EKXG251E□□220MJ20S
	33	12.5×20	0.20	320	800	EKXG251E□□330MK20S
	47	12.5×20	0.20	390	975	EKXG251E□□470MK20S
	68	16×20	0.20	520	1,300	EKXG251E□□680ML20S
	82	16×20	0.20	550	1,375	EKXG251E□□820ML20S
	100	16×25	0.20	680	1,530	EKXG251E□□101ML25S
	150	18×25	0.20	860	1,935	EKXG251E□□151MM25S
	220	18×31.5	0.20	1,130	2,545	EKXG251E□□221MMN3S
350	6.8	10×16	0.24	110	275	EKXG351E□□6R8MJ16S
	10	10×20	0.24	140	350	EKXG351E□□100MJ20S
	22	12.5×20	0.24	260	650	EKXG351E□□220MK20S
	33	16×20	0.24	360	900	EKXG351E□□330ML20S
	47	16×20	0.24	430	1,075	EKXG351E□□470ML20S
	68	16×25	0.24	560	1,400	EKXG351E□□680ML25S
	68	18×20	0.24	550	1,375	EKXG351E□□680MM20S
	82	18×25	0.24	610	1,525	EKXG351E□□820MM25S
	100	18×25	0.24	700	1,575	EKXG351E□□101MM25S
	120	18×31.5	0.24	830	1,865	EKXG351E□□121MMN3S
	150	18×35.5	0.24	960	2,160	EKXG351E□□151MMP1S
400	6.8	10×16	0.24	110	275	EKXG401E□□6R8MJ16S
	10	10×20	0.24	140	350	EKXG401E□□100MJ20S
	15	12.5×20	0.24	220	550	EKXG401E□□150MK20S
	22	12.5×20	0.24	260	650	EKXG401E□□220MK20S
	33	16×20	0.24	360	900	EKXG401E□□330ML20S
	47	16×25	0.24	470	1,175	EKXG401E□□470ML25S
	47	18×20	0.24	450	1,125	EKXG401E□□470MM20S
	68	18×25	0.24	585	1,465	EKXG401E□□680MM25S
	82	18×25	0.24	610	1,525	EKXG401E□□820MM25S
	100	18×31.5	0.24	765	1,720	EKXG401E□□101MMN3S
	120	18×35.5	0.24	865	1,945	EKXG401E□□121MMP1S
	150	18×40	0.24	985	2,215	EKXG401E□□151MM40S
450	6.8	10×20	0.24	110	275	EKXG451E□□6R8MJ20S
	10	12.5×20	0.24	180	450	EKXG451E□□100MK20S
	15	12.5×25	0.24	240	600	EKXG451E□□150MK25S
	22	16×20	0.24	290	725	EKXG451E□□220ML20S
	33	16×25	0.24	390	975	EKXG451E□□330ML25S
	33	18×20	0.24	380	950	EKXG451E□□330MM20S
	47	18×25	0.24	480	1,200	EKXG451E□□470MM25S
	68	18×31.5	0.24	630	1,575	EKXG451E□□680MMN3S
	82	18×35.5	0.24	715	1,785	EKXG451E□□820MMP1S
	100	18×40	0.24	800	1,800	EKXG451E□□101MM40S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

φ20 & 22 radial lead, 85℃

SMH Series

- Downsized from current standard SMG series
- Endurance with ripple current : 2,000 hours at 85℃
- For input filtering of power supplies
- Non solvent-proof type
- **RoHS Compliant**

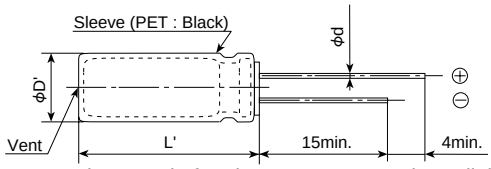
SMH
↑ Downsized
Higher ripple
Low profile
SMG

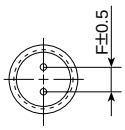
◆SPECIFICATIONS

Items	Characteristics		
Category Temperature Range	−25 to +85℃		
Rated Voltage Range	160 to 450Vdc		
Capacitance Tolerance	±20% (M)		(at 20℃, 120Hz)
Leakage Current	I=0.03CV or 3 mA, 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 (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 250V	400 & 450V
	Z(−25℃)/Z(+20℃)	4	6
			(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 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 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	≦500% of the initial specified value	

◆DIMENSIONS [mm]

●Terminal Code : E

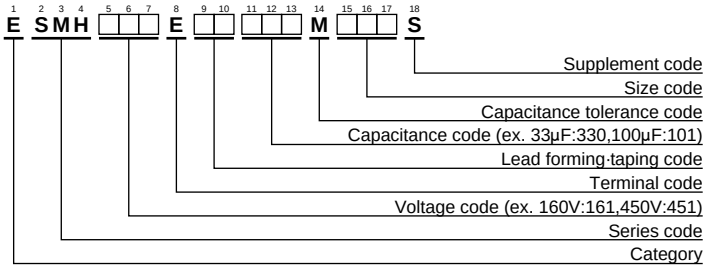




φD	20	22
φd	1.0	
F	10.0	
φD'	φD+0.5max.	
L'	L+2.0max.	

*Note : The snap-in forming type, RC-type, is available upon request, RC-type fits two φ2mm holes and 10.5mm spacing.

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

ϕ20 & 22 radial lead, 85℃

SMH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size ϕD×L(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
160	180	20×20	0.15	900	ESMH161E□□181MN20S
	180	22×20	0.15	950	ESMH161E□□181MP20S
	220	20×25	0.15	1,070	ESMH161E□□221MN25S
	220	22×25	0.15	1,160	ESMH161E□□221MP25S
	270	20×30	0.15	1,290	ESMH161E□□271MN30S
	270	22×25	0.15	1,290	ESMH161E□□271MP25S
	330	20×30	0.15	1,430	ESMH161E□□331MN30S
	330	22×30	0.15	1,530	ESMH161E□□331MP30S
	390	20×30	0.15	1,550	ESMH161E□□391MN30S
	390	22×30	0.15	1,670	ESMH161E□□391MP30S
	470	20×35	0.15	1,780	ESMH161E□□471MN35S
	470	22×30	0.15	1,830	ESMH161E□□471MP30S
200	150	20×20	0.15	820	ESMH201E□□151MN20S
	150	22×20	0.15	870	ESMH201E□□151MP20S
	180	20×25	0.15	970	ESMH201E□□181MN25S
	180	22×25	0.15	1,050	ESMH201E□□181MP25S
	220	20×25	0.15	1,070	ESMH201E□□221MN25S
	220	22×25	0.15	1,160	ESMH201E□□221MP25S
	270	20×30	0.15	1,290	ESMH201E□□271MN30S
	270	22×30	0.15	1,390	ESMH201E□□271MP30S
	330	20×35	0.15	1,490	ESMH201E□□331MN35S
	330	22×30	0.15	1,530	ESMH201E□□331MP30S
	390	20×35	0.15	1,620	ESMH201E□□391MN35S
	390	22×30	0.15	1,670	ESMH201E□□391MP30S
	470	20×40	0.15	1,900	ESMH201E□□471MN40S
	470	22×35	0.15	1,920	ESMH201E□□471MP35S
250	100	20×20	0.15	670	ESMH251E□□101MN20S
	120	20×25	0.15	850	ESMH251E□□121MN25S
	120	22×20	0.15	830	ESMH251E□□121MP20S
	150	20×25	0.15	940	ESMH251E□□151MN25S
	150	22×25	0.15	1,030	ESMH251E□□151MP25S
	180	20×30	0.15	1,120	ESMH251E□□181MN30S
	180	22×25	0.15	1,120	ESMH251E□□181MP25S
	220	20×30	0.15	1,240	ESMH251E□□221MN30S
	220	22×30	0.15	1,330	ESMH251E□□221MP30S
	270	20×35	0.15	1,440	ESMH251E□□271MN35S
	270	22×30	0.15	1,470	ESMH251E□□271MP30S
	330	20×40	0.15	1,700	ESMH251E□□331MN40S

WV (Vdc)	Cap (μF)	Case size ϕD×L(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
250	330	22×35	0.15	1,710	ESMH251E□□331MP35S
	390	20×45	0.15	1,930	ESMH251E□□391MN45S
	390	22×40	0.15	2,000	ESMH251E□□391MP40S
	470	20×50	0.15	2,190	ESMH251E□□471MN50S
	470	22×45	0.15	2,290	ESMH251E□□471MP45S
400	47	20×20	0.15	480	ESMH401E□□470MN20S
	56	20×25	0.15	570	ESMH401E□□560MN25S
	56	22×25	0.15	620	ESMH401E□□560MP25S
	68	20×25	0.15	640	ESMH401E□□680MN25S
	68	22×25	0.15	690	ESMH401E□□680MP25S
	82	20×30	0.15	750	ESMH401E□□820MN30S
	82	22×25	0.15	780	ESMH401E□□820MP25S
	100	20×35	0.15	870	ESMH401E□□101MN35S
	100	22×30	0.15	900	ESMH401E□□101MP30S
	120	20×40	0.15	1,020	ESMH401E□□121MN40S
	120	22×35	0.15	1,030	ESMH401E□□121MP35S
	150	20×45	0.15	1,200	ESMH401E□□151MN45S
	150	22×40	0.15	1,240	ESMH401E□□151MP40S
	180	20×50	0.15	1,360	ESMH401E□□181MN50S
	180	22×45	0.15	1,410	ESMH401E□□181MP45S
	220	22×50	0.15	1,590	ESMH401E□□221MP50S
450	33	20×20	0.15	400	ESMH451E□□330MN20S
	47	20×25	0.15	520	ESMH451E□□470MN25S
	47	22×25	0.15	570	ESMH451E□□470MP25S
	56	20×30	0.15	620	ESMH451E□□560MN30S
	56	22×25	0.15	650	ESMH451E□□560MP25S
	68	20×35	0.15	720	ESMH451E□□680MN35S
	68	22×30	0.15	690	ESMH451E□□680MP30S
	82	20×35	0.15	790	ESMH451E□□820MN35S
	82	22×30	0.15	800	ESMH451E□□820MP30S
	100	20×40	0.15	920	ESMH451E□□101MN40S
	100	22×35	0.15	940	ESMH451E□□101MP35S
	120	20×45	0.15	1,070	ESMH451E□□121MN45S
	120	22×40	0.15	1,110	ESMH451E□□121MP40S
	150	20×50	0.15	1,240	ESMH451E□□151MN50S
	150	22×45	0.15	1,290	ESMH451E□□151MP45S
	180	22×50	0.15	1,440	ESMH451E□□181MP50S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency (Hz)	50	120	300	1k	10k	50k
160 to 250Vdc	0.81	1.00	1.17	1.32	1.45	1.50
400 & 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

ϕ20 & 22 radial lead, 105℃

KMH Series

- Radial lead type ranging from ϕ20×20 to ϕ22×50mm
- For input filtering of power supplies
- Endurance with ripple current : 2,000 hours at 105℃
- Non solvent-proof type
- **RoHS Compliant**

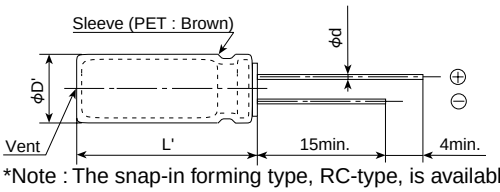
KMH
↑ Downsized, Higher ripple
KMG

◆SPECIFICATIONS

Items	Characteristics			
Category Temperature Range	−25 to +105℃			
Rated Voltage Range	160 to 450Vdc			
Capacitance Tolerance	±20% (M)			(at 20℃, 120Hz)
Leakage Current	I=0.03CV or 3 mA, 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 (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 250V	400 & 450V	
	Z(−25℃)/Z(+20℃)	4	6	(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 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 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	≦500% of the initial specified value		

◆DIMENSIONS [mm]

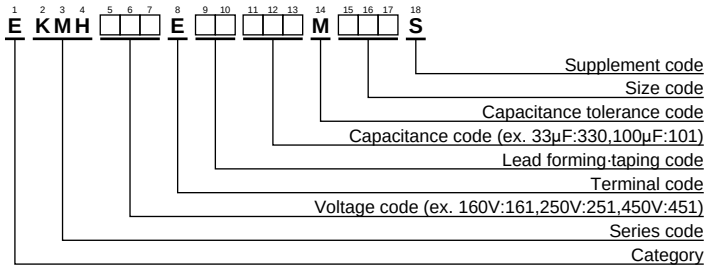
- Terminal Code : E



ϕD	20	22
ϕd	1.0	
F	10.0	
ϕD'	ϕD+0.5max.	
L'	L+2.0max.	

