NIPPON CHEMI-CON

SNAP-IN TYPE ALUMINUM ELECTROLYTIC CAPACITORS

CAT. No. E1001H (Ver.2)

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CAPACITOR SERIES TABLE, CONTENTS

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Series			Features	Endurance (+R=With ripple)	Standard type	Low impedance	Solvent resistant	Terminal type	Rated voltage range (Vdc)	Capacitance range (μF)
Conductive Polymer Electrolyte Type		PXF	Vertical type, super low ESR	105℃ 2,000 hours		●	●	SMD	2.5 to 6.3	220 to 1,000
		PXE	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 Upgrade!	Super low ESR, high ripple current	105℃ 2,000 hours		●	●	Radial	2.5 to 16	47 to 1,500
		PS Upgrade!	Radial lead type, super low ESR	105℃ 2,000 hours	●	●	●	Radial	2.5 to 35	18 to 1,500
		PSL NEW!	Low ESL (Ask Engineering Bulletin No791 in detail)	105℃ 2,000 hours		●	●	Radial	2.5	560
Miniature 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 (Ask Engineering Bulletin No704 in detail)	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
		MZE NEW!	105℃7,000/8,000 hours, low impedance, long life	105℃ 7,000 to 8,000 hours		●	●	SMD	6.3 to 50	10 to 470
		MZD	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
		MLE NEW!	105℃7,000/8,000 hours, long life	105℃ 7,000 to 8,000 hours			●	SMD	6.3 to 50	0.1 to 1,000
		MLD	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	125℃ 2,000 hours			●	SMD	10 to 35	47 to 470
		MKB	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-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

: Promotional products

▲ : Some of range are solvent resistant.

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CAPACITOR SERIES TABLE, CONTENTS

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Series			Features	Endurance (+R=With ripple)	Standard type	Low impedance	Solvent resistant	Terminal type	Rated voltage range (Vdc)	Capacitance range (μF)
Miniature	High Reliability	KXJ	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
		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 hours +R			●	Radial	10 to 50	100 to 1,000
	Special Application	LBG	For airbag	105℃ 5,000 hours +R		●	●	Radial	25 & 35	1,000 to 11,000
		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	—
Snap-in	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	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	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	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
		KMV (NEW!)	For charge and discharge application (Ask Engineering Bulletin No781 in detail)	105℃ 3,000 hours +R				Pin	350 to 450	82 to 1,200
Screw-mount	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
		RWV (NEW!)	For charge and discharge application (Ask Engineering Bulletin No782 in detail)	85℃ 5,000 hours +R				Screw	350 to 450	820 to 18,000

: Promotional products

▲ : Some of range are solvent resistant.

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CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

◆SURFACE MOUNT

Vertical SMD

Upgrade! PXA → (Lower ESR) PXE → (Lower ESR) PXF

High Temperature

PXH

Digitalization Super Low ESR

◆RADIAL LEAD

Radial type

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

PS → (Lower ESL) NEW! PSL

Digitalization Super Low ESR

ALUMINUM ELECTROLYTIC CAPACITORS

◆SURFACE MOUNT

SURFACE MOUNT (Vertical)

MV 85℃

MVK / MKA 105℃

Downsized & Low Profile

MVA 85℃ High CV

MVE 105℃ High CV

MVS 4.5mmL

Low Impedance

MLA 105℃ 3,000H → (Longer life) MZD 105℃ 5,000H → (Longer life) NEW! MZE 105℃ 7,000/8,000H

MVY 105℃ → (Longer life) MLA

MVY 105℃ → (Lower Z) MZA 105℃ 2,000H P74

Digitalization

Large size (φ12.5 to φ18)

MVA 85℃ High CV

MVE 105℃ High CV

MVY 105℃ Low Z

MVH 125℃

105℃ Long Life

MVJ 2,000H → (Longer life) MVL 3,000/5,000H → (Longer life) MLD 5,000H → (Longer life) NEW! MLE 7,000/8,000H

MKB 3,000H

High Temperature

NEW! MHB 125℃

MVH 125℃

Automotive Application

◆RADIAL LEAD

5mmL

SRM 85℃ → (High CV) SRE 85℃

KRE 105℃

7mmL & Low Profile

SRG 85℃ → (High CV) SRA 85℃

KRG 105℃

KMA 105℃

Low Profile

105℃ Low Impedance

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

Power Supply Output Filter

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 → KXJ 10,000/12,000H

Downsized

Adapter/ Ballast

For Strobe

PH

For Motherboard

KZG

Low LC

LLA 85℃

Long Life

FL 3,000H

High Temperature (125℃)

GXE 2,000 to 5,000H

GXL 5,000H

GPA 3,000/5,000H

Automotive Application

For Airbag

LBG

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GROUP CHART

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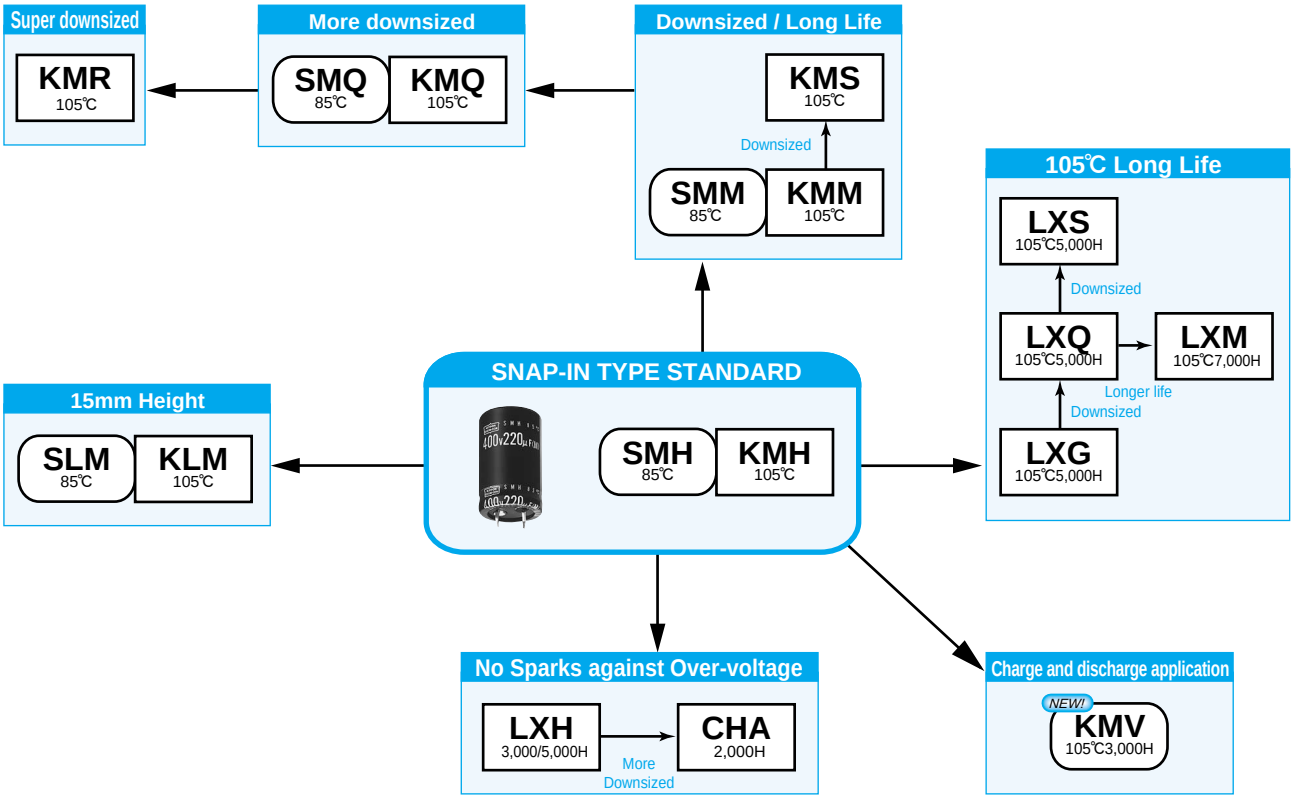
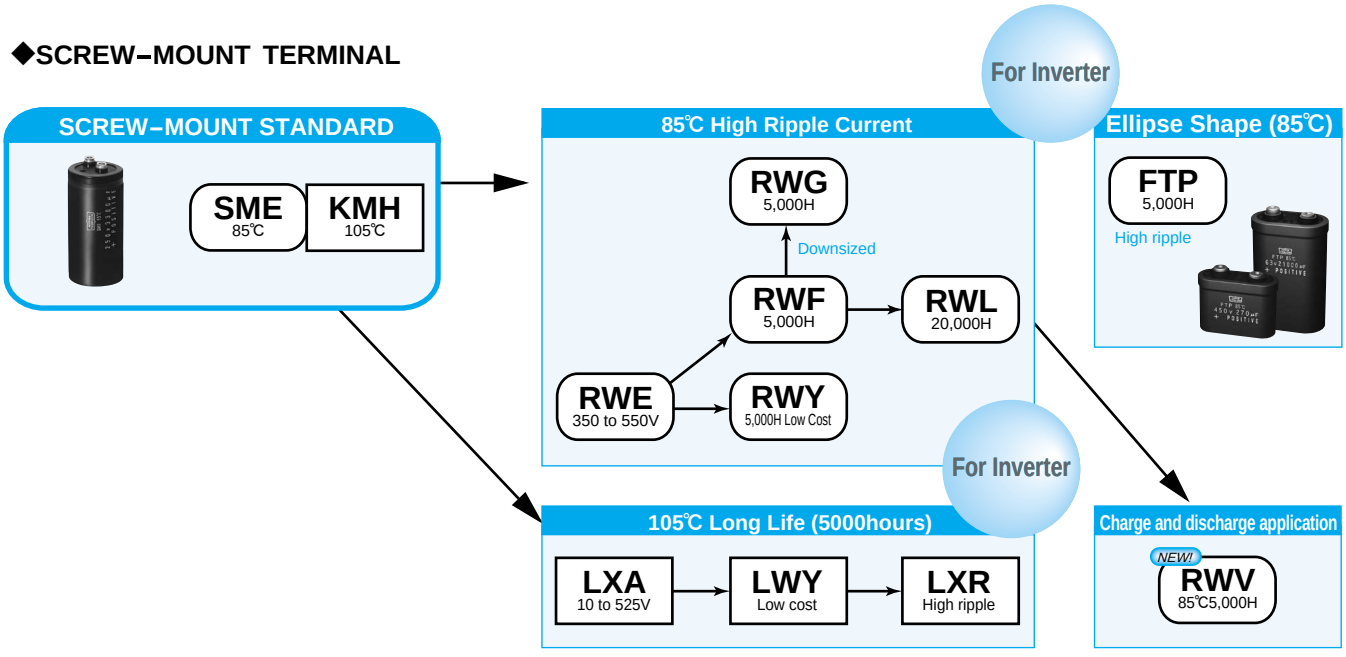
ALUMINUM ELECTROLYTIC CAPACITORS

◆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 on Aluminum Electrolytic Capacitor Life.

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 the 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.

10 Condition

Do not use/expose capacitors to the following conditions.
a) Oil, water, salty water 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 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 tighten 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 with 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 boards

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 and terpene system solvents; cause the rubber seal material to deteriorate.
- Xylene; causes the rubber seal material to deteriorate.
- Acetone; erases the marking.

Solvent resistant 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-14,15,16,17 (Momentive performance materials)
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 resistant capacitors are capable of withstanding any one of immersion, ultrasonic or vapor cleaning for 5 minutes; ex-ception 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, turn off 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).

Disposal

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

Catalogs

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

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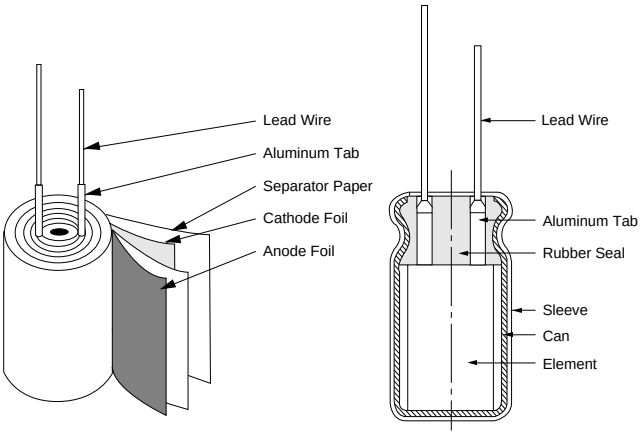
Structure of Aluminum Electrolytic Capacitors

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



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

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

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

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

Primary of Composition Material

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

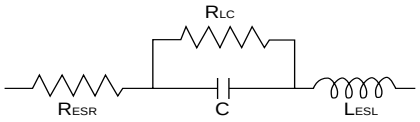
Cathode aluminum foil:
As in the first manufacturing process of the positive foil, the cathode foil requires etching process. Generally, it does not require the formation process; therefore, the natural oxide layer of Al_2O_3, which gives a characteristic dielectric voltage of 1.0 volts, is formed.

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

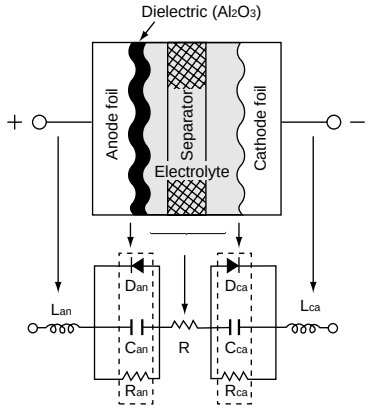
Can case and sealing materials:
The foils and separator are wound into a cylinder to make an internal element, which is impregnated with the electrolyte, inserted into an aluminum can case and sealed. During the service life of a capacitor, electrolyte slowly and naturally vaporizes by electrochemical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

The Equivalent Circuit

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



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



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

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

Basic Electrical Characteristics

Capacitance:
The capacitance of capacitor is expressed as AC capacitance

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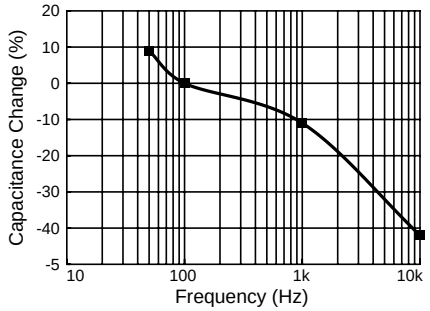
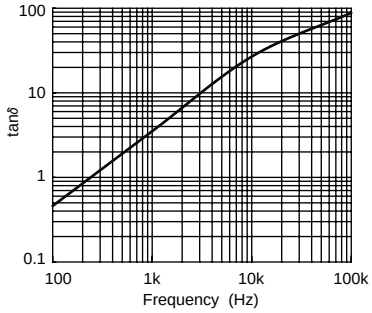
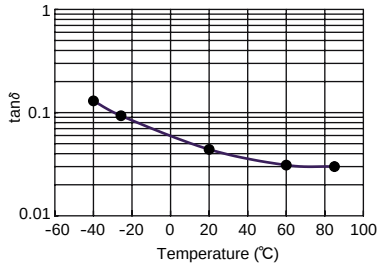
by measuring impedance and separating factors. Also, the AC capacitance depends upon frequency, voltage and other measuring methods. In fact, JIS C 5101 prescribes that the series capacitive factor of an equivalent series( ) circuit shall be the capacitance measured at a frequency of 120Hz and applying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



Capacitance VS. Frequency

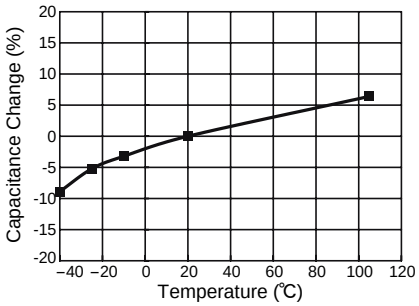


tanδ VS. Frequency



Temperature Characteristics of tanδ

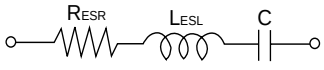
The capacitance value is highly dependent upon temperature and frequency. As the temperature decreases, the capacitance becomes smaller. See the typical behavior shown below.

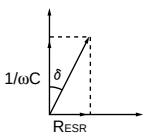


Temperature Characteristics of Capacitance

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

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





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

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

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

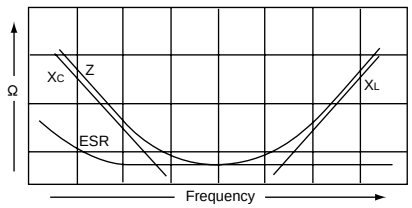
Equivalent series resistance (ESR):
The ESR is the series resistance consisting of the aluminum oxide layer, electrolyte/separator combination, and other resistance related factors, foil length, foil surface area and others.
The ESR value depends upon the temperature. Decreasing the temperature makes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

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

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

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

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



Impedance VS.Frequency

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

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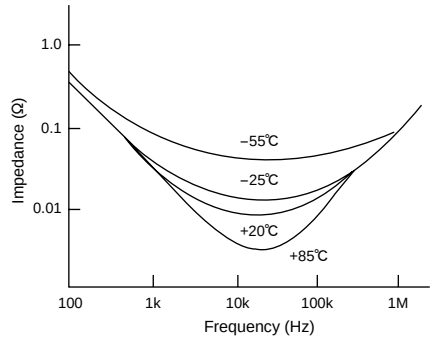
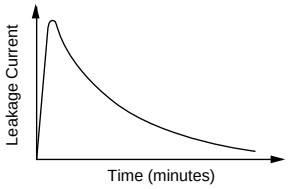


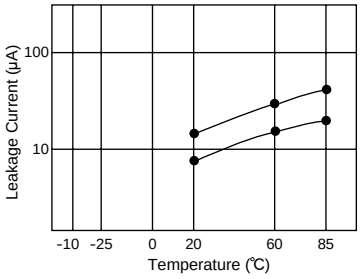
Temperature Characteristics of Impedance

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



Leakage Current VS. Time

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

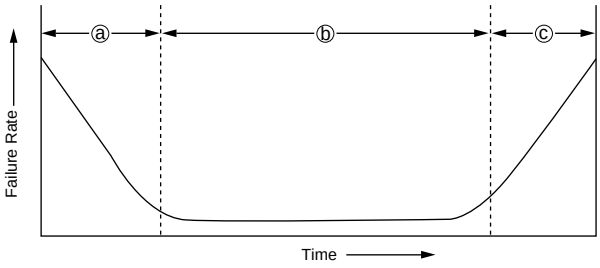


Typical Temperature Characteristics

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

Reliability

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



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

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

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

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

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

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

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

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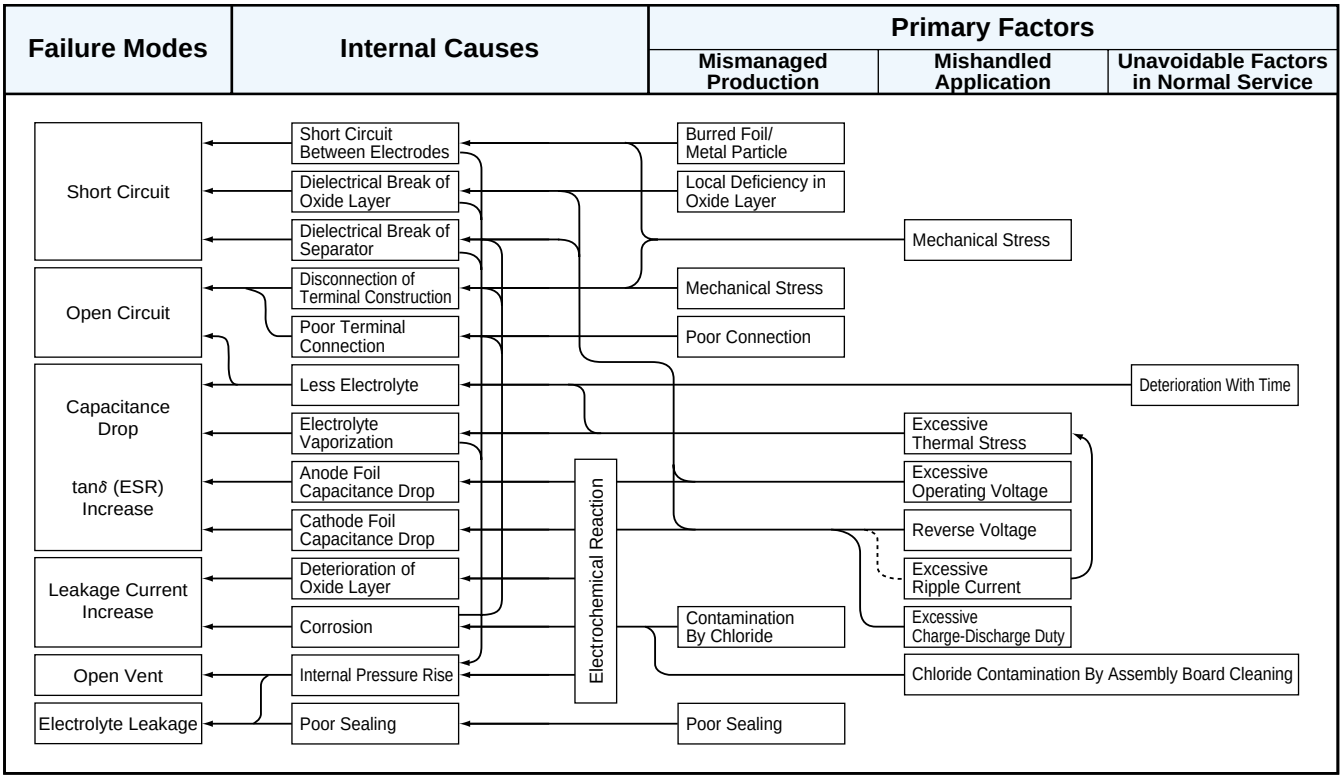

Table1

Life of Aluminum Electrolytic Capacitors

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

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

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

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

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

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

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

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

$K_{voltage}$ (Effects of applying voltage to life):
Miniature and large sized aluminum electrolytic capacitors for popular applications, such as surface mount types, radial lead types, snap-in types and block types, have little voltage effect on their life. Other factors like temperature and ripple current determine the life in comparison with voltage, as long as the capacitors are used at voltages and temperatures within the specifications prescribed in the catalog. Consequently, $K_{voltage}$=1 is used for these capacitors. 350V and higher screw-mount terminal types of capacitors for customer-use power electronics applications allow the life time to extend by applying low voltage, relating to the characteristics of their aluminum oxide layer. KMH, RWG, RWF, RWE, RWY, RWL and LXA 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	Products Series
$2^{(-\Delta T/5)}$		Surface Mount	MVS MVA MV MVE MVK MKA MZA MVY MZE MZD MLA MVJ MLE MLD MVL MVH MHB MKB MV-BP MVK-BP
		Radial	SRM SRE KRE SRA KMA SRG KRG SMQ SMG SME-BP KME-BP LLA
$2^{(\Delta T_0-\Delta T)/5}$	ΔT_0=5 deg Contact us for details	Radial	KMQ KMG KZM KZH KZE KY LXZ LXY LXV KXJ KXG KMH PAG KLJ KLG FL GPA GXE GXL LBG KZG
		Snap-in	KMR KMQ KMS KMM KMH KLM LXM LXS LXQ LXG CHA LXH
		Screw-Mount (Less than 350Vdc)	KMH LXA
	ΔT_0=5 to 10 deg Contact us for details	Radial	SMH
		Snap-in	SMQ SMM SMH SLM
		Screw-Mount	SME
$2^{(-2+(25-\Delta T)/b)}$		Screw-Mount (350Vdc and higher)	RWG RWF RWE RWY RWL LXA

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.
ΔT_0 = 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.

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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 shrinking or swelling.
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 resistant 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 resistant 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 resistant products):

Surface mount : PXF, PXE, PXH, MVS, MVA(4 to 63Vdc), MV, MVE(6.3 to 63Vdc), MVK, MKA, MZA, MVY(6.3 to 63Vdc), MZE, MZD, MLA, MVJ, MLE, MLD, MVL, MVH(10 to 50Vdc), MHB, MV-BP, MVK-BP

Radial lead : PSC, PSA, PS, SRM, KRE, KMA, SRG, KRG, KMQ(6.3 to 100Vdc), SMG(6.3 to 250Vdc), KMG(6.3 to 250Vdc), SME-BP, KME-BP, LXZ, LXY, LXV, GPA, GXE(10 to 50Vdc), GXL, LLA

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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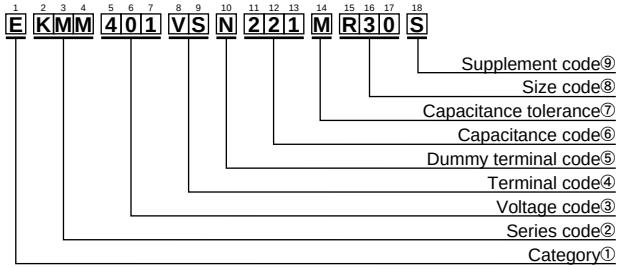
PART NUMBERING SYSTEM

Product code guide (Snap-in type)

(Example : KMM series, 400V-220μF, ϕ30×30L)

Please refer to the following table



①Category

Type	Code
	1st
Polar	E

②Series code

Series name	Code		
	2nd	3rd	4th
KMM	K	M	M
No series name	C	S	T

③Voltage code

Voltage (V)	Code		
	5th	6th	7th
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
180	1	8	1
200	2	0	1
220	2	2	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	9th
VS	V	S
LI	L	I
LR	L	R
LC	L	C
VR	V	R

⑤Dummy terminal code

Terminal #	Code
	10th
0	N
1	S
2	D
3	T

⑥Capacitance code

Cap. (μF)	Code		
	11th	12th	13th
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
100,000	1	0	4
220,000	2	2	4
330,000	3	3	4
470,000	4	7	4
680,000	6	8	4

⑦Capacitance tolerance

Tol. (%)	Code
	14th
±20	M

⑧Size code

ϕD	Code
	15th
20	N
22	P
25.4	Q
30	R
35	A
Others	S

L	Code	
	16th	17th
15	1	5
20	2	0
25	2	5
30	3	0
35	3	5
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
Pb-free PVC		M

* Refer to the appendix (Part number) for codes not listed here.