*Note : The snap-in forming type, RC-type, is available upon request, RC-type fits two ϕ2mm holes and 10.5mm spacing.

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

φ20 & 22 radial lead, 105℃

KMH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
160	150	20×20	0.15	580	EKMH161E□□151MN20S
	180	20×25	0.15	690	EKMH161E□□181MN25S
	180	22×20	0.15	680	EKMH161E□□181MP20S
	220	20×25	0.15	760	EKMH161E□□221MN25S
	220	22×25	0.15	820	EKMH161E□□221MP25S
	270	20×30	0.15	910	EKMH161E□□271MN30S
	270	22×25	0.15	910	EKMH161E□□271MP25S
	330	20×30	0.15	1,010	EKMH161E□□331MN30S
	330	22×30	0.15	1,160	EKMH161E□□331MP30S
	390	20×35	0.15	1,150	EKMH161E□□391MN35S
	390	22×30	0.15	1,270	EKMH161E□□391MP30S
	470	20×40	0.15	1,340	EKMH161E□□471MN40S
	470	22×35	0.15	1,400	EKMH161E□□471MP35S
200	120	20×20	0.15	520	EKMH201E□□121MN20S
	150	20×25	0.15	630	EKMH201E□□151MN25S
	150	22×20	0.15	620	EKMH201E□□151MP20S
	180	20×25	0.15	690	EKMH201E□□181MN25S
	180	22×25	0.15	750	EKMH201E□□181MP25S
	220	20×30	0.15	820	EKMH201E□□221MN30S
	220	22×25	0.15	820	EKMH201E□□221MP25S
	270	20×30	0.15	910	EKMH201E□□271MN30S
	270	22×30	0.15	980	EKMH201E□□271MP30S
	330	20×35	0.15	1,050	EKMH201E□□331MN35S
	330	22×35	0.15	1,200	EKMH201E□□331MP35S
	390	20×40	0.15	1,220	EKMH201E□□391MN40S
	390	22×35	0.15	1,310	EKMH201E□□391MP35S
	470	20×45	0.15	1,340	EKMH201E□□471MN45S
	470	22×40	0.15	1,450	EKMH201E□□471MP40S
250	82	20×20	0.15	460	EKMH251E□□820MN20S
	120	20×25	0.15	600	EKMH251E□□121MN25S
	120	22×20	0.15	590	EKMH251E□□121MP20S
	180	20×30	0.15	790	EKMH251E□□181MN30S
	180	22×25	0.15	790	EKMH251E□□181MP25S
	220	20×35	0.15	920	EKMH251E□□221MN35S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
250	220	22×30	0.15	950	EKMH251E□□221MP30S
	270	20×40	0.15	1,090	EKMH251E□□271MN40S
	270	22×35	0.15	1,140	EKMH251E□□271MP35S
	330	20×45	0.15	1,260	EKMH251E□□331MN45S
	330	22×40	0.15	1,300	EKMH251E□□331MP40S
	390	20×50	0.15	1,410	EKMH251E□□391MN50S
	390	22×45	0.15	1,490	EKMH251E□□391MP45S
	470	22×50	0.15	1,650	EKMH251E□□471MP50S
400	33	20×20	0.15	290	EKMH401E□□330MN20S
	47	22×20	0.15	370	EKMH401E□□470MP20S
	56	20×25	0.15	410	EKMH401E□□560MN25S
	68	20×30	0.15	490	EKMH401E□□680MN30S
	68	22×25	0.15	510	EKMH401E□□680MP25S
	100	20×35	0.15	620	EKMH401E□□101MN35S
	100	22×30	0.15	640	EKMH401E□□101MP30S
	120	20×40	0.15	720	EKMH401E□□121MN40S
	120	22×35	0.15	730	EKMH401E□□121MP35S
	150	20×45	0.15	850	EKMH401E□□151MN45S
	150	22×40	0.15	880	EKMH401E□□151MP40S
	180	20×50	0.15	960	EKMH401E□□181MN50S
	180	22×45	0.15	990	EKMH401E□□181MP45S
	220	22×50	0.15	1,130	EKMH401E□□221MP50S
450	33	20×25	0.15	310	EKMH451E□□330MN25S
	47	22×25	0.15	420	EKMH451E□□470MP25S
	56	20×30	0.15	440	EKMH451E□□560MN30S
	68	20×35	0.15	510	EKMH451E□□680MN35S
	68	22×30	0.15	520	EKMH451E□□680MP30S
	82	20×40	0.15	600	EKMH451E□□820MN40S
	82	22×35	0.15	600	EKMH451E□□820MP35S
	100	20×45	0.15	690	EKMH451E□□101MN45S
	100	22×40	0.15	710	EKMH451E□□101MP40S
	120	20×50	0.15	780	EKMH451E□□121MN50S
	120	22×45	0.15	810	EKMH451E□□121MP45S
	150	22×50	0.15	930	EKMH451E□□151MP50S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency (Hz)	50	120	300	1k	10k	50k
160 to 250Vdc	0.81	1.00	1.17	1.32	1.45	1.50
400 & 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

200 to 450Vdc, Downsized, 105℃

PAG Series

- Downsize, high ripple design (ϕ10 to 18)
- Rated voltage range : 200 to 450Vdc., Capacitance range : 18 to 560μF
- Endurance with ripple current : 2,000 hours at 105℃
- Ideal for low profile power supply application
- Non solvent-proof type
- **RoHS Compliant**

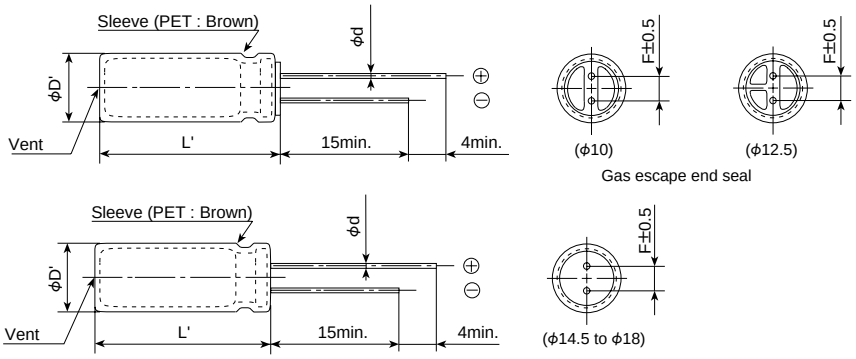
PAG
Downsized
Higher ripple
KMG

◆SPECIFICATIONS

Items	Characteristics					
Category Temperature Range	−40 to +105℃ (200, 400Vdc) −25 to+105℃ (420, 450Vdc)					
Rated Voltage Range	200 to 450Vdc					
Capacitance Tolerance	±20% (M)					(at 20℃, 120Hz)
Leakage Current		After 1 minute	After 5 minutes			
	CV≦1,000	I=0.1CV+40	I=0.03CV+15			
	CV>1,000	I=0.04CV+100	I=0.02CV+25			
	Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)					(at 20℃)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	200V	400V	420V	450V	
	tanδ (Max.)	0.12	0.15	0.20	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	200V	400V	420V	450V	
	Z(−25℃)/Z(+20℃)	3	5	6	6	
	Z(−40℃)/Z(+20℃)	6	6	—	—	(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 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 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	≦500% of the initial specified value				

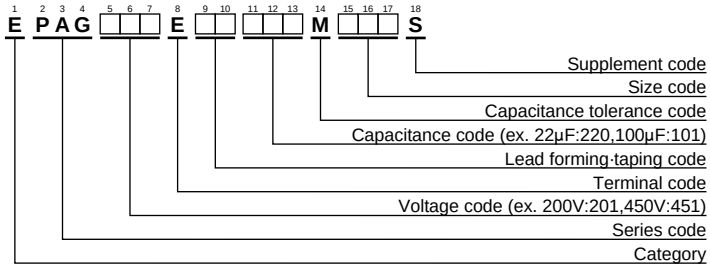
◆DIMENSIONS [mm]

●Terminal Code : E



ϕD	10	12.5	14.5	16	18
ϕd	0.6	0.6	0.8	0.8	0.8
F	5.0	5.0	7.5	7.5	7.5
ϕD'	ϕD+0.5 max.				
L'	L+2.0 max.				

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

200 to 450Vdc, Downsized, 105℃

PAG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
200	82	10×30	0.12	440	EPAG201E□□820MJ30S
	100	10×35	0.12	510	EPAG201E□□101MJ35S
	120	10×40	0.12	590	EPAG201E□□121MJ40S
	150	12.5×30	0.12	650	EPAG201E□□151MK30S
	180	12.5×35	0.12	750	EPAG201E□□181MK35S
	220	12.5×40	0.12	830	EPAG201E□□221MK40S
	220	14.5×30	0.12	830	EPAG201E□□221MU30S
	270	14.5×35	0.12	960	EPAG201E□□271MU35S
	270	16×30	0.12	960	EPAG201E□□271ML30S
	330	16×35	0.12	1,100	EPAG201E□□331ML35S
	330	18×30	0.12	1,100	EPAG201E□□331MM30S
	390	16×40	0.12	1,240	EPAG201E□□391ML40S
	390	18×35	0.12	1,240	EPAG201E□□391MM35S
	470	18×40	0.12	1,390	EPAG201E□□471MM40S
	560	18×45	0.12	1,560	EPAG201E□□561MM45S
400	27	10×30	0.15	260	EPAG401E□□270MJ30S
	33	10×35	0.15	300	EPAG401E□□330MJ35S
	39	10×40	0.15	340	EPAG401E□□390MJ40S
	47	12.5×30	0.15	370	EPAG401E□□470MK30S
	56	12.5×35	0.15	420	EPAG401E□□560MK35S
	68	12.5×40	0.15	480	EPAG401E□□680MK40S
	68	14.5×30	0.15	480	EPAG401E□□680MU30S
	82	14.5×35	0.15	530	EPAG401E□□820MU35S
	100	14.5×40	0.15	580	EPAG401E□□101MU40S
	100	16×30	0.15	580	EPAG401E□□101ML30S
	120	16×35	0.15	670	EPAG401E□□121ML35S
	120	18×30	0.15	670	EPAG401E□□121MM30S
	150	16×40	0.15	770	EPAG401E□□151ML40S
	150	18×35	0.15	770	EPAG401E□□151MM35S
	180	18×40	0.15	880	EPAG401E□□181MM40S
	220	18×45	0.15	1,000	EPAG401E□□221MM45S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
420	22	10×30	0.20	230	EPAG421E□□220MJ30S
	27	10×35	0.20	270	EPAG421E□□270MJ35S
	33	10×40	0.20	310	EPAG421E□□330MJ40S
	39	12.5×30	0.20	330	EPAG421E□□390MK30S
	47	12.5×35	0.20	390	EPAG421E□□470MK35S
	56	12.5×40	0.20	430	EPAG421E□□560MK40S
	56	14.5×30	0.20	430	EPAG421E□□560MU30S
	68	14.5×35	0.20	510	EPAG421E□□680MU35S
	68	16×30	0.20	510	EPAG421E□□680ML30S
	82	14.5×40	0.20	570	EPAG421E□□820MU40S
	82	16×35	0.20	570	EPAG421E□□820ML35S
	100	16×40	0.20	610	EPAG421E□□101ML40S
	100	18×30	0.20	610	EPAG421E□□101MM30S
	120	18×35	0.20	690	EPAG421E□□121MM35S
	150	18×40	0.20	790	EPAG421E□□151MM40S
450	18	10×30	0.20	210	EPAG451E□□180MJ30S
	22	10×35	0.20	240	EPAG451E□□220MJ35S
	27	10×40	0.20	280	EPAG451E□□270MJ40S
	33	12.5×30	0.20	310	EPAG451E□□330MK30S
	39	12.5×35	0.20	350	EPAG451E□□390MK35S
	47	12.5×40	0.20	390	EPAG451E□□470MK40S
	47	14.5×30	0.20	390	EPAG451E□□470MU30S
	56	14.5×35	0.20	440	EPAG451E□□560MU35S
	56	16×30	0.20	440	EPAG451E□□560ML30S
	68	14.5×40	0.20	500	EPAG451E□□680MU40S
	68	16×35	0.20	500	EPAG451E□□680ML35S
	82	16×40	0.20	550	EPAG451E□□820ML40S
	82	18×30	0.20	550	EPAG451E□□820MM30S
	100	18×35	0.20	650	EPAG451E□□101MM35S
	120	18×40	0.20	740	EPAG451E□□121MM40S
	150	18×45	0.20	810	EPAG451E□□151MM45S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
18 to 82	1.00	1.50	1.75	1.80
100 to 560	1.00	1.30	1.40	1.50

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Overvoltage-proof design, 105℃

KLJ Series

- No sparks against DC over-voltage
- Endurance with ripple current : 2,000 hours at 105℃
- Non solvent-proof type
- Prescribe the ESR value
- **RoHS Compliant**

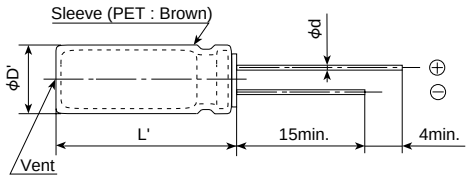
KLJ
↑ Downsized
KLG

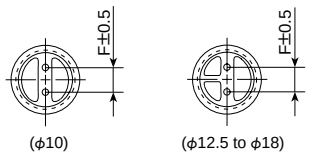
◆SPECIFICATIONS

Items	Characteristics			
Category Temperature Range	−25 to +105℃			
Rated Voltage Range	200 & 400Vdc			
Capacitance Tolerance	±20% (M)			(at 20℃, 120Hz)
Leakage Current	I=0.04CV+100 Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)			(at 20℃ after 1 minute)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	200V	400V	
	tanδ (Max.)	0.20	0.24	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	200V	400V	
	Z(−25℃)/Z(+20℃)	4	6	(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 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 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	≦500% of the initial specified value		

◆DIMENSIONS [mm]

- Terminal Code : E





ϕD	10	12.5	16	18
ϕd	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5
ϕD'	ϕD+0.5max.			
L'	L+1.5max.			