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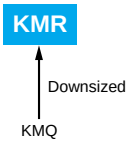
NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMR Series



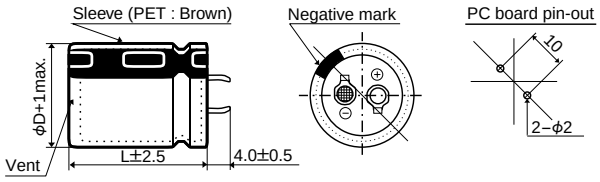
- Downsized 5mm in height from current snap-ins KMQ series
- Max. 50% up ripple current than same case size of KMQ series
- Endurance with ripple current : 2,000 hours at 105℃
- Rated voltage range : 160 to 450Vdc, Capacitance range : 100 to 3,900μF
- For inverter control, switching power supplies
- Non solvent resistant type
- **RoHS Compliant**

◆SPECIFICATIONS

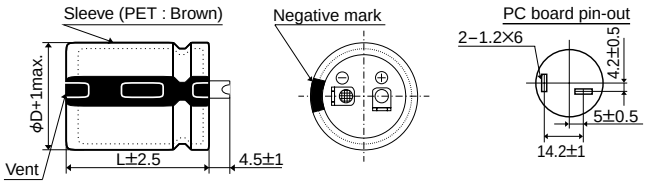
Items	Characteristics			
Category Temperature Range	−25 to +105℃			
Rated Voltage Range	160 to 450Vdc			
Capacitance Tolerance	±20% (M)			(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)			(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 250V	315 to 400V	420 & 450V
	tanδ (Max.)	0.15	0.15	0.20 (at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 250V	315 to 400V	420 & 450V
	Z(−25℃)/Z(+20℃)	4	8	8 (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 1000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.			
	Capacitance change	≦±15% of the initial value		
	D.F. (tanδ)	≦150% of the initial specified value		
	Leakage current	≦The initial specified value		

◆DIMENSIONS [mm]

●Terminal Code : VS (φ22 to φ35) : Standard

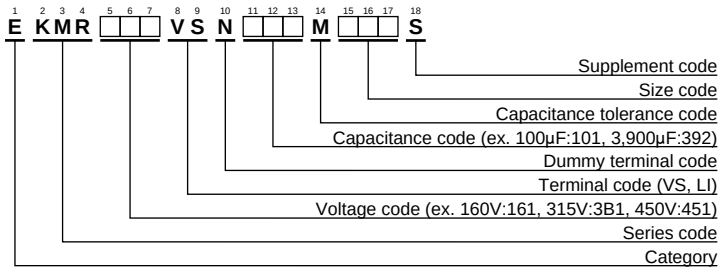


●Terminal Code : LI (φ35)



The standard design has no plastic disc.

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMR Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Rated ripple current (Arms/105℃,120Hz)	Part No.
160	560	22×25	1.58	EKMR161VSN561MP25S
	680	22×30	1.83	EKMR161VSN681MP30S
	820	22×35	2.06	EKMR161VSN821MP35S
	820	25.4×25	1.89	EKMR161VSN821MQ25S
	1,000	22×40	2.33	EKMR161VSN102MP40S
	1,000	25.4×30	2.15	EKMR161VSN102MQ30S
	1,000	30×25	1.90	EKMR161VSN102MR25S
	1,200	22×45	2.61	EKMR161VSN122MP45S
	1,200	22×50	2.69	EKMR161VSN122MP50S
	1,200	25.4×35	2.45	EKMR161VSN122MQ35S
	1,500	25.4×40	2.82	EKMR161VSN152MQ40S
	1,500	25.4×45	2.88	EKMR161VSN152MQ45S
	1,500	30×30	2.39	EKMR161VSN152MR30S
	1,500	35×25	2.17	EKMR161VSN152MA25S
	1,800	25.4×50	3.22	EKMR161VSN182MQ50S
	1,800	30×35	2.73	EKMR161VSN182MR35S
	1,800	30×40	2.82	EKMR161VSN182MR40S
	1,800	35×30	2.47	EKMR161VSN182MA30S
	2,200	30×45	3.23	EKMR161VSN222MR45S
	2,200	35×35	2.79	EKMR161VSN222MA35S
	2,700	30×50	3.66	EKMR161VSN272MR50S
	2,700	35×40	3.23	EKMR161VSN272MA40S
	3,300	35×45	3.68	EKMR161VSN332MA45S
	3,900	35×50	4.12	EKMR161VSN392MA50S
180	470	22×25	1.45	EKMR181VSN471MP25S
	560	22×30	1.66	EKMR181VSN561MP30S
	680	22×35	1.87	EKMR181VSN681MP35S
	680	25.4×25	1.72	EKMR181VSN681MQ25S
	820	22×40	2.11	EKMR181VSN821MP40S
	820	25.4×30	1.94	EKMR181VSN821MQ30S
	1,000	22×45	2.38	EKMR181VSN102MP45S
	1,000	25.4×35	2.24	EKMR181VSN102MQ35S
	1,000	30×25	1.90	EKMR181VSN102MR25S
	1,200	22×50	2.69	EKMR181VSN122MP50S
	1,200	25.4×40	2.52	EKMR181VSN122MQ40S
	1,200	30×30	2.14	EKMR181VSN122MR30S
	1,200	35×25	1.94	EKMR181VSN122MA25S
	1,500	25.4×45	2.88	EKMR181VSN152MQ45S
	1,500	25.4×50	2.94	EKMR181VSN152MQ50S
	1,500	30×35	2.49	EKMR181VSN152MR35S
	1,800	30×40	2.82	EKMR181VSN182MR40S
	1,800	35×30	2.47	EKMR181VSN182MA30S
	2,200	30×45	3.23	EKMR181VSN222MR45S
	2,200	30×50	3.31	EKMR181VSN222MR50S
	2,200	35×35	2.79	EKMR181VSN222MA35S
	2,200	35×40	2.92	EKMR181VSN222MA40S
	2,700	35×45	3.33	EKMR181VSN272MA45S
	3,300	35×50	3.79	EKMR181VSN332MA50S
200	560	22×30	1.66	EKMR201VSN561MP30S
	560	25.4×25	1.56	EKMR201VSN561MQ25S
	680	22×35	1.87	EKMR201VSN681MP35S
	680	25.4×30	1.77	EKMR201VSN681MQ30S
	820	22×40	2.11	EKMR201VSN821MP40S
	820	25.4×35	2.03	EKMR201VSN821MQ35S
	820	30×25	1.72	EKMR201VSN821MR25S
	1,000	22×50	2.45	EKMR201VSN102MP50S
	1,000	25.4×40	2.30	EKMR201VSN102MQ40S
	1,000	30×30	1.95	EKMR201VSN102MR30S
	1,200	25.4×45	2.58	EKMR201VSN122MQ45S
	1,200	30×35	2.23	EKMR201VSN122MR35S
	1,200	35×25	1.94	EKMR201VSN122MA25S
	1,500	25.4×50	2.94	EKMR201VSN152MQ50S
	1,500	30×40	2.58	EKMR201VSN152MR40S
	1,500	35×30	2.25	EKMR201VSN152MA30S
	1,800	30×45	2.92	EKMR201VSN182MR45S
	1,800	35×35	2.53	EKMR201VSN182MA35S
	2,200	30×50	3.31	EKMR201VSN222MR50S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Rated ripple current (Arms/105℃,120Hz)	Part No.
200	2,200	35×40	2.92	EKMR201VSN222MA40S
	2,700	35×45	3.33	EKMR201VSN272MA45S
	2,700	35×50	3.43	EKMR201VSN272MA50S
250	330	22×25	1.21	EKMR251VSN331MP25S
	390	22×30	1.38	EKMR251VSN391MP30S
	470	22×35	1.56	EKMR251VSN471MP35S
	560	22×40	1.74	EKMR251VSN561MP40S
	560	25.4×30	1.61	EKMR251VSN561MQ30S
	560	30×25	1.42	EKMR251VSN561MR25S
	680	22×45	1.97	EKMR251VSN681MP45S
	680	25.4×35	1.85	EKMR251VSN681MQ35S
	820	25.4×40	2.08	EKMR251VSN821MQ40S
	820	25.4×45	2.13	EKMR251VSN821MQ45S
	820	30×30	1.77	EKMR251VSN821MR30S
	820	35×25	1.60	EKMR251VSN821MA25S
	1,000	25.4×50	2.40	EKMR251VSN102MQ50S
	1,000	30×35	2.03	EKMR251VSN102MR35S
	1,200	30×40	2.31	EKMR251VSN122MR40S
	1,200	30×45	2.38	EKMR251VSN122MR45S
	1,200	35×35	2.06	EKMR251VSN122MA35S
	1,500	30×50	2.73	EKMR251VSN152MR50S
	1,500	35×40	2.41	EKMR251VSN152MA40S
	1,800	35×45	2.72	EKMR251VSN182MA45S
	2,200	35×50	3.10	EKMR251VSN222MA50S
315	180	22×25	0.91	EKMR3B1VSN181MP25S
	220	22×30	1.06	EKMR3B1VSN221MP30S
	270	22×35	1.20	EKMR3B1VSN271MP35S
	270	25.4×25	1.15	EKMR3B1VSN271MQ25S
	330	22×40	1.37	EKMR3B1VSN331MP40S
	330	25.4×30	1.30	EKMR3B1VSN331MQ30S
	390	22×45	1.52	EKMR3B1VSN391MP45S
	390	25.4×35	1.48	EKMR3B1VSN391MQ35S
	390	30×25	1.39	EKMR3B1VSN391MR25S
	470	22×50	1.72	EKMR3B1VSN471MP50S
	470	25.4×40	1.67	EKMR3B1VSN471MQ40S
	470	30×30	1.57	EKMR3B1VSN471MR30S
	470	35×25	1.52	EKMR3B1VSN471MA25S
	560	25.4×45	1.86	EKMR3B1VSN561MQ45S
	560	30×35	1.78	EKMR3B1VSN561MR35S
	680	25.4×50	2.10	EKMR3B1VSN681MQ50S
	680	30×40	2.03	EKMR3B1VSN681MR40S
	680	35×30	1.90	EKMR3B1VSN681MA30S
	820	30×45	2.31	EKMR3B1VSN821MR45S
	820	35×35	2.13	EKMR3B1VSN821MA35S
	1,000	30×50	2.61	EKMR3B1VSN102MR50S
	1,000	35×40	2.46	EKMR3B1VSN102MA40S
	1,200	35×45	2.78	EKMR3B1VSN122MA45S
	1,200	35×50	2.86	EKMR3B1VSN122MA50S
350	150	22×25	0.84	EKMR351VSN151MP25S
	220	22×30	1.06	EKMR351VSN221MP30S
	220	25.4×25	1.04	EKMR351VSN221MQ25S
	270	22×35	1.20	EKMR351VSN271MP35S
	270	25.4×30	1.18	EKMR351VSN271MQ30S
	330	22×40	1.37	EKMR351VSN331MP40S
	330	22×45	1.40	EKMR351VSN331MP45S
	330	25.4×35	1.36	EKMR351VSN331MQ35S
	330	30×25	1.28	EKMR351VSN331MR25S
	390	22×50	1.56	EKMR351VSN391MP50S
	390	25.4×40	1.52	EKMR351VSN391MQ40S
	390	30×30	1.43	EKMR351VSN391MR30S
	390	35×25	1.38	EKMR351VSN391MA25S
	470	25.4×45	1.71	EKMR351VSN471MQ45S
	560	25.4×50	1.90	EKMR351VSN561MQ50S
	560	30×35	1.78	EKMR351VSN561MR35S
	560	30×40	1.84	EKMR351VSN561MR40S
	560	35×30	1.72	EKMR351VSN561MA30S
	680	30×45	2.10	EKMR351VSN681MR45S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMR Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Rated ripple current (Arms/105℃,120Hz)	Part No.
350	680	35×35	1.94	EKMR351VSN681MA35S
	820	30×50	2.36	EKMR351VSN821MR50S
	820	35×40	2.23	EKMR351VSN821MA40S
	1,000	35×45	2.54	EKMR351VSN102MA45S
	1,200	35×50	2.86	EKMR351VSN122MA50S
400	120	22×25	0.75	EKMR401VSN121MP25S
	180	22×30	0.96	EKMR401VSN181MP30S
	180	25.4×25	0.94	EKMR401VSN181MQ25S
	220	22×35	1.09	EKMR401VSN221MP35S
	220	25.4×30	1.07	EKMR401VSN221MQ30S
	270	22×40	1.24	EKMR401VSN271MP40S
	270	22×45	1.26	EKMR401VSN271MP45S
	270	25.4×35	1.23	EKMR401VSN271MQ35S
	270	30×25	1.16	EKMR401VSN271MR25S
	330	22×50	1.44	EKMR401VSN331MP50S
	330	25.4×40	1.40	EKMR401VSN331MQ40S
	330	30×30	1.31	EKMR401VSN331MR30S
	330	35×25	1.27	EKMR401VSN331MA25S
	390	25.4×45	1.55	EKMR401VSN391MQ45S
	390	30×35	1.49	EKMR401VSN391MR35S
	470	25.4×50	1.74	EKMR401VSN471MQ50S
	470	30×40	1.69	EKMR401VSN471MR40S
	470	35×30	1.58	EKMR401VSN471MA30S
	560	30×45	1.91	EKMR401VSN561MR45S
	560	35×35	1.76	EKMR401VSN561MA35S
	680	30×50	2.15	EKMR401VSN681MR50S
	680	35×40	2.03	EKMR401VSN681MA40S
	820	35×45	2.30	EKMR401VSN821MA45S
	820	35×50	2.37	EKMR401VSN821MA50S
420	120	22×25	0.78	EKMR421VSN121MP25S
	150	22×30	0.91	EKMR421VSN151MP30S
	150	25.4×25	0.89	EKMR421VSN151MQ25S
	180	22×35	1.03	EKMR421VSN181MP35S
	180	25.4×30	1.00	EKMR421VSN181MQ30S
	220	22×40	1.16	EKMR421VSN221MP40S
	220	22×45	1.19	EKMR421VSN221MP45S
	220	25.4×35	1.16	EKMR421VSN221MQ35S
	220	30×25	1.11	EKMR421VSN221MR25S
	270	22×50	1.36	EKMR421VSN271MP50S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	Rated ripple current (Arms/105℃,120Hz)	Part No.
420	270	25.4×40	1.32	EKMR421VSN271MQ40S
	270	30×30	1.26	EKMR421VSN271MR30S
	270	35×25	1.26	EKMR421VSN271MA25S
	330	25.4×45	1.49	EKMR421VSN331MQ45S
	330	30×35	1.45	EKMR421VSN331MR35S
	390	25.4×50	1.66	EKMR421VSN391MQ50S
	390	30×40	1.63	EKMR421VSN391MR40S
	390	35×30	1.58	EKMR421VSN391MA30S
	470	30×45	1.85	EKMR421VSN471MR45S
	470	35×35	1.77	EKMR421VSN471MA35S
	560	30×50	2.07	EKMR421VSN561MR50S
	560	35×40	2.02	EKMR421VSN561MA40S
	680	35×45	2.29	EKMR421VSN681MA45S
	820	35×50	2.59	EKMR421VSN821MA50S
450	100	22×25	0.71	EKMR451VSN101MP25S
	120	22×30	0.82	EKMR451VSN121MP30S
	150	22×35	0.94	EKMR451VSN151MP35S
	150	25.4×25	0.89	EKMR451VSN151MQ25S
	180	22×40	1.05	EKMR451VSN181MP40S
	180	25.4×30	1.00	EKMR451VSN181MQ30S
	220	22×45	1.19	EKMR451VSN221MP45S
	220	25.4×35	1.16	EKMR451VSN221MQ35S
	220	30×25	1.11	EKMR451VSN221MR25S
	270	22×50	1.36	EKMR451VSN271MP50S
	270	25.4×40	1.32	EKMR451VSN271MQ40S
	270	25.4×45	1.35	EKMR451VSN271MQ45S
	270	30×30	1.26	EKMR451VSN271MR30S
	270	35×25	1.26	EKMR451VSN271MA25S
	330	25.4×50	1.52	EKMR451VSN331MQ50S
	330	30×35	1.45	EKMR451VSN331MR35S
	330	35×30	1.45	EKMR451VSN331MA30S
	390	30×40	1.63	EKMR451VSN391MR40S
	470	30×45	1.85	EKMR451VSN471MR45S
	470	30×50	1.90	EKMR451VSN471MR50S
	470	35×35	1.77	EKMR451VSN471MA35S
	560	35×40	2.02	EKMR451VSN561MA40S
	560	35×45	2.08	EKMR451VSN561MA45S
	680	35×50	2.36	EKMR451VSN681MA50S

◆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
315 to 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

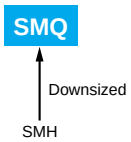
NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 85℃

SMQ Series

- Downsized from current downsized snap-ins SMH series
- Endurance with ripple current : 2,000 hours at 85℃
- Non solvent resistant type
- **RoHS Compliant**

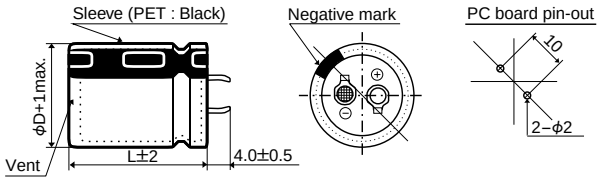


◆SPECIFICATIONS

Items	Characteristics				
Category Temperature Range	−25 to +85℃				
Rated Voltage Range	160 to 450Vdc				
Capacitance Tolerance	±20% (M)				(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)				(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 250V	315 to 400V	420 & 450V	
	tanδ (Max.)	0.15	0.15	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 250V	315 to 400V	420 & 450V	
	Z(−25℃)/Z(+20℃)	4	8	8	(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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.				
	Capacitance change	≦±15% of the initial value			
	D.F. (tanδ)	≦150% of the initial specified value			
	Leakage current	≦The initial specified value			

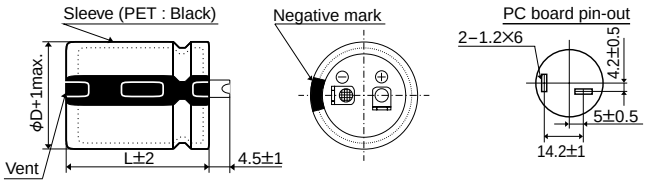
◆DIMENSIONS [mm]

●Terminal Code : VS (φ22 to φ35) : Standard

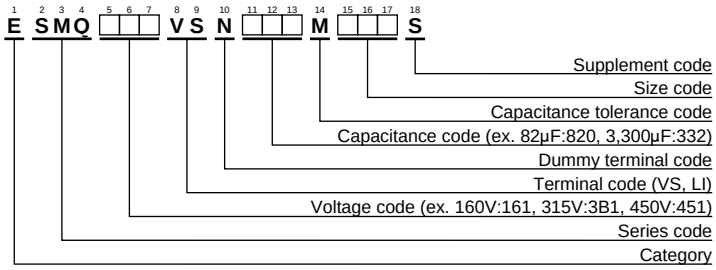


The standard design has no plastic disc.

●Terminal Code : LI (φ35)



◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 85℃

SMQ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
160	560	22×25	0.15	2.25	ESMQ161VSN561MP25S
	680	22×30	0.15	2.50	ESMQ161VSN681MP30S
	820	22×35	0.15	2.75	ESMQ161VSN821MP35S
	1,000	22×40	0.15	3.00	ESMQ161VSN102MP40S
	1,000	25.4×30	0.15	3.00	ESMQ161VSN102MQ30S
	1,200	22×45	0.15	3.25	ESMQ161VSN122MP45S
	1,200	25.4×35	0.15	3.25	ESMQ161VSN122MQ35S
	1,200	30×25	0.15	3.25	ESMQ161VSN122MR25S
	1,500	22×50	0.15	3.73	ESMQ161VSN152MP50S
	1,500	25.4×40	0.15	3.73	ESMQ161VSN152MQ40S
	1,500	30×30	0.15	3.73	ESMQ161VSN152MR30S
	1,500	35×25	0.15	3.73	ESMQ161VSN152MA25S
	1,800	25.4×45	0.15	4.20	ESMQ161VSN182MQ45S
	1,800	30×35	0.15	4.20	ESMQ161VSN182MR35S
	1,800	35×30	0.15	4.20	ESMQ161VSN182MA30S
	2,200	30×40	0.15	4.78	ESMQ161VSN222MR40S
	2,200	35×35	0.15	4.78	ESMQ161VSN222MA35S
	2,700	35×40	0.15	5.45	ESMQ161VSN272MA40S
	3,300	35×45	0.15	5.75	ESMQ161VSN332MA45S
	3,900	35×50	0.15	6.00	ESMQ161VSN392MA50S
180	470	22×25	0.15	2.08	ESMQ181VSN471MP25S
	560	22×30	0.15	2.25	ESMQ181VSN561MP30S
	680	22×30	0.15	2.50	ESMQ181VSN681MP30S
	680	25.4×25	0.15	2.50	ESMQ181VSN681MQ25S
	820	22×35	0.15	2.75	ESMQ181VSN821MP35S
	820	25.4×30	0.15	2.75	ESMQ181VSN821MQ30S
	1,000	22×45	0.15	3.00	ESMQ181VSN102MP45S
	1,000	25.4×35	0.15	3.00	ESMQ181VSN102MQ35S
	1,000	30×25	0.15	3.00	ESMQ181VSN102MR25S
	1,200	22×50	0.15	3.31	ESMQ181VSN122MP50S
	1,200	25.4×40	0.15	3.31	ESMQ181VSN122MQ40S
	1,200	30×30	0.15	3.31	ESMQ181VSN122MR30S
	1,200	35×25	0.15	3.31	ESMQ181VSN122MA25S
	1,500	25.4×45	0.15	3.83	ESMQ181VSN152MQ45S
	1,500	30×35	0.15	3.83	ESMQ181VSN152MR35S
	1,500	35×30	0.15	3.83	ESMQ181VSN152MA30S
	1,800	25.4×50	0.15	4.32	ESMQ181VSN182MQ50S
	1,800	30×40	0.15	4.32	ESMQ181VSN182MR40S
	1,800	35×30	0.15	4.32	ESMQ181VSN182MA30S
	2,200	30×45	0.15	4.92	ESMQ181VSN222MR45S
	2,200	35×40	0.15	4.92	ESMQ181VSN222MA40S
	2,700	35×45	0.15	5.52	ESMQ181VSN272MA45S
	3,300	35×50	0.15	5.75	ESMQ181VSN332MA50S
200	390	22×25	0.15	1.68	ESMQ201VSN391MP25S
	470	22×30	0.15	1.85	ESMQ201VSN471MP30S
	560	22×30	0.15	2.43	ESMQ201VSN561MP30S
	560	25.4×25	0.15	2.43	ESMQ201VSN561MQ25S
	680	22×35	0.15	2.68	ESMQ201VSN681MP35S
	680	25.4×30	0.15	2.68	ESMQ201VSN681MQ30S
	820	22×40	0.15	2.93	ESMQ201VSN821MP40S
	820	25.4×30	0.15	2.93	ESMQ201VSN821MQ30S
	820	30×25	0.15	2.93	ESMQ201VSN821MR25S
	1,000	22×45	0.15	3.25	ESMQ201VSN102MP45S
	1,000	25.4×35	0.15	3.25	ESMQ201VSN102MQ35S
	1,000	30×30	0.15	3.25	ESMQ201VSN102MR30S
	1,000	35×25	0.15	3.25	ESMQ201VSN102MA25S
	1,200	25.4×40	0.15	3.50	ESMQ201VSN122MQ40S
	1,200	30×30	0.15	3.50	ESMQ201VSN122MR30S
	1,200	35×30	0.15	3.50	ESMQ201VSN122MA30S
	1,500	25.4×50	0.15	3.87	ESMQ201VSN152MQ50S
	1,500	30×35	0.15	3.87	ESMQ201VSN152MR35S
	1,500	35×30	0.15	3.87	ESMQ201VSN152MA30S
	1,800	30×45	0.15	4.32	ESMQ201VSN182MR45S
	1,800	35×35	0.15	4.32	ESMQ201VSN182MA35S
	2,200	30×50	0.15	4.92	ESMQ201VSN222MR50S
	2,200	35×40	0.15	4.92	ESMQ201VSN222MA40S
	2,700	35×50	0.15	5.45	ESMQ201VSN272MA50S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
250	270	22×25	0.15	1.31	ESMQ251VSN271MP25S
	330	22×30	0.15	1.75	ESMQ251VSN331MP30S
	390	22×30	0.15	1.91	ESMQ251VSN391MP30S
	390	25.4×25	0.15	1.91	ESMQ251VSN391MQ25S
	470	22×35	0.15	2.11	ESMQ251VSN471MP35S
	470	25.4×30	0.15	2.11	ESMQ251VSN471MQ30S
	560	22×40	0.15	2.25	ESMQ251VSN561MP40S
	560	25.4×30	0.15	2.25	ESMQ251VSN561MQ30S
	560	30×25	0.15	2.25	ESMQ251VSN561MR25S
	680	22×45	0.15	2.50	ESMQ251VSN681MP45S
	680	25.4×35	0.15	2.50	ESMQ251VSN681MQ35S
	680	30×30	0.15	2.50	ESMQ251VSN681MR30S
	820	22×50	0.15	2.77	ESMQ251VSN821MP50S
	820	25.4×40	0.15	2.77	ESMQ251VSN821MQ40S
	820	30×30	0.15	2.77	ESMQ251VSN821MR30S
	820	35×25	0.15	2.77	ESMQ251VSN821MA25S
	1,000	25.4×45	0.15	3.32	ESMQ251VSN102MQ45S
	1,000	30×35	0.15	3.32	ESMQ251VSN102MR35S
	1,000	35×30	0.15	3.32	ESMQ251VSN102MA30S
	1,200	30×40	0.15	3.53	ESMQ251VSN122MR40S
	1,200	35×35	0.15	3.53	ESMQ251VSN122MA35S
	1,500	30×50	0.15	4.04	ESMQ251VSN152MR50S
	1,500	35×40	0.15	4.04	ESMQ251VSN152MA40S
	1,800	35×45	0.15	4.55	ESMQ251VSN182MA45S
315	180	22×25	0.15	1.21	ESMQ3B1VSN181MP25S
	220	22×30	0.15	1.41	ESMQ3B1VSN221MP30S
	270	22×30	0.15	1.60	ESMQ3B1VSN271MP30S
	330	22×40	0.15	1.82	ESMQ3B1VSN331MP40S
	330	25.4×30	0.15	1.82	ESMQ3B1VSN331MQ30S
	330	30×25	0.15	1.82	ESMQ3B1VSN331MR25S
	390	22×45	0.15	2.01	ESMQ3B1VSN391MP45S
	390	25.4×35	0.15	2.01	ESMQ3B1VSN391MQ35S
	390	30×30	0.15	2.01	ESMQ3B1VSN391MR30S
	470	22×50	0.15	2.27	ESMQ3B1VSN471MP50S
	470	25.4×40	0.15	2.27	ESMQ3B1VSN471MQ40S
	470	30×30	0.15	2.27	ESMQ3B1VSN471MR30S
	470	35×25	0.15	2.27	ESMQ3B1VSN471MA25S
	560	25.4×45	0.15	2.56	ESMQ3B1VSN561MQ45S
	560	30×35	0.15	2.56	ESMQ3B1VSN561MR35S
	560	35×30	0.15	2.56	ESMQ3B1VSN561MA30S
	680	30×40	0.15	2.87	ESMQ3B1VSN681MR40S
	680	35×35	0.15	2.87	ESMQ3B1VSN681MA35S
	820	30×45	0.15	3.25	ESMQ3B1VSN821MR45S
	820	35×40	0.15	3.25	ESMQ3B1VSN821MA40S
	1,000	30×50	0.15	3.63	ESMQ3B1VSN102MR50S
	1,000	35×45	0.15	3.63	ESMQ3B1VSN102MA45S
350	150	22×25	0.15	1.12	ESMQ351VSN151MP25S
	180	22×30	0.15	1.22	ESMQ351VSN181MP30S
	220	22×35	0.15	1.44	ESMQ351VSN221MP35S
	270	22×40	0.15	1.66	ESMQ351VSN271MP40S
	270	25.4×30	0.15	1.66	ESMQ351VSN271MQ30S
	330	22×45	0.15	1.88	ESMQ351VSN331MP45S
	330	25.4×35	0.15	1.88	ESMQ351VSN331MQ35S
	390	22×50	0.15	2.06	ESMQ351VSN391MP50S
	390	25.4×40	0.15	2.06	ESMQ351VSN391MQ40S
	390	30×30	0.15	2.06	ESMQ351VSN391MR30S
	390	35×25	0.15	2.06	ESMQ351VSN391MA25S
	470	25.4×45	0.15	2.40	ESMQ351VSN471MQ45S
	470	30×35	0.15	2.40	ESMQ351VSN471MR35S
	470	35×30	0.15	2.40	ESMQ351VSN471MA30S
	560	25.4×50	0.15	2.60	ESMQ351VSN561MQ50S
	560	30×40	0.15	2.60	ESMQ351VSN561MR40S
	560	35×30	0.15	2.60	ESMQ351VSN561MA30S
	680	30×45	0.15	2.96	ESMQ351VSN681MR45S
	680	35×35	0.15	2.96	ESMQ351VSN681MA35S
	820	30×50	0.15	3.25	ESMQ351VSN821MR50S
	820	35×45	0.15	3.25	ESMQ351VSN821MA45S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 85℃