◆PART NUMBERING SYSTEM

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

Supplement code (sleeve PET:S, PbfreePVC:M)
Size code
Capacitance tolerance code
Capacitance code (ex. 100μF:101,4.7μF:4R7)
Lead forming·taping code
Terminal code
Voltage code (ex. 200V:201,400V:401)
Series code
Category

Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Overvoltage-proof design, 105℃

KLJ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	ESR (Ωmax/20℃, 100kHz)	Rated ripple current (mArms/105℃, 120Hz)	Part No.
200	33	10X20	0.20	1.8	165	EKLJ201E□□330MJ20S
	39	10X25	0.20	1.4	200	EKLJ201E□□390MJ25S
	56	12.5X20	0.20	1.0	265	EKLJ201E□□560MK20S
	82	12.5X25	0.20	0.72	350	EKLJ201E□□820MK25S
	100	16X20	0.20	0.63	390	EKLJ201E□□101ML20S
	120	16X25	0.20	0.44	465	EKLJ201E□□121ML25S
	150	18X20	0.20	0.31	505	EKLJ201E□□151MM20S
	180	16X31.5	0.20	0.36	615	EKLJ201E□□181MLN3S
	180	18X25	0.20	0.30	585	EKLJ201E□□181MM25S
	220	16X35.5	0.20	0.30	695	EKLJ201E□□221MLP1S
	220	18X31.5	0.20	0.28	700	EKLJ201E□□221MMN3S
	270	18X35.5	0.20	0.24	805	EKLJ201E□□271MMP1S
	330	18X40	0.20	0.21	900	EKLJ201E□□331MM40S
400	4.7	10X12.5	0.24	8.4	36	EKLJ401E□□4R7MJC5S
	10	10X16	0.24	5.7	64	EKLJ401E□□100MJ16S
	15	10X20	0.24	4.0	105	EKLJ401E□□150MJ20S
	18	10X25	0.24	3.2	110	EKLJ401E□□180MJ25S
	22	12.5X20	0.24	2.7	165	EKLJ401E□□220MK20S
	27	12.5X25	0.24	1.9	200	EKLJ401E□□270MK25S
	33	16X20	0.24	1.5	225	EKLJ401E□□330ML20S
	39	18X20	0.24	1.2	255	EKLJ401E□□390MM20S
	39	18X25	0.24	0.72	270	EKLJ401E□□390MM25S
	47	16X25	0.24	1.1	290	EKLJ401E□□470ML25S
	47	18X20	0.24	1.2	280	EKLJ401E□□470MM20S
	56	16X31.5	0.24	0.84	340	EKLJ401E□□560MLN3S
	68	16X35.5	0.24	0.72	385	EKLJ401E□□680MLP1S
	68	18X25	0.24	0.88	360	EKLJ401E□□680MM25S
	82	16X40	0.24	0.65	435	EKLJ401E□□820ML40S
	82	18X31.5	0.24	0.64	425	EKLJ401E□□820MMN3S
	100	18X35.5	0.24	0.54	490	EKLJ401E□□101MMP1S
	120	18X40	0.24	0.49	540	EKLJ401E□□121MM40S

□□ : Fill with appropriate lead forming or taping code.
Sleeve PET : suffix is S, PbfreePVC : suffix is M

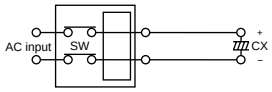
◆DC OVERVOLTAGE TEST CONDITIONS

The vent will be operated and the capacitor shall become an open circuit without burning materials when the following excess DC voltage is applied.

●Test DC voltage

Rated voltage	Current limit	Test DC voltage
200Vdc	4A	300/375Vdc
400Vdc	2A	500/600Vdc

●Test circuit



Constant DC voltage/current power supply

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency (Hz)	50	120	300	1k	10k	50k	100k
4.7 to 10μF	0.65	1.00	1.35	1.75	2.30	2.50	2.70
15 to 47μF	0.75	1.00	1.25	1.50	1.75	1.80	1.85
56 to 330μF	0.80	1.00	1.15	1.30	1.40	1.50	1.60

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Overvoltage-proof design, 105℃

KLG Series

- No sparks against DC over-voltage
- Endurance with ripple current : 2,000 hours at 105℃
- Non solvent-proof type
- **RoHS Compliant**

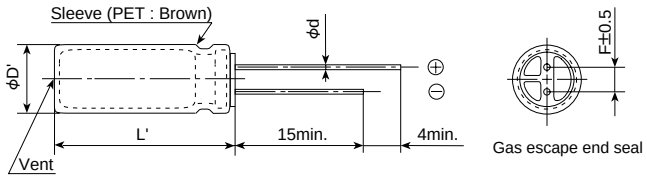
KLJ
Downsized
KLG

◆SPECIFICATIONS

Items	Characteristics			
Category Temperature Range	−25 to +105℃			
Rated Voltage Range	200 & 400Vdc			
Capacitance Tolerance	±20% (M)			(at 20℃, 120Hz)
Leakage Current	I=0.04CV+100 Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)			(at 20℃ after 1 minute)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	200V	400V	
	tanδ (Max.)	0.20	0.24	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	200V	400V	
	Z(−25℃)/Z(+20℃)	4	6	(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 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 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	≦500% of the initial specified value		

◆DIMENSIONS [mm]

- Terminal Code : E



ϕD	16	18
ϕd	0.8	
F	7.5	
ϕD'	ϕD+0.5max.	
L'	L+1.5max.	

◆PART NUMBERING SYSTEM

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

Supplement code
Size code
Capacitance tolerance code
Capacitance code (ex. 47μF:470,100μF:101)
Lead forming·taping code
Terminal code
Voltage code (ex. 200V:201,400V:401)
Series code
Category

Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Overvoltage-proof design, 105℃

KLG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
200	82	16×20	0.20	230	EKLG201E□□820ML20S
	100	16×25	0.20	425	EKLG201E□□101ML25S
	100	18×20	0.20	250	EKLG201E□□101MM20S
	120	16×31.5	0.20	500	EKLG201E□□121MLN3S
	120	18×25	0.20	475	EKLG201E□□121MM25S
	130	18×20	0.20	285	EKLG201E□□131MM20S
	150	16×31.5	0.20	560	EKLG201E□□151MLN3S
	150	18×20	0.20	315	EKLG201E□□151MM20S
	150	18×25	0.20	530	EKLG201E□□151MM25S
	180	16×40	0.20	645	EKLG201E□□181ML40S
	180	18×31.5	0.20	630	EKLG201E□□181MMN3S
	220	18×35.5	0.20	725	EKLG201E□□221MMP1S
	220	18×40	0.20	735	EKLG201E□□221MM40S
	270	18×45	0.20	830	EKLG201E□□271MM45S
	330	18×45	0.20	920	EKLG201E□□331MM45S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/105℃,120Hz)	Part No.
400	22	16×20	0.24	145	EKLG401E□□220ML20S
	22	16×25	0.24	200	EKLG401E□□220ML25S
	33	16×25	0.24	220	EKLG401E□□330ML25S
	33	18×20	0.24	225	EKLG401E□□330MM20S
	39	16×31.5	0.24	245	EKLG401E□□390MLN3S
	39	18×25	0.24	250	EKLG401E□□390MM25S
	47	16×31.5	0.24	275	EKLG401E□□470MLN3S
	47	18×25	0.24	280	EKLG401E□□470MM25S
	56	16×40	0.24	350	EKLG401E□□560ML40S
	56	18×31.5	0.24	315	EKLG401E□□560MMN3S
	68	18×35.5	0.24	350	EKLG401E□□680MMP1S
	82	18×40	0.24	395	EKLG401E□□820MM40S
	100	18×40	0.24	450	EKLG401E□□101MM40S

□□ : Fill with appropriate lead forming or taping code.

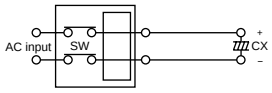
◆DC OVERVOLTAGE TEST CONDITIONS

The vent will be operated and the capacitor shall become an open circuit without burning materials when the following excess DC voltage is applied.

●Test DC voltage

Rated voltage	Current limit	Test DC voltage
200Vdc	4A	300/375Vdc
400Vdc	2A	500/600Vdc

●Test circuit



Constant DC voltage/current power supply

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

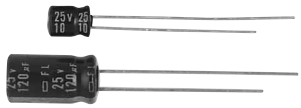
Frequency (Hz)	50	120	300	1k	10k	50k	100k
22 to 47μF	0.75	1.00	1.25	1.50	1.75	1.80	1.85
56 to 330μF	0.80	1.00	1.15	1.30	1.40	1.50	1.60

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.

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Long life for ϕ4 to ϕ8 product, 105℃

FL Series



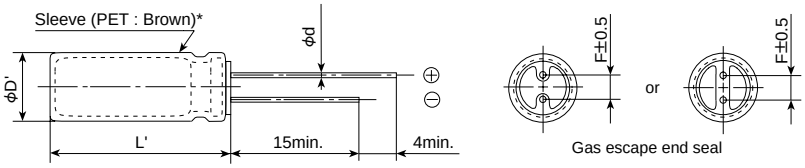
- Long life and high reliability for ϕ4×5L to ϕ8×7L mm range
- Endurance with ripple current : 3,000 hours at 105℃
- Suitable for long life and high reliability required products
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

◆SPECIFICATIONS

Items	Characteristics							
Category Temperature Range	−40 to +105℃							
Rated Voltage Range	6.3 to 50Vdc							
Capacitance Tolerance	±20% (M)							(at 20℃, 120Hz)
Leakage Current	I=0.03CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)							(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	
	tanδ (Max.)	0.50	0.40	0.35	0.30	0.25	0.25	(at 20℃, 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 3,000 hours at 105℃.							
	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 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 [mm]

- Terminal Code : E



* ϕ8×5L : Coating case

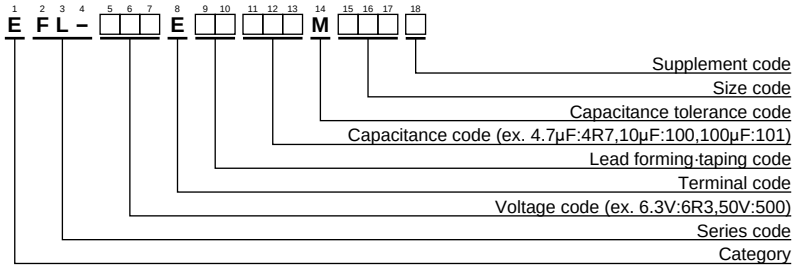
5mm Height

ϕD	4	5	6.3	8
ϕd	0.45	0.45	0.45	0.45
F	1.5	2.0	2.5	2.5
ϕD'	ϕD+0.5max.			
L'	L+1.0max.			

7mm Height

ϕD	4	5	6.3	8
ϕd	0.45	0.45	0.45	0.45
F	1.5	2.0	2.5	3.5
ϕD'	ϕD+0.5max.			
L'	L+1.0max.			