SMQ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
350	1,000	35×50	0.15	3.54	ESMQ351VSN102MA50S
400	120	22×25	0.15	1.02	ESMQ401VSN121MP25S
	150	22×30	0.15	1.16	ESMQ401VSN151MP30S
	180	22×35	0.15	1.44	ESMQ401VSN181MP35S
	220	22×40	0.15	1.49	ESMQ401VSN221MP40S
	220	25.4×30	0.15	1.49	ESMQ401VSN221MQ30S
	270	22×45	0.15	1.67	ESMQ401VSN271MP45S
	270	25.4×35	0.15	1.67	ESMQ401VSN271MQ35S
	270	30×25	0.15	1.67	ESMQ401VSN271MR25S
	330	22×50	0.15	1.90	ESMQ401VSN331MP50S
	330	25.4×40	0.15	1.90	ESMQ401VSN331MQ40S
	330	30×30	0.15	1.90	ESMQ401VSN331MR30S
	330	35×25	0.15	1.90	ESMQ401VSN331MA25S
	390	25.4×45	0.15	2.13	ESMQ401VSN391MQ45S
	390	30×35	0.15	2.13	ESMQ401VSN391MR35S
	390	35×30	0.15	2.13	ESMQ401VSN391MA30S
	470	25.4×50	0.15	2.39	ESMQ401VSN471MQ50S
	470	30×40	0.15	2.39	ESMQ401VSN471MR40S
	470	35×30	0.15	2.39	ESMQ401VSN471MA30S
	560	30×45	0.15	2.69	ESMQ401VSN561MR45S
	560	35×35	0.15	2.69	ESMQ401VSN561MA35S
	680	30×50	0.15	2.96	ESMQ401VSN681MR50S
	680	35×40	0.15	2.96	ESMQ401VSN681MA40S
	820	35×45	0.15	3.25	ESMQ401VSN821MA45S
420	100	22×25	0.20	0.97	ESMQ421VSN101MP25S
	120	22×25	0.20	1.08	ESMQ421VSN121MP25S
	150	22×30	0.20	1.30	ESMQ421VSN151MP30S
	150	25.4×25	0.20	1.30	ESMQ421VSN151MQ25S
	180	22×35	0.20	1.48	ESMQ421VSN181MP35S
	180	25.4×30	0.20	1.48	ESMQ421VSN181MQ30S
	220	22×40	0.20	1.65	ESMQ421VSN221MP40S
	220	25.4×35	0.20	1.65	ESMQ421VSN221MQ35S
	220	30×25	0.20	1.65	ESMQ421VSN221MR25S
	270	22×50	0.20	1.94	ESMQ421VSN271MP50S
	270	25.4×35	0.20	1.94	ESMQ421VSN271MQ35S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
420	270	30×30	0.20	1.94	ESMQ421VSN271MR30S
	330	25.4×45	0.20	2.17	ESMQ421VSN331MQ45S
	330	30×35	0.20	2.17	ESMQ421VSN331MR35S
	330	35×30	0.20	2.17	ESMQ421VSN331MA30S
	390	25.4×50	0.20	2.27	ESMQ421VSN391MQ50S
	390	30×35	0.20	2.27	ESMQ421VSN391MR35S
	390	35×30	0.20	2.27	ESMQ421VSN391MA30S
	470	30×40	0.20	2.61	ESMQ421VSN471MR40S
	470	35×35	0.20	2.61	ESMQ421VSN471MA35S
	560	30×50	0.20	2.82	ESMQ421VSN561MR50S
	560	35×40	0.20	2.82	ESMQ421VSN561MA40S
	680	35×45	0.20	3.11	ESMQ421VSN681MA45S
450	82	22×25	0.20	0.83	ESMQ451VSN820MP25S
	100	22×25	0.20	0.93	ESMQ451VSN101MP25S
	120	22×30	0.20	1.04	ESMQ451VSN121MP30S
	150	22×35	0.20	1.19	ESMQ451VSN151MP35S
	150	25.4×25	0.20	1.19	ESMQ451VSN151MQ25S
	180	22×40	0.20	1.35	ESMQ451VSN181MP40S
	180	25.4×30	0.20	1.35	ESMQ451VSN181MQ30S
	220	22×45	0.20	1.55	ESMQ451VSN221MP45S
	220	25.4×40	0.20	1.55	ESMQ451VSN221MQ40S
	220	30×30	0.20	1.55	ESMQ451VSN221MR30S
	220	35×25	0.20	1.55	ESMQ451VSN221MA25S
	270	22×50	0.20	1.78	ESMQ451VSN271MP50S
	270	25.4×40	0.20	1.78	ESMQ451VSN271MQ40S
	270	30×30	0.20	1.78	ESMQ451VSN271MR30S
	330	25.4×50	0.20	2.01	ESMQ451VSN331MQ50S
	330	30×40	0.20	2.01	ESMQ451VSN331MR40S
	330	35×30	0.20	2.01	ESMQ451VSN331MA30S
	390	30×40	0.20	2.24	ESMQ451VSN391MR40S
	390	35×35	0.20	2.24	ESMQ451VSN391MA35S
	470	30×45	0.20	2.53	ESMQ451VSN471MR45S
	470	35×40	0.20	2.53	ESMQ451VSN471MA40S
	560	30×50	0.20	2.82	ESMQ451VSN561MR50S
	560	35×45	0.20	2.82	ESMQ451VSN561MA45S

◆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
315 to 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

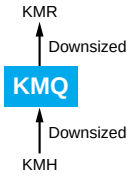
NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMQ Series

- Downsized from current downsized snap-ins KMH series
- Endurance with ripple current : 2,000 hours at 105℃
- Non solvent resistant type
- **RoHS Compliant**

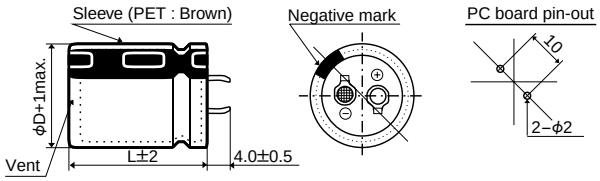


◆SPECIFICATIONS

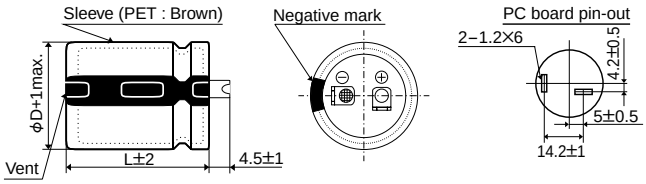
Items	Characteristics								
Category Temperature Range	−40 to +105℃ (35&50Vdc), −25 to +105℃ (160 to 450Vdc)								
Rated Voltage Range	35&50Vdc, 160 to 450Vdc								
Capacitance Tolerance	±20% (M)								(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)								(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	35V		50V		160 to 250V	315 to 400V	420 & 450V	
	Nominal capacitance (μF)	10,000>C	C≧10,000	10,000>C	C≧10,000	–	–	–	
	tanδ (Max.)	0.30	0.35	0.25	0.30	0.15	0.15	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	35&50V	160 to 250V	315 to 450V					
	Z(−40℃)/Z(+20℃)	4	–	–					
	Z(−25℃)/Z(+20℃)	10	4	8					(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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.								
	Capacitance change	≦±15% of the initial value							
	D.F. (tanδ)	≦150% of the initial specified value							
	Leakage current	≦The initial specified value							

◆DIMENSIONS [mm]

●Terminal Code : VS (φ22 to φ35) : Standard

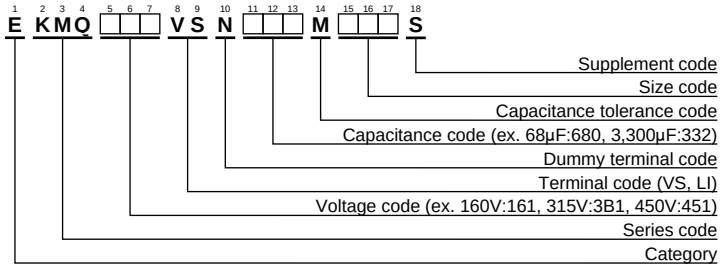


●Terminal Code : LI (φ35)



The standard design has no plastic disc.