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Long life for φ4 to φ8 product, 105℃

FL Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Impedance (Ωmax/20℃, 100kHz)	Rated ripple current (mArms/105℃,100kHz)	Part No.
6.3	33	4×5	0.50	5.4	37	EFL-6R3E□□330MD05D
	47	4×7	0.50	4.5	44	EFL-6R3E□□470MD07D
	56	5×5	0.50	3.1	57	EFL-6R3E□□560ME05D
	82	5×7	0.50	2.5	70	EFL-6R3E□□820ME07D
	100	6.3×5	0.50	1.7	82	EFL-6R3E□□101MF05D
	150	6.3×7	0.50	1.3	116	EFL-6R3E□□151MF07D
	220	8×5	0.50	1.5	110	EFL-6R3E□□221MH05G
	270	8×7	0.50	0.90	162	EFL-6R3E□□271MH07D
10	22	4×5	0.40	5.4	37	EFL-100E□□220MD05D
	33	4×7	0.40	4.5	44	EFL-100E□□330MD07D
	33	5×5	0.40	3.1	57	EFL-100E□□330ME05D
	47	5×7	0.40	2.5	70	EFL-100E□□470ME07D
	68	6.3×5	0.40	1.7	82	EFL-100E□□680MF05D
	100	6.3×7	0.40	1.3	116	EFL-100E□□101MF07D
	150	8×5	0.40	1.5	110	EFL-100E□□151MH05G
	220	8×7	0.40	0.90	162	EFL-100E□□221MH07D
16	15	4×5	0.35	5.4	37	EFL-160E□□150MD05D
	22	4×7	0.35	4.5	44	EFL-160E□□220MD07D
	22	5×5	0.35	3.1	57	EFL-160E□□220ME05D
	33	5×7	0.35	2.5	70	EFL-160E□□330ME07D
	47	6.3×5	0.35	1.7	82	EFL-160E□□470MF05D
	68	6.3×7	0.35	1.3	116	EFL-160E□□680MF07D
	100	8×5	0.35	1.5	110	EFL-160E□□101MH05G
	150	8×7	0.35	0.90	162	EFL-160E□□151MH07D
25	10	4×5	0.30	5.4	37	EFL-250E□□100MD05D
	15	4×7	0.30	4.5	44	EFL-250E□□150MD07D
	15	5×5	0.30	3.1	57	EFL-250E□□150ME05D
	22	5×7	0.30	2.5	70	EFL-250E□□220ME07D
	33	6.3×5	0.30	1.7	82	EFL-250E□□330MF05D
	56	6.3×7	0.30	1.3	116	EFL-250E□□560MF07D
	68	8×5	0.30	1.5	110	EFL-250E□□680MH05G
	100	8×7	0.30	0.90	162	EFL-250E□□101MH07D
35	4.7	4×5	0.25	5.4	37	EFL-350E□□4R7MD05D
	6.8	4×7	0.25	4.5	44	EFL-350E□□6R8MD07D
	10	5×5	0.25	3.1	57	EFL-350E□□100ME05D
	10	5×7	0.25	2.5	70	EFL-350E□□100ME07D
	22	6.3×5	0.25	1.7	82	EFL-350E□□220MF05D
	22	6.3×7	0.25	1.3	116	EFL-350E□□220MF07D
	33	8×5	0.25	1.5	110	EFL-350E□□330MH05G
	47	8×7	0.25	0.90	162	EFL-350E□□470MH07D
50	0.47	4×5	0.25	34	14	EFL-500E□□R47MD05D
	1	4×5	0.25	19	18	EFL-500E□□1R0MD05D
	2.2	4×5	0.25	14	22	EFL-500E□□2R2MD05D
	3.3	4×5	0.25	11	26	EFL-500E□□3R3MD05D
	4.7	4×7	0.25	9.0	30	EFL-500E□□4R7MD07D
	4.7	5×5	0.25	6.0	40	EFL-500E□□4R7ME05D
	6.8	5×7	0.25	4.8	50	EFL-500E□□6R8ME07D
	10	6.3×5	0.25	2.9	63	EFL-500E□□100MF05D
	15	6.3×7	0.25	2.2	90	EFL-500E□□150MF07D
	22	8×5	0.25	2.6	84	EFL-500E□□220MH05G
	22	8×7	0.25	1.6	120	EFL-500E□□220MH07D

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance(μF) \ Frequency(Hz)	120	1k	10k	100k
to 3.3	0.20	0.66	0.90	1.00
4.7 to 6.8	0.35	0.70	0.90	1.00
10 to 150	0.40	0.75	0.90	1.00
220 to 270	0.50	0.85	0.94	1.00

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.

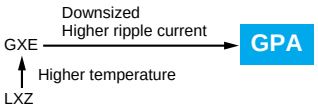
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Longer life, Downsized, 125℃

GPA Series

- ●Downsized, low impedance and High-Ripple Current version of GXE series
- ●For automobile modules and other high temperature applications
- ●Endurance with ripple current : 3,000 to 5,000 hours at 125℃
- ●High heat-resistance at 150℃
- ●Solvent-proof type
- ●**RoHS Compliant**

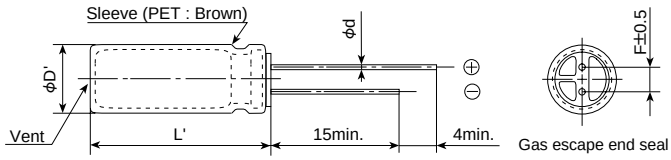


◆SPECIFICATIONS

Items	Characteristics				
Category Temperature Range	−40 to +125℃				
Rated Voltage Range	25 to 50Vdc				
Capacitance Tolerance	±20% (M)				(at 20℃, 120Hz)
Leakage Current	I=0.03CV or 4μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)				(at 20℃, 1 minute)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	25	35	50	
	tanδ (Max.)	0.14	0.12	0.10	
	When nominal capacitance exceeds 1,000μF, add 0.02 to the above value for each 1,000μF increase.				(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	25	35	50	
	Z(−25℃)/Z(+20℃)	2	2	2	
	Z(−40℃)/Z(+20℃)	4	4	4	(at 120Hz)
Endurance1	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 (3,000 hours for 25L and less) at 125℃.				
	Capacitance change	≦±30% of the initial value			
	D.F. (tanδ)	≦300% of the initial specified value			
	Leakage current	≦The initial specified value			
Endurance2	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the test condition that be exposed them for 500 hours (250 hours for 25L and less) at 150℃ without voltage applied and DC voltage with the rated ripple current is applied for 3,600 hours (2,300 hours for 25L and less) at 125℃.				
	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 1,000 hours at 125℃ without voltage applied.				
	Capacitance change	≦±30% of the initial value			
	D.F. (tanδ)	≦300% of the initial specified value			
	Leakage current	≦The initial specified value			

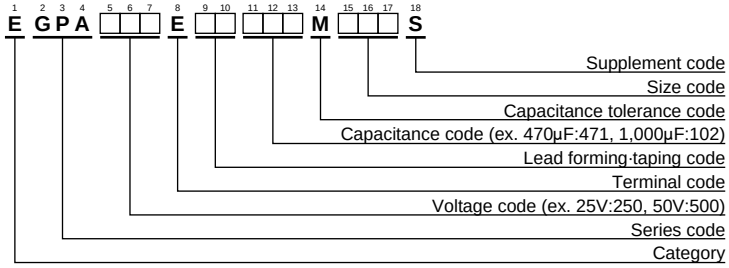
◆DIMENSIONS [mm]

●Terminal Code : E



φD	12.5	14.5	16	18
φd	0.6	0.8	0.8	0.8
F	5.0	7.5	7.5	7.5
φD'	φD+0.5max.			
L'	L+1.5max.			

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Longer life, Downsized, 125℃

GPA Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	ESR (Ωmax/100kHz) 20℃	ESR (Ωmax/100kHz) -40℃	Rated ripple current (mArms/125℃, 100kHz)	Part No.
25	1,200	12.5×20	0.044	0.22	1,820	EGPA250E□□122MK20S
	1,500	14.5×20	0.037	0.19	2,100	EGPA250E□□152MU20S
	1,800	12.5×25	0.033	0.17	2,280	EGPA250E□□182MK25S
	1,800	16×20	0.034	0.17	2,280	EGPA250E□□182ML20S
	2,200	12.5×30	0.029	0.13	2,560	EGPA250E□□222MK30S
	2,200	14.5×25	0.028	0.14	2,620	EGPA250E□□222MU25S
	2,700	12.5×35	0.024	0.11	2,970	EGPA250E□□272MK35S
	2,700	14.5×30	0.023	0.10	3,060	EGPA250E□□272MU30S
	2,700	16×25	0.026	0.13	2,860	EGPA250E□□272ML25S
	2,700	18×20	0.032	0.16	2,490	EGPA250E□□272MM20S
	3,300	12.5×40	0.021	0.095	3,340	EGPA250E□□332MK40S
	3,300	14.5×35	0.021	0.095	3,380	EGPA250E□□332MU35S
	3,300	16×30	0.023	0.10	3,160	EGPA250E□□332ML30S
	3,900	16×35	0.020	0.090	3,590	EGPA250E□□392ML35S
	3,900	18×25	0.024	0.12	3,010	EGPA250E□□392MM25S
	4,700	14.5×40	0.018	0.081	3,730	EGPA250E□□472MU40S
	4,700	18×30	0.022	0.099	3,390	EGPA250E□□472MM30S
	5,600	16×40	0.017	0.077	3,970	EGPA250E□□562ML40S
	5,600	18×35	0.019	0.086	3,840	EGPA250E□□562MM35S
	6,800	18×40	0.016	0.072	4,230	EGPA250E□□682MM40S
35	680	12.5×20	0.044	0.22	1,820	EGPA350E□□681MK20S
	1,000	12.5×25	0.033	0.17	2,280	EGPA350E□□102MK25S
	1,000	14.5×20	0.037	0.19	2,100	EGPA350E□□102MU20S
	1,200	12.5×30	0.029	0.13	2,560	EGPA350E□□122MK30S
	1,200	16×20	0.034	0.17	2,280	EGPA350E□□122ML20S
	1,200	14.5×25	0.028	0.14	2,620	EGPA350E□□122MU25S
	1,500	12.5×35	0.024	0.11	2,970	EGPA350E□□152MK35S
	1,500	14.5×30	0.023	0.10	3,060	EGPA350E□□152MU30S
	1,500	18×20	0.032	0.16	2,490	EGPA350E□□152MM20S
	1,800	12.5×40	0.021	0.095	3,340	EGPA350E□□182MK40S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	ESR (Ωmax/100kHz) 20℃	ESR (Ωmax/100kHz) -40℃	Rated ripple current (mArms/125℃, 100kHz)	Part No.
35	1,800	16×25	0.026	0.13	2,860	EGPA350E□□182ML25S
	2,200	14.5×35	0.021	0.095	3,380	EGPA350E□□222MU35S
	2,200	16×30	0.023	0.10	3,160	EGPA350E□□222ML30S
	2,200	18×25	0.024	0.12	3,010	EGPA350E□□222MM25S
	2,700	14.5×40	0.018	0.081	3,730	EGPA350E□□272MU40S
	2,700	16×35	0.020	0.090	3,590	EGPA350E□□272ML35S
	2,700	18×30	0.022	0.099	3,390	EGPA350E□□272MM30S
	3,300	16×40	0.017	0.077	3,970	EGPA350E□□332ML40S
	3,300	18×35	0.019	0.086	3,840	EGPA350E□□332MM35S
	4,700	18×40	0.016	0.072	4,230	EGPA350E□□472MM40S
50	470	12.5×20	0.065	0.33	1,500	EGPA500E□□471MK20S
	560	14.5×20	0.055	0.28	1,740	EGPA500E□□561MU20S
	680	12.5×25	0.048	0.24	1,900	EGPA500E□□681MK25S
	680	16×20	0.043	0.22	2,040	EGPA500E□□681ML20S
	820	12.5×30	0.041	0.18	2,150	EGPA500E□□821MK30S
	820	14.5×25	0.040	0.20	2,190	EGPA500E□□821MU25S
	1,000	12.5×35	0.034	0.15	2,510	EGPA500E□□102MK35S
	1,000	14.5×30	0.036	0.16	2,470	EGPA500E□□102MU30S
	1,000	16×25	0.031	0.16	2,620	EGPA500E□□102ML25S
	1,000	18×20	0.039	0.20	2,240	EGPA500E□□102MM20S
	1,200	12.5×40	0.028	0.13	2,870	EGPA500E□□122MK40S
	1,200	14.5×35	0.029	0.13	2,840	EGPA500E□□122MU35S
	1,200	16×30	0.027	0.13	2,940	EGPA500E□□122ML30S
	1,200	18×25	0.029	0.15	2,750	EGPA500E□□122MM25S
	1,500	16×35	0.023	0.10	3,300	EGPA500E□□152ML35S
	1,800	14.5×40	0.024	0.11	3,230	EGPA500E□□182MU40S
	1,800	18×30	0.026	0.12	3,140	EGPA500E□□182MM30S
	2,200	16×40	0.020	0.090	3,720	EGPA500E□□222ML40S
	2,200	18×35	0.022	0.10	3,510	EGPA500E□□222MM35S
	2,700	18×40	0.018	0.080	3,940	EGPA500E□□272MM40S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance(μF) \ Frequency(Hz)	120	1k	10k	100k
470 to 560	0.50	0.85	0.94	1.00
680 to 1,800	0.60	0.87	0.95	1.00
2,200 to 3,900	0.75	0.90	0.95	1.00
4,700 to 6,800	0.85	0.95	0.98	1.00

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Long Life, Downsized, 125℃

GXE Series

- For automobile modules and other high temperature applications
- Downsize, long life, low impedance and better low temperature characteristics
- Endurance with ripple current : 2,000 to 5,000 hours at 125℃
- Solvent-proof type except 63 to 450V (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

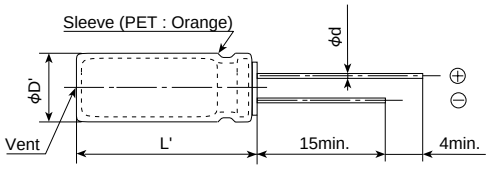
GXE Longer life → GXL

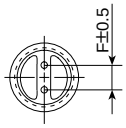
◆SPECIFICATIONS

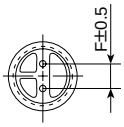
Items	Characteristics
Category Temperature Range	−40 to +125℃ (10 to 250Vdc) −25 to +125℃ (350 to 450Vdc)
Rated Voltage Range	10 to 450Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	10 to 100Vdc: I=0.03CV or 4μA, whichever is greater. 160 to 450Vdc: CV≦1,000 I=0.1CV+40; CV>1,000 I=0.04CV+100 Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃, 1 minute)
Dissipation Factor (tanδ)	Rated voltage (Vdc): 10V 16V 25V 35V 50V 63V 80V 100V 160 to 250V 350 to 450V tanδ (Max.): 0.20 0.16 0.14 0.12 0.10 0.10 0.08 0.08 0.20 0.24 When nominal capacitance exceeds 1,000μF, add 0.02 to the above value for each 1,000μF increase. (at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc): 10V 16V 25V 35V 50V 63V 80V 100V 160 to 250V 350 to 450V Z(−25℃)/Z(+20℃): 3 2 2 2 2 2 2 2 3 6 Z(−40℃)/Z(+20℃): 6 4 4 4 4 4 4 4 6 — (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 the specified time at 125℃. Time: φ8 : 2,000hours φ10 : 3,000hours φ12.5 & φ16 : 5,000hours / 2,000hours Capacitance change: ≦±30% of the initial value / ≦±20% of the initial value D.F. (tanδ): ≦300% of the initial specified value / ≦200% of the initial specified value Leakage current: ≦The initial specified value / ≦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 (500 hours for 350 to 450WV) at 125℃ without voltage applied. Capacitance change: ≦±30% of the initial value / ≦±20% of the initial value D.F. (tanδ): ≦300% of the initial specified value / ≦200% of the initial specified value Leakage current: ≦The initial specified value / ≦500% of the initial specified value

◆DIMENSIONS [mm]

- Terminal Code : E







Gas escape end seal

φD	8	10	12.5	16
φd	0.6	0.6	0.6	0.8
F	3.5	5.0	5.0	7.5
φD'	φD+0.5max.			
L'	L+2.0max.			

◆PART NUMBERING SYSTEM

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

- Supplement code
- Size code
- Capacitance tolerance code
- Capacitance code (ex. 4.7μF:4R7,10μF:100,100μF:101)
- Lead forming·taping code
- Terminal code
- Voltage code (ex. 10V:100,100V:101)
- Series code
- Category

Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Long Life, Downsized, 125℃

GXE Series

◆STANDARD RATINGS

is non solvent-proof.

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/ 20℃, 100kHz)	Rated ripple current (mArms/ 125℃, Note1)	Part No.
10	220	8× 12	0.32	340	EGXE100E□□221MH12D
	330	10× 12.5	0.15	620	EGXE100E□□331MJC5S
	470	10× 12.5	0.15	620	EGXE100E□□471MJC5S
	1,000	10× 20	0.075	950	EGXE100E□□102MJ20S
	2,200	12.5× 25	0.040	1,350	EGXE100E□□222MK25S
	3,300	16× 25	0.031	1,620	EGXE100E□□332ML25S
	4,700	16× 31.5	0.025	1,860	EGXE100E□□472MLN3S
16	100	8× 12	0.32	340	EGXE160E□□101MH12D
	220	10× 12.5	0.15	620	EGXE160E□□221MJC5S
	330	10× 12.5	0.15	620	EGXE160E□□331MJC5S
	470	10× 16	0.094	790	EGXE160E□□471MJ16S
	1,000	12.5× 20	0.058	1,080	EGXE160E□□102MK20S
	2,200	16× 25	0.031	1,620	EGXE160E□□222ML25S
	3,300	16× 31.5	0.025	1,860	EGXE160E□□332MLN3S
25	100	8× 12	0.32	340	EGXE250E□□101MH12D
	220	10× 12.5	0.15	620	EGXE250E□□221MJC5S
	330	10× 16	0.094	790	EGXE250E□□331MJ16S
	470	10× 20	0.075	950	EGXE250E□□471MJ20S
	1,000	12.5× 25	0.040	1,350	EGXE250E□□102MK25S
	2,200	16× 31.5	0.025	1,860	EGXE250E□□222MLN3S
35	100	8× 12	0.32	340	EGXE350E□□101MH12D
	100	10× 12.5	0.15	620	EGXE350E□□101MJC5S
	220	10× 16	0.094	790	EGXE350E□□221MJ16S
	330	10× 20	0.075	950	EGXE350E□□331MJ20S
	470	12.5× 20	0.058	1,080	EGXE350E□□471MK20S
	1,000	16× 25	0.031	1,620	EGXE350E□□102ML25S
50	10	8× 12	0.75	180	EGXE500E□□100MH12D
	22	8× 12	0.50	250	EGXE500E□□220MH12D
	33	8× 12	0.50	280	EGXE500E□□330MH12D
	47	8× 12	0.50	280	EGXE500E□□470MH12D
	100	10× 12.5	0.20	520	EGXE500E□□101MJC5S
	220	10× 20	0.098	880	EGXE500E□□221MJ20S
	330	12.5× 20	0.081	990	EGXE500E□□331MK20S
	470	12.5× 25	0.059	1,150	EGXE500E□□471MK25S
	1,000	16× 31.5	0.032	1,590	EGXE500E□□102MLN3S
63	33	8× 12	1.5	150	EGXE630E□□330MH12D
	47	10× 12.5	0.59	530	EGXE630E□□470MJC5S
	100	10× 16	0.41	690	EGXE630E□□101MJ16S
	220	12.5× 20	0.16	1,050	EGXE630E□□221MK20S
	330	12.5× 25	0.12	1,290	EGXE630E□□331MK25S
	470	12.5× 30	0.097	1,460	EGXE630E□□471MK30S
	1,000	16× 31.5	0.059	1,850	EGXE630E□□102MLN3S
80	22	8× 12	1.5	150	EGXE800E□□220MH12D
	33	10× 12.5	0.8	480	EGXE800E□□330MJC5S
80	47	10×12.5	0.80	480	EGXE800E□□470MJC5S
	100	10×20	0.39	790	EGXE800E□□101MJ20S
	220	12.5×25	0.18	1,240	EGXE800E□□221MK25S
	330	12.5×30	0.16	1,390	EGXE800E□□331MK30S
	470	16×25	0.11	1,500	EGXE800E□□471ML25S
100	4.7	8×12	2.0	130	EGXE101E□□4R7MH12D
	10	8×12	1.5	150	EGXE101E□□100MH12D
	22	10×12.5	0.80	480	EGXE101E□□220MJC5S
	33	10×12.5	0.80	480	EGXE101E□□330MJC5S
	47	10×16	0.55	630	EGXE101E□□470MJ16S
	100	12.5×20	0.25	990	EGXE101E□□101MK20S
	220	16×25	0.11	1,500	EGXE101E□□221ML25S
	330	16×31.5	0.079	1,790	EGXE101E□□331MLN3S
160	22	10×20	—	115	EGXE161E□□220MJ20S
	33	10×25	—	154	EGXE161E□□330MJ25S
	47	12.5×20	—	187	EGXE161E□□470MK20S
	68	12.5×25	—	245	EGXE161E□□680MK25S
	100	16×25	—	329	EGXE161E□□101ML25S
	150	16×31.5	—	434	EGXE161E□□151MLN3S
200	10	10×20	—	78	EGXE201E□□100MJ20S
	22	10×25	—	126	EGXE201E□□220MJ25S
	33	12.5×20	—	157	EGXE201E□□330MK20S
	47	12.5×25	—	204	EGXE201E□□470MK25S
	68	16×20	—	250	EGXE201E□□680ML20S
	100	16×25	—	329	EGXE201E□□101ML25S
250	10	10×20	—	78	EGXE251E□□100MJ20S
	22	12.5×20	—	128	EGXE251E□□220MK20S
	33	12.5×25	—	171	EGXE251E□□330MK25S
	47	16×25	—	225	EGXE251E□□470ML25S
	68	16×31.5	—	292	EGXE251E□□680MLN3S
350	4.7	10×20	—	53	EGXE351E□□4R7MJ20S
	10	10×25	—	85	EGXE351E□□100MJ25S
	22	12.5×25	—	139	EGXE351E□□220MK25S
	33	16×25	—	189	EGXE351E□□330ML25S
	47	16×31.5	—	243	EGXE351E□□470MLN3S
400	4.7	10×20	—	53	EGXE401E□□4R7MJ20S
	10	10×25	—	86	EGXE401E□□100MJ25S
	22	12.5×30	—	142	EGXE401E□□220MK30S
	33	16×25	—	189	EGXE401E□□330ML25S
	47	16×31.5	—	243	EGXE401E□□470MLN3S
450	4.7	10×25	—	58	EGXE451E□□4R7MJ25S
	10	12.5×20	—	86	EGXE451E□□100MK20S
	22	16×25	—	154	EGXE451E□□220ML25S
	33	16×31.5	—	203	EGXE451E□□330MLN3S

□□ : Fill with appropriate lead forming or taping code.

(Note1) Ripple current frequency

10 to 100V = 100kHz

160 to 450V = 120Hz

◆RATED RIPPLE CURRENT MULTIPLIERS

●(10 to 100Vdc) Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
4.7 to 100	0.40	0.75	0.90	1.00
220 to 470	0.50	0.85	0.94	1.00
1,000	0.60	0.87	0.95	1.00
2,200 to 3,300	0.75	0.90	0.95	1.00
4,700	0.85	0.95	0.98	1.00

●(160 to 450Vdc) Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	50	120	300	1k	10k	100k
4.7 to 33	0.75	1.00	1.25	1.50	1.75	1.80
47 to 150	0.80	1.00	1.15	1.30	1.40	1.50

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Longer life, 125℃

GXL Series

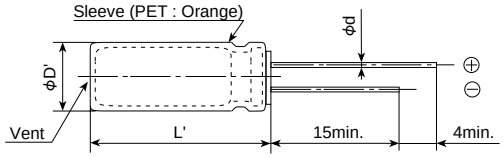
- Long-Life version of GXE series
- For automobile modules and other high temperature applications
- Endurance with ripple current : 5,000 to 10,000 hours at 125℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

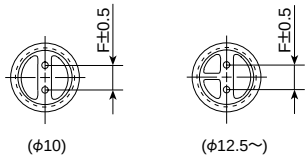
◆SPECIFICATIONS

Items	Characteristics						
Category Temperature Range	−40 to +125℃						
Rated Voltage Range	10 to 50Vdc						
Capacitance Tolerance	±20% (M)						(at 20℃, 120Hz)
Leakage Current	I=0.03CV or 4μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)						(at 20℃, 1 minute)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	10V	16V	25V	35V	50V	
	tanδ (Max.)	0.20	0.16	0.14	0.12	0.10	
	When nominal capacitance exceeds 1,000μF, add 0.02 to the above value for each 1,000μF increase.						(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	10V	16V	25V	35V	50V	
	Z(−25℃)/Z(+20℃)	3	2	2	2	2	
	Z(−40℃)/Z(+20℃)	6	4	4	4	4	(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 10,000 hours (5,000 hours for φ10) at 125℃.						
	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 1,000 hours at 125℃ without voltage applied.						
	Capacitance change	≦±30% of the initial value					
	D.F. (tanδ)	≦300% of the initial specified value					
	Leakage current	≦The initial specified value					

◆DIMENSIONS [mm]

- Terminal Code : E





φD	10	12.5	16
φd	0.6	0.6	0.8
F	5.0	5.0	7.5
φD'	φD+0.5max.		
L'	L+1.5max.		