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMQ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
35	4,700	22×25	0.30	1.87	EKMQ350VSN472MP25S
	5,600	22×25	0.30	2.04	EKMQ350VSN562MP25S
	5,600	25.4×25	0.30	2.00	EKMQ350VSN562MQ25S
	6,800	22×30	0.30	2.36	EKMQ350VSN682MP30S
	6,800	25.4×25	0.30	2.21	EKMQ350VSN682MQ25S
	8,200	22×35	0.30	2.65	EKMQ350VSN822MP35S
	8,200	25.4×30	0.30	2.49	EKMQ350VSN822MQ30S
	8,200	30×25	0.30	2.62	EKMQ350VSN822MR25S
	10,000	22×40	0.35	3.00	EKMQ350VSN103MP40S
	10,000	25.4×35	0.35	2.88	EKMQ350VSN103MQ35S
	10,000	30×25	0.35	2.90	EKMQ350VSN103MR25S
	12,000	22×50	0.35	3.47	EKMQ350VSN123MP50S
	12,000	25.4×35	0.35	3.15	EKMQ350VSN123MQ35S
	12,000	30×30	0.35	3.25	EKMQ350VSN123MR30S
	12,000	35×25	0.35	3.20	EKMQ350VSN123MA25S
	15,000	25.4×40	0.35	3.61	EKMQ350VSN153MQ40S
	15,000	30×35	0.35	3.78	EKMQ350VSN153MR35S
	15,000	35×25	0.35	3.60	EKMQ350VSN153MA25S
	18,000	25.4×50	0.35	4.14	EKMQ350VSN183MQ50S
	18,000	30×40	0.35	4.30	EKMQ350VSN183MR40S
	18,000	35×30	0.35	4.10	EKMQ350VSN183MA30S
	22,000	30×50	0.35	5.00	EKMQ350VSN223MR50S
	22,000	35×35	0.35	4.64	EKMQ350VSN223MA35S
	27,000	35×40	0.35	5.37	EKMQ350VSN273MA40S
	33,000	35×50	0.35	6.00	EKMQ350VSN333MA50S
50	2,700	22×25	0.25	1.65	EKMQ500VSN272MP25S
	3,300	22×30	0.25	1.92	EKMQ500VSN332MP30S
	3,300	25.4×25	0.25	1.76	EKMQ500VSN332MQ25S
	3,900	22×30	0.25	2.08	EKMQ500VSN392MP30S
	3,900	25.4×25	0.25	2.04	EKMQ500VSN392MQ25S
	4,700	22×35	0.25	2.43	EKMQ500VSN472MP35S
	4,700	25.4×30	0.25	2.50	EKMQ500VSN472MQ30S
	4,700	30×25	0.25	2.29	EKMQ500VSN472MR25S
	5,600	22×40	0.25	2.63	EKMQ500VSN562MP40S
	5,600	25.4×35	0.25	2.61	EKMQ500VSN562MQ35S
	5,600	30×25	0.25	2.80	EKMQ500VSN562MR25S
	6,800	22×50	0.25	3.05	EKMQ500VSN682MP50S
	6,800	25.4×40	0.25	2.94	EKMQ500VSN682MQ40S
	6,800	30×30	0.25	3.30	EKMQ500VSN682MR30S
	6,800	35×25	0.25	2.77	EKMQ500VSN682MA25S
	8,200	25.4×45	0.25	3.60	EKMQ500VSN822MQ45S
	8,200	30×35	0.25	3.60	EKMQ500VSN822MR35S
	8,200	35×30	0.25	3.60	EKMQ500VSN822MA30S
	10,000	25.4×50	0.30	4.00	EKMQ500VSN103MQ50S
	10,000	30×40	0.30	4.00	EKMQ500VSN103MR40S
	10,000	35×30	0.30	4.00	EKMQ500VSN103MA30S
	12,000	30×50	0.30	4.29	EKMQ500VSN123MR50S
	12,000	35×35	0.30	4.37	EKMQ500VSN123MA35S
	15,000	35×40	0.30	4.50	EKMQ500VSN153MA40S
	18,000	35×50	0.30	5.30	EKMQ500VSN183MA50S
160	470	22×25	0.15	1.40	EKMQ161VSN471MP25S
	560	22×30	0.15	1.50	EKMQ161VSN561MP30S
	680	22×30	0.15	1.70	EKMQ161VSN681MP30S
	680	25.4×25	0.15	1.70	EKMQ161VSN681MQ25S
	820	22×35	0.15	2.00	EKMQ161VSN821MP35S
	820	25.4×30	0.15	2.00	EKMQ161VSN821MQ30S
	820	30×25	0.15	2.00	EKMQ161VSN821MR25S
	1,000	22×40	0.15	2.20	EKMQ161VSN102MP40S
	1,000	25.4×35	0.15	2.20	EKMQ161VSN102MQ35S
	1,000	30×25	0.15	2.20	EKMQ161VSN102MR25S
	1,200	25.4×40	0.15	2.30	EKMQ161VSN122MQ40S
	1,200	30×30	0.15	2.30	EKMQ161VSN122MR30S
	1,200	35×25	0.15	2.30	EKMQ161VSN122MA25S
	1,500	25.4×45	0.15	2.50	EKMQ161VSN152MQ45S
	1,500	30×35	0.15	2.50	EKMQ161VSN152MR35S
	1,500	35×30	0.15	2.50	EKMQ161VSN152MA30S
	1,800	25.4×50	0.15	2.70	EKMQ161VSN182MQ50S
160	1,800	30×40	0.15	2.70	EKMQ161VSN182MR40S
	1,800	35×30	0.15	2.70	EKMQ161VSN182MA30S
	2,200	30×45	0.15	2.90	EKMQ161VSN222MR45S
	2,200	35×35	0.15	2.90	EKMQ161VSN222MA35S
	2,700	30×50	0.15	3.10	EKMQ161VSN272MR50S
	2,700	35×40	0.15	3.10	EKMQ161VSN272MA40S
	3,300	35×50	0.15	3.30	EKMQ161VSN332MA50S
180	390	22×25	0.15	1.30	EKMQ181VSN391MP25S
	470	22×30	0.15	1.40	EKMQ181VSN471MP30S
	560	22×30	0.15	1.50	EKMQ181VSN561MP30S
	560	25.4×25	0.15	1.50	EKMQ181VSN561MQ25S
	680	22×35	0.15	1.70	EKMQ181VSN681MP35S
	680	25.4×30	0.15	1.70	EKMQ181VSN681MQ30S
	820	22×40	0.15	2.00	EKMQ181VSN821MP40S
	820	25.4×30	0.15	2.00	EKMQ181VSN821MQ30S
	820	30×25	0.15	2.00	EKMQ181VSN821MR25S
	1,000	22×45	0.15	2.20	EKMQ181VSN102MP45S
	1,000	25.4×40	0.15	2.20	EKMQ181VSN102MQ40S
	1,000	30×30	0.15	2.20	EKMQ181VSN102MR30S
	1,000	35×25	0.15	2.20	EKMQ181VSN102MA25S
	1,200	25.4×45	0.15	2.30	EKMQ181VSN122MQ45S
	1,200	30×35	0.15	2.30	EKMQ181VSN122MR35S
	1,200	35×30	0.15	2.30	EKMQ181VSN122MA30S
	1,500	25.4×50	0.15	2.50	EKMQ181VSN152MQ50S
	1,500	30×40	0.15	2.50	EKMQ181VSN152MR40S
	1,500	35×30	0.15	2.50	EKMQ181VSN152MA30S
	1,800	30×45	0.15	2.70	EKMQ181VSN182MR45S
	1,800	35×35	0.15	2.70	EKMQ181VSN182MA35S
	2,200	30×50	0.15	2.90	EKMQ181VSN222MR50S
	2,200	35×40	0.15	2.90	EKMQ181VSN222MA40S
	2,700	35×50	0.15	3.10	EKMQ181VSN272MA50S
200	390	22×25	0.15	1.31	EKMQ201VSN391MP25S
	470	22×30	0.15	1.45	EKMQ201VSN471MP30S
	560	22×30	0.15	1.67	EKMQ201VSN561MP30S
	560	25.4×25	0.15	1.67	EKMQ201VSN561MQ25S
	680	22×40	0.15	1.75	EKMQ201VSN681MP40S
	680	25.4×30	0.15	1.75	EKMQ201VSN681MQ30S
	820	22×45	0.15	2.04	EKMQ201VSN821MP45S
	820	25.4×35	0.15	2.04	EKMQ201VSN821MQ35S
	820	30×25	0.15	2.04	EKMQ201VSN821MR25S
	1,000	22×50	0.15	2.30	EKMQ201VSN102MP50S
	1,000	25.4×45	0.15	2.30	EKMQ201VSN102MQ45S
	1,000	30×30	0.15	2.30	EKMQ201VSN102MR30S
	1,000	35×25	0.15	2.30	EKMQ201VSN102MA25S
	1,200	25.4×50	0.15	2.65	EKMQ201VSN122MQ50S
	1,200	30×35	0.15	2.65	EKMQ201VSN122MR35S
	1,200	35×30	0.15	2.65	EKMQ201VSN122MA30S
	1,500	30×40	0.15	2.80	EKMQ201VSN152MR40S
	1,500	35×30	0.15	2.80	EKMQ201VSN152MA30S
	1,800	30×45	0.15	3.08	EKMQ201VSN182MR45S
	1,800	35×40	0.15	3.08	EKMQ201VSN182MA40S
	2,200	35×45	0.15	3.48	EKMQ201VSN222MA45S
250	220	22×25	0.15	1.00	EKMQ251VSN221MP25S
	270	22×25	0.15	1.10	EKMQ251VSN271MP25S
	330	22×30	0.15	1.20	EKMQ251VSN331MP30S
	330	25.4×25	0.15	1.20	EKMQ251VSN331MQ25S
	390	22×35	0.15	1.30	EKMQ251VSN391MP35S
	390	25.4×25	0.15	1.30	EKMQ251VSN391MQ25S
	470	22×40	0.15	1.40	EKMQ251VSN471MP40S
	470	25.4×30	0.15	1.40	EKMQ251VSN471MQ30S
	470	30×25	0.15	1.40	EKMQ251VSN471MR25S
	560	22×45	0.15	1.50	EKMQ251VSN561MP45S
	560	25.4×35	0.15	1.50	EKMQ251VSN561MQ35S
	560	30×25	0.15	1.50	EKMQ251VSN561MR25S
	680	22×50	0.15	1.70	EKMQ251VSN681MP50S
	680	25.4×40	0.15	1.70	EKMQ251VSN681MQ40S
	680	30×30	0.15	1.70	EKMQ251VSN681MR30S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMQ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
250	680	35×25	0.15	1.70	EKMQ251VSN681MA25S
	820	25.4×45	0.15	2.00	EKMQ251VSN821MQ45S
	820	30×35	0.15	2.00	EKMQ251VSN821MR35S
	820	35×30	0.15	2.00	EKMQ251VSN821MA30S
	1,000	30×40	0.15	2.20	EKMQ251VSN102MR40S
	1,000	35×30	0.15	2.20	EKMQ251VSN102MA30S
	1,200	30×45	0.15	2.30	EKMQ251VSN122MR45S
	1,200	35×35	0.15	2.30	EKMQ251VSN122MA35S
	1,500	35×45	0.15	2.50	EKMQ251VSN152MA45S
	1,800	35×50	0.15	2.70	EKMQ251VSN182MA50S
315	150	22×25	0.15	0.82	EKMQ3B1VSN151MP25S
	180	22×30	0.15	0.90	EKMQ3B1VSN181MP30S
	220	22×30	0.15	1.00	EKMQ3B1VSN221MP30S
	220	25.4×25	0.15	1.00	EKMQ3B1VSN221MQ25S
	270	22×35	0.15	1.10	EKMQ3B1VSN271MP35S
	270	25.4×30	0.15	1.10	EKMQ3B1VSN271MQ30S
	330	22×45	0.15	1.20	EKMQ3B1VSN331MP45S
	330	25.4×35	0.15	1.20	EKMQ3B1VSN331MQ35S
	330	30×25	0.15	1.20	EKMQ3B1VSN331MR25S
	390	22×45	0.15	1.30	EKMQ3B1VSN391MP45S
	390	25.4×40	0.15	1.30	EKMQ3B1VSN391MQ40S
	390	30×30	0.15	1.30	EKMQ3B1VSN391MR30S
	390	35×25	0.15	1.30	EKMQ3B1VSN391MA25S
	470	25.4×45	0.15	1.40	EKMQ3B1VSN471MQ45S
	470	30×35	0.15	1.40	EKMQ3B1VSN471MR35S
	470	35×25	0.15	1.40	EKMQ3B1VSN471MA25S
	560	25.4×50	0.15	1.50	EKMQ3B1VSN561MQ50S
	560	30×40	0.15	1.50	EKMQ3B1VSN561MR40S
	560	35×30	0.15	1.50	EKMQ3B1VSN561MA30S
	680	30×45	0.15	1.70	EKMQ3B1VSN681MR45S
	680	35×35	0.15	1.70	EKMQ3B1VSN681MA35S
	820	30×50	0.15	2.00	EKMQ3B1VSN821MR50S
	820	35×40	0.15	2.00	EKMQ3B1VSN821MA40S
	1,000	35×45	0.15	2.30	EKMQ3B1VSN102MA45S
350	120	22×25	0.15	0.75	EKMQ351VSN121MP25S
	150	22×30	0.15	0.82	EKMQ351VSN151MP30S
	180	22×30	0.15	0.90	EKMQ351VSN181MP30S
	180	25.4×25	0.15	0.90	EKMQ351VSN181MQ25S
	220	22×35	0.15	1.00	EKMQ351VSN221MP35S
	220	25.4×30	0.15	1.00	EKMQ351VSN221MQ30S
	270	22×40	0.15	1.10	EKMQ351VSN271MP40S
	270	25.4×30	0.15	1.10	EKMQ351VSN271MQ30S
	270	30×25	0.15	1.10	EKMQ351VSN271MR25S
	330	22×45	0.15	1.20	EKMQ351VSN331MP45S
	330	25.4×40	0.15	1.20	EKMQ351VSN331MQ40S
	330	30×30	0.15	1.20	EKMQ351VSN331MR30S
	390	25.4×45	0.15	1.30	EKMQ351VSN391MQ45S
	390	30×35	0.15	1.30	EKMQ351VSN391MR35S
	470	25.4×50	0.15	1.40	EKMQ351VSN471MQ50S
	470	30×35	0.15	1.40	EKMQ351VSN471MR35S
	470	35×30	0.15	1.40	EKMQ351VSN471MA30S
	560	30×45	0.15	1.50	EKMQ351VSN561MR45S
	560	35×35	0.15	1.50	EKMQ351VSN561MA35S
	680	30×50	0.15	1.70	EKMQ351VSN681MR50S
	680	35×40	0.15	1.70	EKMQ351VSN681MA40S
	820	35×45	0.15	1.90	EKMQ351VSN821MA45S
400	100	22×25	0.15	0.70	EKMQ401VSN101MP25S
	120	22×30	0.15	0.75	EKMQ401VSN121MP30S
	150	22×30	0.15	0.88	EKMQ401VSN151MP30S
	150	25.4×25	0.15	0.88	EKMQ401VSN151MQ25S
	180	22×35	0.15	0.95	EKMQ401VSN181MP35S
	180	25.4×30	0.15	0.95	EKMQ401VSN181MQ30S
	220	22×45	0.15	1.10	EKMQ401VSN221MP45S
	220	25.4×35	0.15	1.10	EKMQ401VSN221MQ35S
	220	30×25	0.15	1.10	EKMQ401VSN221MR25S
	270	22×50	0.15	1.22	EKMQ401VSN271MP50S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
400	270	25.4×40	0.15	1.22	EKMQ401VSN271MQ40S
	270	30×30	0.15	1.22	EKMQ401VSN271MR30S
	270	35×25	0.15	1.22	EKMQ401VSN271MA25S
	330	25.4×45	0.15	1.44	EKMQ401VSN331MQ45S
	330	30×35	0.15	1.44	EKMQ401VSN331MR35S
	330	35×30	0.15	1.44	EKMQ401VSN331MA30S
	390	25.4×50	0.15	1.55	EKMQ401VSN391MQ50S
	390	30×40	0.15	1.55	EKMQ401VSN391MR40S
	390	35×30	0.15	1.55	EKMQ401VSN391MA30S
	470	30×45	0.15	1.68	EKMQ401VSN471MR45S
	470	35×35	0.15	1.68	EKMQ401VSN471MA35S
	560	30×50	0.15	1.90	EKMQ401VSN561MR50S
	560	35×40	0.15	1.90	EKMQ401VSN561MA40S
	680	35×45	0.15	2.12	EKMQ401VSN681MA45S
420	82	22×25	0.20	0.64	EKMQ421VSN820MP25S
	100	22×25	0.20	0.66	EKMQ421VSN101MP25S
	100	25.4×25	0.20	0.66	EKMQ421VSN101MQ25S
	120	22×30	0.20	0.81	EKMQ421VSN121MP30S
	120	25.4×25	0.20	0.81	EKMQ421VSN121MQ25S
	150	22×35	0.20	0.84	EKMQ421VSN151MP35S
	150	25.4×30	0.20	0.84	EKMQ421VSN151MQ30S
	150	30×25	0.20	0.84	EKMQ421VSN151MR25S
	180	22×40	0.20	0.91	EKMQ421VSN181MP40S
	180	25.4×30	0.20	0.91	EKMQ421VSN181MQ30S
	180	30×25	0.20	0.91	EKMQ421VSN181MR25S
	220	22×45	0.20	1.05	EKMQ421VSN221MP45S
	220	25.4×35	0.20	1.05	EKMQ421VSN221MQ35S
	220	30×30	0.20	1.05	EKMQ421VSN221MR30S
	220	35×25	0.20	1.05	EKMQ421VSN221MA25S
	270	25.4×40	0.20	1.25	EKMQ421VSN271MQ40S
	270	30×30	0.20	1.25	EKMQ421VSN271MR30S
	270	35×25	0.20	1.25	EKMQ421VSN271MA25S
	330	25.4×50	0.20	1.42	EKMQ421VSN331MQ50S
	330	30×35	0.20	1.42	EKMQ421VSN331MR35S
	330	35×30	0.20	1.42	EKMQ421VSN331MA30S
	390	30×40	0.20	1.61	EKMQ421VSN391MR40S
	390	35×35	0.20	1.61	EKMQ421VSN391MA35S
	470	30×45	0.20	1.86	EKMQ421VSN471MR45S
	470	35×40	0.20	1.86	EKMQ421VSN471MA40S
	560	35×45	0.20	2.10	EKMQ421VSN561MA45S
	680	35×50	0.20	2.20	EKMQ421VSN681MA50S
450	68	22×25	0.20	0.50	EKMQ451VSN680MP25S
	82	22×30	0.20	0.56	EKMQ451VSN820MP30S
	100	22×30	0.20	0.64	EKMQ451VSN101MP30S
	100	25.4×25	0.20	0.64	EKMQ451VSN101MQ25S
	120	22×35	0.20	0.72	EKMQ451VSN121MP35S
	120	25.4×30	0.20	0.72	EKMQ451VSN121MQ30S
	150	22×40	0.20	0.79	EKMQ451VSN151MP40S
	150	25.4×30	0.20	0.79	EKMQ451VSN151MQ30S
	150	30×25	0.20	0.79	EKMQ451VSN151MR25S
	180	22×45	0.20	0.87	EKMQ451VSN181MP45S
	180	25.4×40	0.20	0.87	EKMQ451VSN181MQ40S
	180	30×30	0.20	0.87	EKMQ451VSN181MR30S
	220	25.4×45	0.20	1.00	EKMQ451VSN221MQ45S
	220	30×30	0.20	1.00	EKMQ451VSN221MR30S
	220	35×25	0.20	1.00	EKMQ451VSN221MA25S
	270	25.4×50	0.20	1.19	EKMQ451VSN271MQ50S
	270	30×40	0.20	1.19	EKMQ451VSN271MR40S
	270	35×30	0.20	1.19	EKMQ451VSN271MA30S
	330	30×45	0.20	1.38	EKMQ451VSN331MR45S
	330	35×35	0.20	1.38	EKMQ451VSN331MA35S
	390	30×50	0.20	1.55	EKMQ451VSN391MR50S
	390	35×40	0.20	1.55	EKMQ451VSN391MA40S
	470	35×45	0.20	1.74	EKMQ451VSN471MA45S
	560	35×50	0.20	1.90	EKMQ451VSN561MA50S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMQ Series