◆PART NUMBERING SYSTEM

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

- Supplement code
- Size code
- Capacitance tolerance code
- Capacitance code (ex. 100μF:101, 1,000μF:102)
- Lead forming·taping code
- Terminal code
- Voltage code (ex. 10V:100, 50V:500)
- Series code
- Category

Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Longer life, 125℃

GXL Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/20℃, 100kHz)	Rated ripple current (mArms/125℃, 100kHz)	Part No.
10	330	10×12.5	0.17	800	EGXL100E□□331MJC5S
	470	10×12.5	0.17	800	EGXL100E□□471MJC5S
	1,000	10×20	0.094	1,300	EGXL100E□□102MJ20S
	2,200	12.5×25	0.055	2,050	EGXL100E□□222MK25S
	3,300	16×25	0.035	2,500	EGXL100E□□332ML25S
	4,700	16×31.5	0.027	3,000	EGXL100E□□472MLN3S
16	220	10×12.5	0.17	800	EGXL160E□□221MJC5S
	330	10×12.5	0.17	800	EGXL160E□□331MJC5S
	470	10×16	0.12	1,050	EGXL160E□□471MJ16S
	1,000	12.5×20	0.067	1,650	EGXL160E□□102MK20S
	2,200	16×25	0.035	2,500	EGXL160E□□222ML25S
	3,300	16×31.5	0.027	3,000	EGXL160E□□332MLN3S
25	220	10×12.5	0.17	800	EGXL250E□□221MJC5S
	330	10×16	0.12	1,050	EGXL250E□□331MJ16S
	470	10×20	0.094	1,300	EGXL250E□□471MJ20S
	1,000	12.5×25	0.055	2,050	EGXL250E□□102MK25S
	2,200	16×31.5	0.027	3,000	EGXL250E□□222MLN3S
35	100	10×12.5	0.17	800	EGXL350E□□101MJC5S
	220	10×16	0.12	1,050	EGXL350E□□221MJ16S
	330	10×20	0.094	1,300	EGXL350E□□331MJ20S
	470	12.5×20	0.067	1,650	EGXL350E□□471MK20S
	1,000	16×25	0.035	2,500	EGXL350E□□102ML25S
50	100	10×12.5	0.30	590	EGXL500E□□101MJC5S
	220	10×20	0.19	970	EGXL500E□□221MJ20S
	330	12.5×20	0.11	1,380	EGXL500E□□331MK20S
	470	12.5×25	0.085	1,700	EGXL500E□□471MK25S
	1,000	16×31.5	0.043	2,490	EGXL500E□□102MLN3S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance(μF) \ Frequency(Hz)	120	1k	10k	100k
100	0.40	0.75	0.90	1.00
220 to 470	0.50	0.85	0.94	1.00
1,000	0.60	0.87	0.95	1.00
2,200 to 3,300	0.75	0.90	0.95	1.00
4,700	0.85	0.95	0.98	1.00

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

High Temperature, 150℃

New!

GHA Series

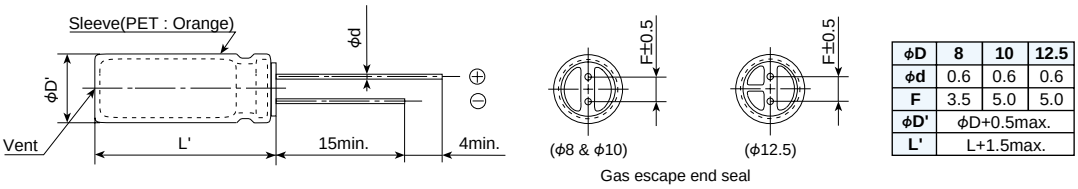
- For automobile modules and other high temperature applications
- Endurance with ripple current : 150℃ 1,000 hours
- Solvent-proof type
- **RoHS Compliant**

◆SPECIFICATIONS

Items	Characteristics					
Category Temperature Range	−40 to +150℃					
Rated Voltage Range	10 to 35Vdc					
Capacitance Tolerance	±20% (M)					(at 20℃, 120Hz)
Leakage Current	I=0.03CV or 4μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)					(at 20℃, 1 minute)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	10V	16V	25V	35V	
	tanδ (Max.)	0.20	0.16	0.14	0.12	
	When nominal capacitance exceed 1,000μF, 0.02 shall be added each 1,000μF increase.					(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	10V	16V	25V	35V	
	Z(−25℃)/Z(+20℃)	3	2	2	2	
	Z(−40℃)/Z(+20℃)	6	4	4	4	(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 1,000 hours at 150℃.					
	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 1,000 hours at 150℃ without voltage applied.					
	Capacitance change	≦±30% of the initial value				
	D.F. (tanδ)	≦300% of the initial specified value				
	Leakage current	≦The initial specified value				

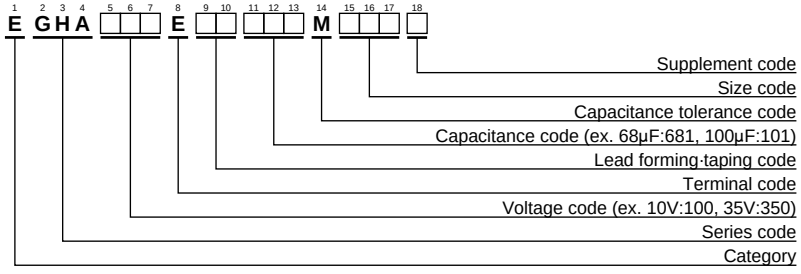
◆DIMENSIONS [mm]

- Terminal Code : E



φD	8	10	12.5
φd	0.6	0.6	0.6
F	3.5	5.0	5.0
φD'	φD+0.5max.		
L'	L+1.5max.		

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

High Temperature, 150℃

New!

GHA Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/ 150℃,100kHz)	Part No.
10	220	8×12	0.20	270	EGHA100E□□221MH12D
	330	8×12	0.20	270	EGHA100E□□331MH12D
	470	8×12	0.20	270	EGHA100E□□471MH12D
	560	10×12.5	0.20	510	EGHA100E□□561MJC5S
	680	10×16	0.20	660	EGHA100E□□681MJ16S
	1,000	10×20	0.20	820	EGHA100E□□102MJ20S
	2,200	12.5×20	0.22	1,000	EGHA100E□□222MK20S
	3,300	12.5×30	0.24	1,280	EGHA100E□□332MK30S
16	220	8×12	0.16	270	EGHA160E□□221MH12D
	330	8×12	0.16	270	EGHA160E□□331MH12D
	330	10×12.5	0.16	510	EGHA160E□□331MJC5S
	470	10×16	0.16	660	EGHA160E□□471MJ16S
	560	10×16	0.16	660	EGHA160E□□561MJ16S
	680	10×20	0.16	820	EGHA160E□□681MJ20S
	1,000	12.5×20	0.16	1,000	EGHA160E□□102MK20S
	2,200	12.5×25	0.18	1,200	EGHA160E□□222MK25S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/ 150℃,100kHz)	Part No.
25	100	8×12	0.14	270	EGHA250E□□101MH12D
	220	10×12.5	0.14	510	EGHA250E□□221MJC5S
	330	10×16	0.14	660	EGHA250E□□331MJ16S
	470	10×20	0.14	820	EGHA250E□□471MJ20S
	560	10×20	0.14	820	EGHA250E□□561MJ20S
	680	12.5×20	0.14	1,000	EGHA250E□□681MK20S
	1,000	12.5×25	0.14	1,200	EGHA250E□□102MK25S
35	68	8×12	0.12	210	EGHA350E□□680MH12D
	100	8×12	0.12	210	EGHA350E□□101MH12D
	100	10×12.5	0.12	510	EGHA350E□□101MJC5S
	220	10×16	0.12	660	EGHA350E□□221MJ16S
	330	10×20	0.12	820	EGHA350E□□331MJ20S
	470	12.5×20	0.12	1,000	EGHA350E□□471MK20S
	560	12.5×20	0.12	1,000	EGHA350E□□561MK20S
	680	12.5×25	0.12	1,200	EGHA350E□□681MK25S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
68 to 100	0.40	0.75	0.90	1.00
220 to 560	0.50	0.85	0.94	1.00
680 to 1,000	0.60	0.87	0.95	1.00
2,200 to 3,300	0.75	0.90	0.95	1.00

As for influence of aluminum electrolytic capacitors on life, the internal heating produced by ripple current is greater than the ambient temperature.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

For airbag module, 105℃

LBG Series

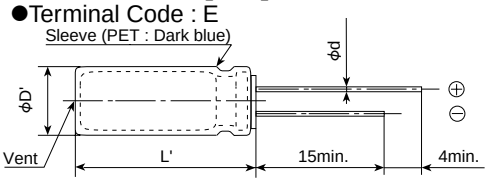
- For airbag application
- High capacitance, low impedance, and good low temperature behavior
- Endurance with ripple current : 5,000 hours at 105℃
- Solvent-proof type (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

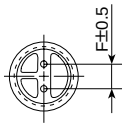
◆SPECIFICATIONS

Items	Characteristics			
Category Temperature Range	−55 to +105℃			
Rated Voltage Range	25 & 35Vdc			
Capacitance Range	1,000 to 11,000μF			(at 20℃, 120Hz)
Capacitance Tolerance	0 to +30% (A)			(at 20℃, 120Hz)
Leakage Current	I=0.01CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)			(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	25V	35V	
	tanδ (Max.)	0.20	0.16	
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase.			(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	25V	35V	
	Z(−55℃)/Z(+20℃)	3	3	
	Impedance at -40℃ and 20℃ 100kHz in the STANDARD RATINGS			(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 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 [mm]

●Terminal Code : E





Gas escape end seal

φD	12.5	14.5	16	18
φd	0.6	0.8	0.8	0.8
F	5.0	7.5	7.5	7.5
φD'	φD+0.5max.			
L'	L+1.5max.			

◆PART NUMBERING SYSTEM

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

- 18 : Supplement code
- 15–17 : Size code
- 14 : Capacitance tolerance code
- 11–13 : Capacitance code (ex. 820μF:821, 2,200μF:222)
- 9–10 : Lead forming·taping code
- 8 : Terminal code
- 5–7 : Voltage code (ex. 16V:160, 35V:350)
- 4 : Series code
- 1–3 : Category

Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

For airbag module, 105℃

LBG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Impedance (Ωmax/100kHz)		Rated ripple current (mArms/105℃,100kHz)	Part No.
			20℃	-40℃		
25	1,700	12.5×20	0.057	0.29	1,700	ELBG250E□□172AK20S
	2,400	12.5×25	0.045	0.23	2,000	ELBG250E□□242AK25S
	2,400	14.5×20	0.051	0.26	2,000	ELBG250E□□242AU20S
	2,800	12.5×30	0.039	0.20	2,300	ELBG250E□□282AK30S
	3,000	16×20	0.044	0.22	2,250	ELBG250E□□302AL20S
	3,400	14.5×25	0.041	0.21	2,400	ELBG250E□□342AU25S
	3,500	12.5×35	0.033	0.17	2,700	ELBG250E□□352AK35S
	4,200	16×25	0.033	0.17	2,600	ELBG250E□□422AL25S
	4,200	18×20	0.042	0.21	2,500	ELBG250E□□422AM20S
	4,500	12.5×40	0.027	0.14	3,100	ELBG250E□□452AK40S
	4,600	14.5×31.5	0.032	0.16	2,700	ELBG250E□□462AUN3S
	5,400	14.5×35.5	0.028	0.14	3,100	ELBG250E□□542AUP1S
	5,600	16×31.5	0.026	0.13	3,200	ELBG250E□□562ALN3S
	6,000	18×25	0.030	0.15	2,800	ELBG250E□□602AM25S
	6,400	14.5×40	0.025	0.13	3,400	ELBG250E□□642AU40S
	6,600	16×35.5	0.023	0.12	3,500	ELBG250E□□662ALP1S
	7,800	16×40	0.021	0.11	3,800	ELBG250E□□782AL40S
	7,900	18×31.5	0.024	0.12	3,500	ELBG250E□□792AMN3S
	9,200	18×35.5	0.022	0.11	3,700	ELBG250E□□922AMP1S
	11,000	18×40	0.020	0.10	4,000	ELBG250E□□113AM40S
35	1,000	12.5×20	0.057	0.29	1,700	ELBG350E□□102AK20S
	1,400	12.5×25	0.045	0.23	2,000	ELBG350E□□142AK25S
	1,400	14.5×20	0.051	0.26	2,000	ELBG350E□□142AU20S
	1,600	12.5×30	0.039	0.20	2,300	ELBG350E□□162AK30S
	1,800	16×20	0.044	0.22	2,250	ELBG350E□□182AL20S
	2,000	14.5×25	0.041	0.21	2,400	ELBG350E□□202AU25S
	2,100	12.5×35	0.033	0.17	2,700	ELBG350E□□212AK35S
	2,500	16×25	0.033	0.17	2,600	ELBG350E□□252AL25S
	2,500	18×20	0.042	0.21	2,500	ELBG350E□□252AM20S
	2,700	12.5×40	0.027	0.14	3,100	ELBG350E□□272AK40S
	2,800	14.5×31.5	0.032	0.16	2,700	ELBG350E□□282AUN3S
	3,200	14.5×35.5	0.028	0.14	3,100	ELBG350E□□322AUP1S
	3,400	16×31.5	0.026	0.13	3,200	ELBG350E□□342ALN3S
	3,600	18×25	0.030	0.15	2,800	ELBG350E□□362AM25S
	3,800	14.5×40	0.025	0.13	3,400	ELBG350E□□382AU40S
	4,000	16×35.5	0.023	0.12	3,500	ELBG350E□□402ALP1S
	4,700	16×40	0.021	0.11	3,800	ELBG350E□□472AL40S
	4,800	18×31.5	0.024	0.12	3,500	ELBG350E□□482AMN3S
	5,600	18×35.5	0.022	0.11	3,700	ELBG350E□□562AMP1S
	6,700	18×40	0.020	0.10	4,000	ELBG350E□□672AM40S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
1,000 to 2,000	0.60	0.87	0.95	1.00
2,100 to 3,800	0.75	0.90	0.95	1.00
4,000 to 11,000	0.85	0.95	0.98	1.00

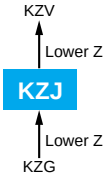
The endurance of capacitors is shorted with internal heating produced by ripple current at the rate of halving the lifetime with every 5℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

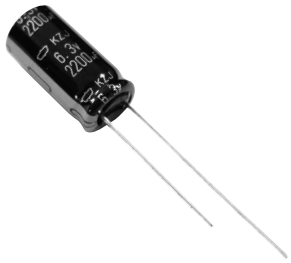
NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

For computer motherboard

KZJ Series





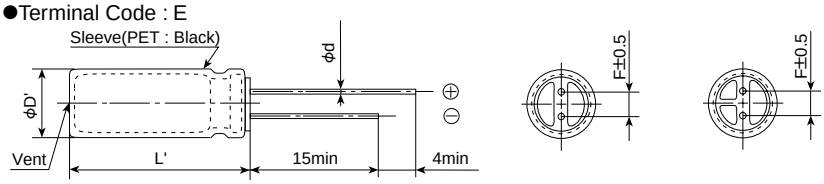
- Super low ESR/impedance capacitors due to very low resistivity electrolyte
- Rated voltage range : 6.3 to 16V, Nominal capacitance range : 470 to 3,300µF
- Endurance with ripple current : 2,000 hours at 105℃
- The KZJ series capacitors are designed for computer motherboards
- Non solvent-proof
- **RoHS Compliant**

◆SPECIFICATIONS

Items	Characteristics				
Category Temperature Range	−40 to +105℃				
Rated Voltage Range	6.3 to 16Vdc				
Capacitance Tolerance	±20% (M)				(at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3µA, whichever is greater. Where, I : Max. leakage current (µA), C : Nominal capacitance (µF), V : Rated voltage (Vdc)				(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	
	tanδ (Max.)	0.22	0.19	0.16	
	When nominal capacitance exceeds 1,000µF, add 0.02 to the value above for each 1,000µF increase.				(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	6.3V	10V	16V	
	Z (-25℃) / Z (+20℃)	2	2	2	
	Z (-40℃) / Z (+20℃)	3	3	3	(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 for 2,000 hours at 105℃.				
	Capacitance change	≦±25% of the initial measured 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	≦±25% of the initial measured value			
	D.F. (tanδ)	≦200% of the initial specified value			
	Leakage current	≦The initial specified value			

◆DIMENSIONS [mm]

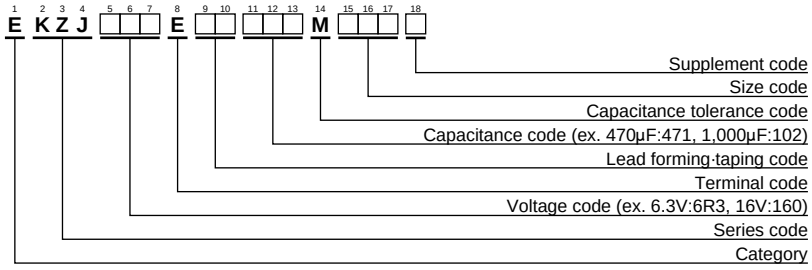
- Terminal Code : E



Gas escaped end seal

φD	8	10	12.5
φd	0.6	0.6	0.6
F	3.5	5.0	5.0
φD'	φD+0.5max.		
L'	L+1.5max.		

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

For computer motherboard

KZJ Series

◆STANDARD RATINGS

WV(Vdc)	Cap(μF)	Case size φD×L(mm)	Impedance (Ωmax/20℃, 100kHz)	Rated ripple current (mArms/105℃, 100kHz)	Part No.
6.3	1,000	8×11.5	0.021	1,310	EKZJ6R3E□□102MHB5D
	1,200	8×15	0.018	1,850	EKZJ6R3E□□122MH15D
	1,500	8×20	0.012	2,350	EKZJ6R3E□□152MH20D
	1,500	10×12.5	0.018	1,960	EKZJ6R3E□□152MJC5S
	1,800	8×20	0.012	2,350	EKZJ6R3E□□182MH20D
	1,800	10×16	0.0125	2,460	EKZJ6R3E□□182MJ16S
	2,200	8×20	0.012	2,350	EKZJ6R3E□□222MH20D
	2,200	8×25	0.011	2,710	EKZJ6R3E□□222MH25D
	2,200	10×16	0.0125	2,460	EKZJ6R3E□□222MJ16S
	2,200	10×20	0.011	2,920	EKZJ6R3E□□222MJ20S
	2,700	10×20	0.011	2,920	EKZJ6R3E□□272MJ20S
	3,300	10×25	0.009	3,230	EKZJ6R3E□□332MJ25S
10	680	8×11.5	0.021	1,310	EKZJ100E□□681MHB5D
	1,000	8×15	0.018	1,850	EKZJ100E□□102MH15D
	1,000	10×12.5	0.018	1,960	EKZJ100E□□102MJC5S
	1,500	8×20	0.012	2,350	EKZJ100E□□152MH20D
	1,500	8×25	0.011	2,710	EKZJ100E□□152MH25D
	1,500	10×16	0.0125	2,460	EKZJ100E□□152MJ16S
	1,800	10×20	0.011	2,920	EKZJ100E□□182MJ20S
	2,200	10×25	0.009	3,230	EKZJ100E□□222MJ25S
16	470	8×11.5	0.021	1,310	EKZJ160E□□471MHB5D
	680	8×15	0.018	1,850	EKZJ160E□□681MH15D
	680	10×12.5	0.018	1,960	EKZJ160E□□681MJC5S
	1,000	8×20	0.012	2,350	EKZJ160E□□102MH20D
	1,000	8×25	0.011	2,710	EKZJ160E□□102MH25D
	1,000	10×16	0.0125	2,460	EKZJ160E□□102MJ16S
	1,500	10×20	0.011	2,920	EKZJ160E□□152MJ20S
	1,800	10×25	0.009	3,230	EKZJ160E□□182MJ25S
	2,200	12.5×20	0.009	3,220	EKZJ160E□□222MK20S
	2,700	12.5×25	0.008	3,370	EKZJ160E□□272MK25S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance(μF) \ Frequency (Hz)	120	1k	10k	100k
470	0.50	0.85	0.94	1.00
680 to 1,800	0.60	0.87	0.95	1.00
2,200 to 3,300	0.75	0.90	0.95	1.00

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

For computer motherboard

KZG Series

KZV ↑ Lower Z
KZJ ↑ Lower Z
KZG

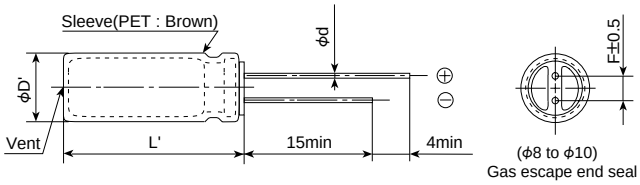
- Super low ESR/impedance capacitors due to very low resistivity electrolyte
- Rated voltage range : 6.3 to 16V, Nominal capacitance range : 470 to 3,300μF
- Endurance with ripple current : 2,000 hours at 105℃
- The KZG series capacitors are designed for computer motherboards
- Non solvent-proof
- **RoHS Compliant**

◆SPECIFICATIONS

Items	Characteristics				
Category Temperature Range	−40 to +105℃				
Rated Voltage Range	6.3 to 16Vdc				
Capacitance Tolerance	±20% (M)				(at 20℃, 120Hz)
Leakage Current	I=0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (Vdc)				(at 20℃ after 2 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	6.3V	10V	16V	
	tanδ (Max.)	0.22	0.19	0.16	
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase.				(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	6.3V	10V	16V	
	Z (-25℃) / Z (+20℃)	2	2	2	
	Z (-40℃) / Z (+20℃)	3	3	3	(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 for 2,000 hours at 105℃.				
	Capacitance change	≦±25% of the initial measured 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	≦±25% of the initial measured value			
	D.F. (tanδ)	≦200% of the initial specified value			
	Leakage current	≦The initial specified value			

◆DIMENSIONS [mm]

- Terminal Code : E



(φ8 to φ10)
Gas escape end seal

φD	8	10
φd	0.6	0.6
F	3.5	5.0
φD'	φD+0.5max.	
L'	L+1.5max.	

◆PART NUMBERING SYSTEM

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

Supplement code
Size code
Capacitance tolerance code
Capacitance code (ex. 470μF:471, 2,200μF:222)
Lead forming·taping code
Terminal code
Voltage code (ex. 6.3V:6R3,10V:100,16V:160)
Series code
Category

Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

For computer motherboard

KZG Series

◆STANDARD RATINGS

WV(Vdc)	Cap(μF)	Case size φD×L(mm)	Impedance (Ωmax/20℃, 100kHz)	Rated ripple current (mArms/105℃, 100kHz)	Part No.
6.3	820	8×11.5	0.036	1,140	EKZG6R3E□□821MHB5D
	1,200	8×15	0.028	1,490	EKZG6R3E□□122MH15D
	1,500	10×12.5	0.026	1,540	EKZG6R3E□□152MJC5S
	1,800	8×20	0.021	1,870	EKZG6R3E□□182MH20D
	1,800	10×16	0.019	2,000	EKZG6R3E□□182MJ16S
	2,200	10×20	0.013	2,550	EKZG6R3E□□222MJ20S
	3,300	10×25	0.012	2,800	EKZG6R3E□□332MJ25S
10	680	8×11.5	0.036	1,140	EKZG100E□□681MHB5D
	1,000	8×15	0.028	1,490	EKZG100E□□102MH15D
	1,000	10×12.5	0.026	1,540	EKZG100E□□102MJC5S
	1,500	8×20	0.021	1,870	EKZG100E□□152MH20D
	1,500	10×16	0.019	2,000	EKZG100E□□152MJ16S
	1,800	10×20	0.013	2,550	EKZG100E□□182MJ20S
	2,200	10×25	0.012	2,800	EKZG100E□□222MJ25S
16	470	8×11.5	0.036	1,140	EKZG160E□□471MHB5D
	680	8×15	0.028	1,490	EKZG160E□□681MH15D
	680	10×12.5	0.026	1,540	EKZG160E□□681MJC5S
	1,000	8×20	0.021	1,870	EKZG160E□□102MH20D
	1,000	10×16	0.019	2,000	EKZG160E□□102MJ16S
	1,500	10×20	0.013	2,550	EKZG160E□□152MJ20S
	1,800	10×25	0.012	2,800	EKZG160E□□182MJ25S

□□ : Fill with appropriate lead forming or taping code.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance(μF) \ Frequency (Hz)	120	1k	10k	100k
470	0.50	0.85	0.94	1.00
680 to 1,800	0.60	0.87	0.95	1.00
2,200 to 3,300	0.75	0.90	0.95	1.00

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

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low leakage current, 85℃

LLA Series

- Endurance : 1,000 hours at 85℃
- Solvent-proof (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