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency(Hz)	50	120	300	1k	10k	50k
35, 50Vdc	0.95	1.00	1.03	1.05	1.08	1.08
160 to 250Vdc	0.81	1.00	1.17	1.32	1.45	1.50
315 to 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 85℃

SMM Series

- Downsize, longer life, and high ripple version of SMH series
- Endurance with ripple current : 3,000 hours at 85℃
- Non solvent resistant type
- **RoHS Compliant**

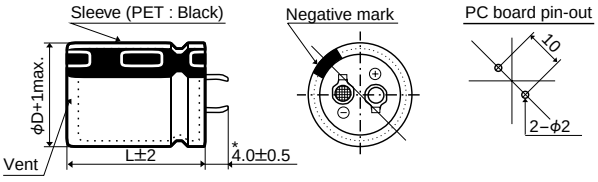
SMM
↑ Downsized, Longer life, Higher ripple
SMH

◆SPECIFICATIONS

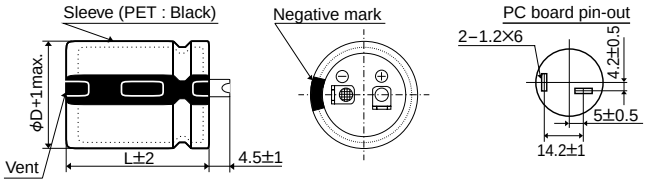
Items	Characteristics			
Category Temperature Range	−25 to +85℃			
Rated Voltage Range	160 to 450Vdc			
Capacitance Tolerance	±20% (M)			(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)			(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 400V	420 & 450V	
	tanδ (Max.)	0.15	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 400V	420 & 450V	
	Z(−25℃)/Z(+20℃)	4	8	(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 3,000 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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.			
	Capacitance change	≦±15% of the initial value		
	D.F. (tanδ)	≦150% of the initial specified value		
	Leakage current	≦The initial specified value		

◆DIMENSIONS [mm]

●Terminal Code : VS (φ20 to φ35) : Standard



●Terminal Code : LI (φ35)



*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

◆PART NUMBERING SYSTEM

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

- 18 : Supplement code
- 15–17 : Size code
- 14 : Capacitance tolerance code
- 11–13 : Capacitance code (ex. 330μF:331, 3,300μF:332)
- 10 : Dummy terminal code
- 8–9 : Terminal code (VS, LI)
- 5–7 : Voltage code (ex. 160V:161, 315V:3B1, 450V:451)
- 2–4 : Series code
- 1 : Category

Please refer to "Product code guide (snap-in type)"

◆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
315 to 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

The endurance of capacitors is reduced 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.

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 85℃

SMM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
160	270	20×25	0.15	1.28	ESMM161VSN271MN25S
	270	22×20	0.15	1.30	ESMM161VSN271MP20S
	330	20×25	0.15	1.55	ESMM161VSN331MN25S
	390	20×30	0.15	1.63	ESMM161VSN391MN30S
	390	22×25	0.15	1.63	ESMM161VSN391MP25S
	390	25.4×20	0.15	1.62	ESMM161VSN391MQ20S
	470	20×30	0.15	1.90	ESMM161VSN471MN30S
	470	22×30	0.15	1.86	ESMM161VSN471MP30S
	470	25.4×25	0.15	1.86	ESMM161VSN471MQ25S
	560	20×35	0.15	2.14	ESMM161VSN561MN35S
	560	22×30	0.15	2.15	ESMM161VSN561MP30S
	560	25.4×25	0.15	2.15	ESMM161VSN561MQ25S
	560	30×20	0.15	2.05	ESMM161VSN561MR20S
	680	20×40	0.15	2.35	ESMM161VSN681MN40S
	680	22×35	0.15	2.35	ESMM161VSN681MP35S
	680	25.4×30	0.15	2.33	ESMM161VSN681MQ30S
	680	30×25	0.15	2.33	ESMM161VSN681MR25S
	680	35×20	0.15	2.26	ESMM161VSN681MA20S
	820	20×45	0.15	2.64	ESMM161VSN821MN45S
	820	22×40	0.15	2.68	ESMM161VSN821MP40S
	820	25.4×30	0.15	2.65	ESMM161VSN821MQ30S
	820	30×25	0.15	2.64	ESMM161VSN821MR25S
	820	35×20	0.15	2.49	ESMM161VSN821MA20S
	1,000	22×45	0.15	3.02	ESMM161VSN102MP45S
	1,000	25.4×35	0.15	3.00	ESMM161VSN102MQ35S
	1,000	30×30	0.15	2.96	ESMM161VSN102MR30S
	1,000	35×25	0.15	3.13	ESMM161VSN102MA25S
	1,200	22×50	0.15	3.47	ESMM161VSN122MP50S
	1,200	25.4×40	0.15	3.43	ESMM161VSN122MQ40S
	1,200	30×30	0.15	3.41	ESMM161VSN122MR30S
	1,200	35×25	0.15	3.40	ESMM161VSN122MA25S
	1,500	25.4×50	0.15	3.96	ESMM161VSN152MQ50S
	1,500	30×35	0.15	3.96	ESMM161VSN152MR35S
	1,500	35×30	0.15	3.94	ESMM161VSN152MA30S
	1,800	30×40	0.15	4.31	ESMM161VSN182MR40S
	1,800	35×35	0.15	4.28	ESMM161VSN182MA35S
	2,200	30×50	0.15	4.96	ESMM161VSN222MR50S
	2,200	35×40	0.15	4.96	ESMM161VSN222MA40S
	2,700	35×45	0.15	5.57	ESMM161VSN272MA45S
	3,300	35×50	0.15	6.21	ESMM161VSN332MA50S
180	220	22×20	0.15	1.18	ESMM181VSN221MP20S
	270	20×25	0.15	1.29	ESMM181VSN271MN25S
	330	20×30	0.15	1.77	ESMM181VSN331MN30S
	330	22×25	0.15	1.77	ESMM181VSN331MP25S
	330	25.4×20	0.15	1.49	ESMM181VSN331MQ20S
	390	20×30	0.15	1.84	ESMM181VSN391MN30S
	390	22×25	0.15	1.84	ESMM181VSN391MP25S
	470	20×35	0.15	1.91	ESMM181VSN471MN35S
	470	22×30	0.15	1.91	ESMM181VSN471MP30S
	470	25.4×25	0.15	2.08	ESMM181VSN471MQ25S
	470	30×20	0.15	1.88	ESMM181VSN471MR20S
	560	20×40	0.15	2.15	ESMM181VSN561MN40S
	560	22×35	0.15	2.25	ESMM181VSN561MP35S
	560	25.4×25	0.15	2.25	ESMM181VSN561MQ25S
	680	20×45	0.15	2.41	ESMM181VSN681MN45S
	680	22×35	0.15	2.48	ESMM181VSN681MP35S
	680	25.4×30	0.15	2.50	ESMM181VSN681MQ30S
	680	30×25	0.15	2.46	ESMM181VSN681MR25S
	680	35×20	0.15	2.26	ESMM181VSN681MA20S
	820	20×50	0.15	2.72	ESMM181VSN821MN50S
	820	22×40	0.15	2.86	ESMM181VSN821MP40S
	820	25.4×35	0.15	2.75	ESMM181VSN821MQ35S
	820	30×25	0.15	2.69	ESMM181VSN821MR25S
	1,000	22×50	0.15	3.10	ESMM181VSN102MP50S
	1,000	25.4×40	0.15	3.06	ESMM181VSN102MQ40S
	1,000	30×30	0.15	3.10	ESMM181VSN102MR30S
	1,000	35×25	0.15	2.98	ESMM181VSN102MA25S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
180	1,200	25.4×45	0.15	3.63	ESMM181VSN122MQ45S
	1,200	30×35	0.15	3.55	ESMM181VSN122MR35S
	1,200	35×30	0.15	3.49	ESMM181VSN122MA30S
	1,500	30×40	0.15	4.10	ESMM181VSN152MR40S
	1,500	35×35	0.15	4.02	ESMM181VSN152MA35S
	1,800	30×45	0.15	4.55	ESMM181VSN182MR45S
	1,800	35×35	0.15	4.54	ESMM181VSN182MA35S
	2,200	35×40	0.15	4.83	ESMM181VSN222MA40S
	2,700	35×50	0.15	5.30	ESMM181VSN272MA50S
200	220	20×25	0.15	1.19	ESMM201VSN221MN25S
	220	22×20	0.15	1.18	ESMM201VSN221MP20S
	270	20×25	0.15	1.39	ESMM201VSN271MN25S
	270	22×25	0.15	1.37	ESMM201VSN271MP25S
	270	25.4×20	0.15	1.35	ESMM201VSN271MQ20S
	330	20×30	0.15	1.56	ESMM201VSN331MN30S
	330	22×25	0.15	1.51	ESMM201VSN331MP25S
	330	25.4×20	0.15	1.49	ESMM201VSN331MQ20S
	390	20×35	0.15	1.74	ESMM201VSN391MN35S
	390	22×30	0.15	1.73	ESMM201VSN391MP30S
	390	25.4×25	0.15	1.71	ESMM201VSN391MQ25S
	390	30×20	0.15	1.71	ESMM201VSN391MR20S
	470	20×35	0.15	2.03	ESMM201VSN471MN35S
	470	22×30	0.15	1.97	ESMM201VSN471MP30S
	470	25.4×25	0.15	1.95	ESMM201VSN471MQ25S
	470	30×20	0.15	1.88	ESMM201VSN471MR20S
	560	20×40	0.15	2.18	ESMM201VSN561MN40S
	560	22×35	0.15	2.18	ESMM201VSN561MP35S
	560	25.4×30	0.15	2.15	ESMM201VSN561MQ30S
	560	30×25	0.15	2.15	ESMM201VSN561MR25S
	560	35×20	0.15	2.05	ESMM201VSN561MA20S
	680	20×50	0.15	2.48	ESMM201VSN681MN50S
	680	22×40	0.15	2.48	ESMM201VSN681MP40S
	680	25.4×30	0.15	2.48	ESMM201VSN681MQ30S
	680	30×25	0.15	2.48	ESMM201VSN681MR25S
	680	35×20	0.15	2.36	ESMM201VSN681MA20S
	820	22×45	0.15	2.81	ESMM201VSN821MP45S
	820	25.4×35	0.15	2.79	ESMM201VSN821MQ35S
	820	30×30	0.15	2.80	ESMM201VSN821MR30S
	820	35×25	0.15	2.83	ESMM201VSN821MA25S
	1,000	22×50	0.15	3.28	ESMM201VSN102MP50S
	1,000	25.4×40	0.15	3.28	ESMM201VSN102MQ40S
	1,000	30×35	0.15	3.15	ESMM201VSN102MR35S
	1,000	35×30	0.15	3.26	ESMM201VSN102MA30S
	1,200	25.4×45	0.15	3.61	ESMM201VSN122MQ45S
	1,200	30×35	0.15	3.61	ESMM201VSN122MR35S
	1,200	35×30	0.15	3.57	ESMM201VSN122MA30S
	1,500	30×45	0.15	4.13	ESMM201VSN152MR45S
	1,500	35×35	0.15	4.06	ESMM201VSN152MA35S
	1,800	30×50	0.15	4.60	ESMM201VSN182MR50S
	1,800	35×40	0.15	4.59	ESMM201VSN182MA40S
	2,200	35×45	0.15	5.25	ESMM201VSN222MA45S
220	180	22×20	0.15	1.06	ESMM221VSN181MP20S
	220	20×25	0.15	1.25	ESMM221VSN221MN25S
	270	20×30	0.15	1.46	ESMM221VSN271MN30S
	270	22×25	0.15	1.47	ESMM221VSN271MP25S
	270	25.4×20	0.15	1.35	ESMM221VSN271MQ20S
	330	20×35	0.15	1.64	ESMM221VSN331MN35S
	330	22×30	0.15	1.70	ESMM221VSN331MP30S
	330	25.4×25	0.15	1.69	ESMM221VSN331MQ25S
	330	30×20	0.15	1.58	ESMM221VSN331MR20S
	390	20×35	0.15	1.84	ESMM221VSN391MN35S
	390	22×30	0.15	1.89	ESMM221VSN391MP30S
	390	25.4×25	0.15	1.84	ESMM221VSN391MQ25S
	390	30×20	0.15	1.71	ESMM221VSN391MR20S
	470	20×40	0.15	2.12	ESMM221VSN471MN40S
	470	22×35	0.15	2.08	ESMM221VSN471MP35S
	470	25.4×30	0.15	2.08	ESMM221VSN471MQ30S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 85℃