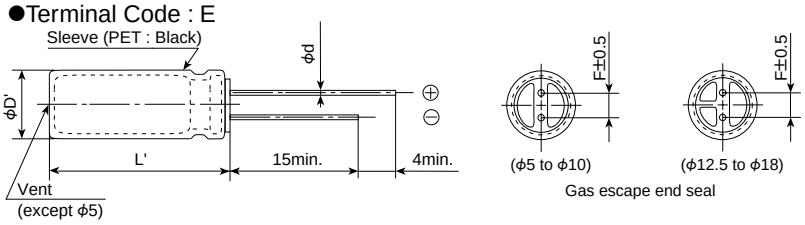
LLA
Lower LC
SME

◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−40 to +85℃
Rated Voltage Range	6.3 to 50Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.002CV or 0.2μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 1 minute)
Dissipation Factor (tanδ)	Rated voltage (Vdc) 6.3V 10V 16V 25V 35V 50V tanδ (Max.) 0.24 0.20 0.16 0.14 0.12 0.10 When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)
Low Temperature Characteristics	○Leakage current Leakage current at 85℃ : ≦10 times of the 20℃ specified value ○Max. Impedance Ratio (at 120Hz) Z(−25℃)/Z(+20℃)≦4, Z(−40℃)/Z(+20℃)≦8
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 1,000 hours at 85℃. Capacitance change: ≦±20% of the initial value D.F. (tanδ): ≦150% of the initial specified value Leakage current: ≦The initial specified value
Shelf Life	The same specifications as "Endurance" shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 85℃ without voltage applied.
Shelf Test	The following specifications shall be satisfied when the capacitors are restored to 20℃ after leaving them for 6 months at a nominal temperature (-10 to +40℃) 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

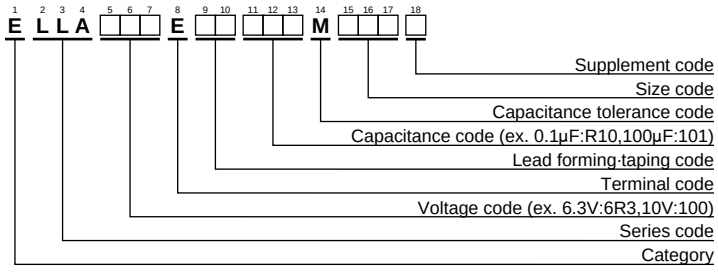
◆DIMENSIONS [mm]

●Terminal Code : E



φD	5	6.3	8	10	12.5	16	18
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φD'	φD+0.5max.						
L'	L+1.5max.						

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

CAT. No. E1001G

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low leakage current, 85℃

LLA Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
6.3	33	5×11	0.24	55	ELLA6R3E□□330ME11D
	47	5×11	0.24	79	ELLA6R3E□□470ME11D
	100	5×11	0.24	130	ELLA6R3E□□101ME11D
	220	6.3×11	0.24	230	ELLA6R3E□□221MF11D
	330	6.3×11	0.24	280	ELLA6R3E□□331MF11D
	470	8×11.5	0.24	380	ELLA6R3E□□471MHB5D
	1,000	10×12.5	0.24	650	ELLA6R3E□□102MJC5S
	2,200	12.5×20	0.26	1,150	ELLA6R3E□□222MK20S
	3,300	12.5×20	0.28	1,380	ELLA6R3E□□332MK20S
	4,700	16×25	0.30	1,880	ELLA6R3E□□472ML25S
	6,800	16×25	0.34	2,120	ELLA6R3E□□682ML25S
	10,000	16×31.5	0.42	2,500	ELLA6R3E□□103MLN3S
	15,000	18×35.5	0.52	2,990	ELLA6R3E□□153MMP1S
10	22	5×11	0.20	59	ELLA100E□□220ME11D
	33	5×11	0.20	84	ELLA100E□□330ME11D
	47	5×11	0.20	100	ELLA100E□□470ME11D
	100	5×11	0.20	145	ELLA100E□□101ME11D
	220	6.3×11	0.20	250	ELLA100E□□221MF11D
	330	8×11.5	0.20	350	ELLA100E□□331MHB5D
	470	8×11.5	0.20	415	ELLA100E□□471MHB5D
	1,000	10×16	0.20	790	ELLA100E□□102MJ16S
	2,200	12.5×20	0.22	1,240	ELLA100E□□222MK20S
	3,300	12.5×25	0.24	1,590	ELLA100E□□332MK25S
	4,700	16×25	0.26	1,980	ELLA100E□□472ML25S
	6,800	16×31.5	0.30	2,390	ELLA100E□□682MLN3S
	10,000	18×35.5	0.38	2,840	ELLA100E□□103MMP1S
16	10	5×11	0.16	44	ELLA160E□□100ME11D
	22	5×11	0.16	75	ELLA160E□□220ME11D
	33	5×11	0.16	90	ELLA160E□□330ME11D
	47	5×11	0.16	110	ELLA160E□□470ME11D
	100	6.3×11	0.16	180	ELLA160E□□101MF11D
	220	8×11.5	0.16	300	ELLA160E□□221MHB5D
	330	8×11.5	0.16	370	ELLA160E□□331MHB5D
	470	10×12.5	0.16	520	ELLA160E□□471MJC5S
	1,000	10×20	0.16	910	ELLA160E□□102MJ20S
	2,200	12.5×25	0.18	1,420	ELLA160E□□222MK25S
	3,300	16×25	0.20	1,840	ELLA160E□□332ML25S
	4,700	16×31.5	0.22	2,260	ELLA160E□□472MLN3S
	6,800	18×35.5	0.26	2,690	ELLA160E□□682MMP1S
	10,000	18×40	0.34	2,920	ELLA160E□□103MM40S
25	4.7	5×11	0.14	31	ELLA250E□□4R7ME11D
	10	5×11	0.14	54	ELLA250E□□100ME11D
	22	5×11	0.14	80	ELLA250E□□220ME11D

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
25	33	5×11	0.14	97	ELLA250E□□330ME11D
	47	5×11	0.14	115	ELLA250E□□470ME11D
	100	6.3×11	0.14	190	ELLA250E□□101MF11D
	220	8×11.5	0.14	320	ELLA250E□□221MHB5D
	330	10×12.5	0.14	470	ELLA250E□□331MJC5S
	470	10×16	0.14	620	ELLA250E□□471MJ16S
	1,000	12.5×20	0.14	1,090	ELLA250E□□102MK20S
	2,200	16×25	0.16	1,660	ELLA250E□□222ML25S
	3,300	16×31.5	0.18	2,070	ELLA250E□□332MLN3S
	4,700	18×35.5	0.20	2,520	ELLA250E□□472MMP1S
	6,800	18×40	0.24	2,830	ELLA250E□□682MM40S
35	4.7	5×11	0.12	40	ELLA350E□□4R7ME11D
	10	5×11	0.12	58	ELLA350E□□100ME11D
	22	5×11	0.12	87	ELLA350E□□220ME11D
	33	5×11	0.12	105	ELLA350E□□330ME11D
	47	6.3×11	0.12	145	ELLA350E□□470MF11D
	100	8×11.5	0.12	240	ELLA350E□□101MHB5D
	220	10×12.5	0.12	420	ELLA350E□□221MJC5S
	330	10×16	0.12	570	ELLA350E□□331MJ16S
	470	10×20	0.12	740	ELLA350E□□471MJ20S
	1,000	12.5×25	0.12	1,300	ELLA350E□□102MK25S
	2,200	16×31.5	0.14	1,890	ELLA350E□□222MLN3S
	3,300	18×35.5	0.16	2,340	ELLA350E□□332MMP1S
	4,700	18×40	0.18	2,690	ELLA350E□□472MM40S
50	0.10	5×11	0.10	1.3	ELLA500E□□R10ME11D
	0.22	5×11	0.10	2.9	ELLA500E□□R22ME11D
	0.33	5×11	0.10	4.4	ELLA500E□□R33ME11D
	0.47	5×11	0.10	11	ELLA500E□□R47ME11D
	1.0	5×11	0.10	17	ELLA500E□□1R0ME11D
	2.2	5×11	0.10	25	ELLA500E□□2R2ME11D
	3.3	5×11	0.10	35	ELLA500E□□3R3ME11D
	4.7	5×11	0.10	42	ELLA500E□□4R7ME11D
	10	5×11	0.10	65	ELLA500E□□100ME11D
	22	5×11	0.10	95	ELLA500E□□220ME11D
	33	6.3×11	0.10	125	ELLA500E□□330MF11D
	47	6.3×11	0.10	150	ELLA500E□□470MF11D
	100	8×11.5	0.10	255	ELLA500E□□101MHB5D
	220	10×16	0.10	490	ELLA500E□□221MJ16S
	330	10×20	0.10	650	ELLA500E□□331MJ20S
	470	12.5×20	0.10	860	ELLA500E□□471MK20S
	1,000	16×25	0.10	1,530	ELLA500E□□102ML25S
	2,200	18×35.5	0.12	2,160	ELLA500E□□222MMP1S

□□ : Fill with appropriate lead forming or taping code.

NIPPON CHEMI-CON

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

For strobe flash

PH Series

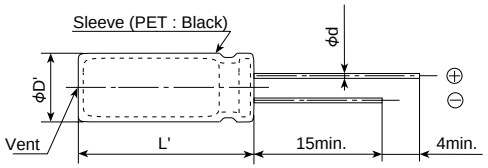
●RoHS Compliant

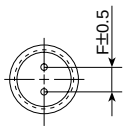
◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−20 to +55℃
Rated Voltage Range	300 & 330Vdc
Capacitance Tolerance	−10 to +20% (V) (at 20℃, 120Hz)
Leakage Current	I=1×C Where, I : Max. leakage current (μA), C : Nominal capacitance (μF) (at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	0.06max. (at 20℃, 120Hz)
Charge and Discharge Characteristics	The following specifications shall be satisfied when the capacitors are restored to 20℃ after charge and discharge are repeated 5,000 times at room temperature (5 to 35℃). Discharge resistance or Xenon tube : 0.7 to 1.0Ω. Capacitance change: ≦±10% of the initial value D.F. (tanδ): ≦150% of the initial specified value Leakage current: ≦150% of 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 55℃ without voltage applied. Capacitance change: ≦±10% of the initial value D.F. (tanδ): ≦150% of the initial specified value Leakage current: ≦150% of the initial specified value

◆DIMENSIONS [mm]

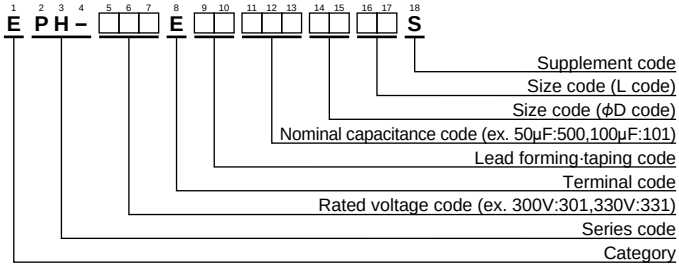
●Terminal Code : E





φD	6.0 to 7.5	8.0 to 8.5	9.0 to 9.5	10.0 to 14.0	14.5 to 18
φd	0.5	0.6	0.6	0.6	0.8
F	2.5	3.5	4	5	7.5
φD'	φD+0.5max.				
L'	L+1.0max.				

◆PART NUMBERING SYSTEM



Please refer to "A guide to global code (radial lead type)"

●Size Code

φD code (14th, 15th)

φD(mm)	φD code 14th	φD code 15th
6.0	6	0
6.5	6	5
7.0	7	0
7.5	7	5
8.0	8	0
8.5	8	5
9.0	9	0
9.5	9	5
10.0	A	0
10.5	A	5
11.0	B	0
11.5	B	5
12.0	C	0
12.5	C	5
13.0	D	0
13.5	D	5
14.0	E	0
14.5	E	5
15.0	F	0
15.5	F	5
16.0	G	0
16.5	G	5
17.0	H	0
17.5	H	5
18.0	J	0

L code (16th, 17th)

L(mm)	L code 16th	L code 17th
15.0	1	5
16.0	1	6
17.0	1	7
18.0	1	8
19.0	1	9
20.0	2	0
21.0	2	1
22.0	2	2
23.0	2	3
24.0	2	4
25.0	2	5
26.0	2	6
27.0	2	7
28.0	2	8
29.0	2	9
30.0	3	0
31.0	3	1
32.0	3	2
33.0	3	3
34.0	3	4
35.0	3	5
36.0	3	6
37.0	3	7
38.0	3	8
39.0	3	9
40.0	4	0
41.0	4	1
42.0	4	2
43.0	4	3
44.0	4	4
45.0	4	5

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