SMM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
220	470	30×25	0.15	2.12	ESMM221VSN471MR25S
	470	35×20	0.15	1.88	ESMM221VSN471MA20S
	560	20×50	0.15	2.33	ESMM221VSN561MN50S
	560	22×40	0.15	2.33	ESMM221VSN561MP40S
	560	25.4×35	0.15	2.38	ESMM221VSN561MQ35S
	560	30×25	0.15	2.31	ESMM221VSN561MR25S
	560	35×20	0.15	2.14	ESMM221VSN561MA20S
	680	22×45	0.15	2.63	ESMM221VSN681MP45S
	680	25.4×35	0.15	2.68	ESMM221VSN681MQ35S
	680	30×30	0.15	2.62	ESMM221VSN681MR30S
	680	35×25	0.15	2.58	ESMM221VSN681MA25S
	820	25.4×45	0.15	3.01	ESMM221VSN821MQ45S
	820	30×35	0.15	2.99	ESMM221VSN821MR35S
	820	35×30	0.15	2.79	ESMM221VSN821MA30S
	1,000	25.4×50	0.15	3.40	ESMM221VSN102MQ50S
	1,000	30×35	0.15	3.42	ESMM221VSN102MR35S
	1,000	35×30	0.15	3.29	ESMM221VSN102MA30S
	1,200	30×40	0.15	3.88	ESMM221VSN122MR40S
	1,200	35×35	0.15	3.68	ESMM221VSN122MA35S
	1,500	30×50	0.15	4.44	ESMM221VSN152MR50S
	1,500	35×40	0.15	4.10	ESMM221VSN152MA40S
	1,800	35×45	0.15	4.52	ESMM221VSN182MA45S
250	150	22×20	0.15	0.97	ESMM251VSN151MP20S
	180	20×25	0.15	1.20	ESMM251VSN181MN25S
	180	22×20	0.15	1.06	ESMM251VSN181MP20S
	220	20×25	0.15	1.26	ESMM251VSN221MN25S
	220	22×25	0.15	1.24	ESMM251VSN221MP25S
	220	25.4×20	0.15	1.22	ESMM251VSN221MQ20S
	270	20×30	0.15	1.42	ESMM251VSN271MN30S
	270	22×25	0.15	1.50	ESMM251VSN271MP25S
	330	20×35	0.15	1.68	ESMM251VSN331MN35S
	330	22×30	0.15	1.66	ESMM251VSN331MP30S
	330	25.4×25	0.15	1.61	ESMM251VSN331MQ25S
	330	30×20	0.15	1.58	ESMM251VSN331MR20S
	390	20×40	0.15	1.92	ESMM251VSN391MN40S
	390	22×35	0.15	1.88	ESMM251VSN391MP35S
	390	25.4×30	0.15	1.88	ESMM251VSN391MQ30S
	390	30×25	0.15	1.86	ESMM251VSN391MR25S
	390	35×20	0.15	1.71	ESMM251VSN391MA20S
	470	20×50	0.15	2.06	ESMM251VSN471MN50S
	470	22×35	0.15	2.15	ESMM251VSN471MP35S
	470	25.4×35	0.15	2.15	ESMM251VSN471MQ35S
	470	30×25	0.15	2.05	ESMM251VSN471MR25S
	470	35×20	0.15	1.88	ESMM251VSN471MA20S
	560	22×40	0.15	2.48	ESMM251VSN561MP40S
	560	25.4×35	0.15	2.35	ESMM251VSN561MQ35S
	560	30×25	0.15	2.35	ESMM251VSN561MR25S
	680	22×50	0.15	2.61	ESMM251VSN681MP50S
	680	25.4×40	0.15	2.67	ESMM251VSN681MQ40S
	680	30×30	0.15	2.71	ESMM251VSN681MR30S
	680	35×25	0.15	2.58	ESMM251VSN681MA25S
	820	25.4×45	0.15	3.01	ESMM251VSN821MQ45S
	820	30×35	0.15	2.98	ESMM251VSN821MR35S
	820	35×30	0.15	2.96	ESMM251VSN821MA30S
	1,000	30×40	0.15	3.56	ESMM251VSN102MR40S
	1,000	35×35	0.15	3.48	ESMM251VSN102MA35S
	1,200	30×45	0.15	3.99	ESMM251VSN122MR45S
	1,200	35×35	0.15	3.84	ESMM251VSN122MA35S
	1,500	35×40	0.15	4.33	ESMM251VSN152MA40S
	1,800	35×50	0.15	4.54	ESMM251VSN182MA50S
315	100	22×20	0.15	0.79	ESMM3B1VSN101MP20S
	120	20×25	0.15	0.89	ESMM3B1VSN121MN25S
	120	25.4×20	0.15	0.90	ESMM3B1VSN121MQ20S
	150	20×30	0.15	1.05	ESMM3B1VSN151MN30S
	150	22×25	0.15	1.06	ESMM3B1VSN151MP25S
	150	25.4×20	0.15	1.00	ESMM3B1VSN151MQ20S
	180	20×35	0.15	1.18	ESMM3B1VSN181MN35S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
315	180	22×30	0.15	1.29	ESMM3B1VSN181MP30S
	180	25.4×25	0.15	1.38	ESMM3B1VSN181MQ25S
	180	30×20	0.15	1.16	ESMM3B1VSN181MR20S
	220	20×35	0.15	1.30	ESMM3B1VSN221MN35S
	220	22×30	0.15	1.41	ESMM3B1VSN221MP30S
	220	25.4×25	0.15	1.47	ESMM3B1VSN221MQ25S
	220	30×20	0.15	1.28	ESMM3B1VSN221MR20S
	270	20×45	0.15	1.52	ESMM3B1VSN271MN45S
	270	22×35	0.15	1.68	ESMM3B1VSN271MP35S
	270	25.4×30	0.15	1.70	ESMM3B1VSN271MQ30S
	270	30×25	0.15	1.55	ESMM3B1VSN271MR25S
	270	35×20	0.15	1.43	ESMM3B1VSN271MA20S
	330	20×50	0.15	1.73	ESMM3B1VSN331MN50S
	330	22×40	0.15	1.91	ESMM3B1VSN331MP40S
	330	25.4×35	0.15	1.94	ESMM3B1VSN331MQ35S
	330	30×25	0.15	1.98	ESMM3B1VSN331MR25S
	390	22×45	0.15	2.07	ESMM3B1VSN391MP45S
	390	25.4×40	0.15	2.11	ESMM3B1VSN391MQ40S
	390	30×30	0.15	2.15	ESMM3B1VSN391MR30S
	390	35×25	0.15	1.95	ESMM3B1VSN391MA25S
	470	25.4×45	0.15	2.31	ESMM3B1VSN471MQ45S
	470	30×35	0.15	2.38	ESMM3B1VSN471MR35S
	470	35×30	0.15	2.46	ESMM3B1VSN471MA30S
	560	25.4×50	0.15	2.46	ESMM3B1VSN561MQ50S
	560	30×35	0.15	2.63	ESMM3B1VSN561MR35S
	560	35×30	0.15	2.69	ESMM3B1VSN561MA30S
	680	30×45	0.15	2.82	ESMM3B1VSN681MR45S
	680	35×35	0.15	3.05	ESMM3B1VSN681MA35S
	820	30×50	0.15	3.28	ESMM3B1VSN821MR50S
	820	35×40	0.15	3.45	ESMM3B1VSN821MA40S
	1,000	35×45	0.15	3.59	ESMM3B1VSN102MA45S
350	82	22×20	0.15	0.72	ESMM351VSN820MP20S
	100	20×25	0.15	0.81	ESMM351VSN101MN25S
	120	20×30	0.15	0.96	ESMM351VSN121MN30S
	120	22×25	0.15	1.04	ESMM351VSN121MP25S
	120	25.4×20	0.15	0.90	ESMM351VSN121MQ20S
	150	20×30	0.15	1.10	ESMM351VSN151MN30S
	150	22×30	0.15	1.20	ESMM351VSN151MP30S
	150	25.4×25	0.15	1.22	ESMM351VSN151MQ25S
	150	30×20	0.15	1.06	ESMM351VSN151MR20S
	180	20×35	0.15	1.24	ESMM351VSN181MN35S
	180	22×30	0.15	1.34	ESMM351VSN181MP30S
	180	25.4×25	0.15	1.37	ESMM351VSN181MQ25S
	180	30×20	0.15	1.16	ESMM351VSN181MR20S
	220	20×45	0.15	1.37	ESMM351VSN221MN45S
	220	22×35	0.15	1.47	ESMM351VSN221MP35S
	220	25.4×30	0.15	1.53	ESMM351VSN221MQ30S
	220	30×25	0.15	1.54	ESMM351VSN221MR25S
	220	35×20	0.15	1.29	ESMM351VSN221MA20S
	270	20×50	0.15	1.56	ESMM351VSN271MN50S
	270	22×40	0.15	1.70	ESMM351VSN271MP40S
	270	25.4×35	0.15	1.73	ESMM351VSN271MQ35S
	270	30×25	0.15	1.80	ESMM351VSN271MR25S
	270	35×20	0.15	1.49	ESMM351VSN271MA20S
	330	22×45	0.15	1.87	ESMM351VSN331MP45S
	330	25.4×35	0.15	1.97	ESMM351VSN331MQ35S
	330	30×30	0.15	2.03	ESMM351VSN331MR30S
	330	35×25	0.15	1.80	ESMM351VSN331MA25S
	390	25.4×40	0.15	2.14	ESMM351VSN391MQ40S
	390	30×35	0.15	2.23	ESMM351VSN391MR35S
	390	35×30	0.15	2.30	ESMM351VSN391MA30S
	470	25.4×50	0.15	2.55	ESMM351VSN471MQ50S
	470	30×35	0.15	2.53	ESMM351VSN471MR35S
	470	35×30	0.15	2.55	ESMM351VSN471MA30S
	560	30×40	0.15	2.73	ESMM351VSN561MR40S
	560	35×35	0.15	2.75	ESMM351VSN561MA35S
	680	30×50	0.15	3.15	ESMM351VSN681MR50S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 85℃

SMM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
350	680	35×40	0.15	3.15	ESMM351VSN681MA40S
	820	35×45	0.15	3.47	ESMM351VSN821MA45S
	1,000	35×50	0.15	3.60	ESMM351VSN102MA50S
400	68	20×25	0.15	0.75	ESMM401VSN680MN25S
	68	22×20	0.15	0.65	ESMM401VSN680MP20S
	82	20×25	0.15	0.82	ESMM401VSN820MN25S
	82	22×25	0.15	0.84	ESMM401VSN820MP25S
	82	25.4×20	0.15	0.74	ESMM401VSN820MQ20S
	100	20×30	0.15	0.95	ESMM401VSN101MN30S
	100	22×25	0.15	0.99	ESMM401VSN101MP25S
	100	25.4×20	0.15	0.82	ESMM401VSN101MQ20S
	120	20×35	0.15	1.07	ESMM401VSN121MN35S
	120	22×30	0.15	1.09	ESMM401VSN121MP30S
	120	25.4×25	0.15	1.13	ESMM401VSN121MQ25S
	120	30×20	0.15	0.95	ESMM401VSN121MR20S
	150	20×40	0.15	1.22	ESMM401VSN151MN40S
	150	22×35	0.15	1.24	ESMM401VSN151MP35S
	150	25.4×30	0.15	1.27	ESMM401VSN151MQ30S
	150	30×25	0.15	1.20	ESMM401VSN151MR25S
	180	20×45	0.15	1.28	ESMM401VSN181MN45S
	180	22×40	0.15	1.41	ESMM401VSN181MP40S
	180	25.4×30	0.15	1.44	ESMM401VSN181MQ30S
	180	30×25	0.15	1.52	ESMM401VSN181MR25S
	180	35×20	0.15	1.16	ESMM401VSN181MA20S
	220	20×50	0.15	1.41	ESMM401VSN221MN50S
	220	22×45	0.15	1.58	ESMM401VSN221MP45S
	220	25.4×35	0.15	1.64	ESMM401VSN221MQ35S
	220	30×30	0.15	1.66	ESMM401VSN221MR30S
	220	35×25	0.15	1.47	ESMM401VSN221MA25S
	270	22×50	0.15	1.65	ESMM401VSN271MP50S
	270	25.4×40	0.15	1.79	ESMM401VSN271MQ40S
	270	30×30	0.15	1.82	ESMM401VSN271MR30S
	270	35×25	0.15	1.63	ESMM401VSN271MA25S
	330	25.4×45	0.15	2.00	ESMM401VSN331MQ45S
	330	30×35	0.15	2.05	ESMM401VSN331MR35S
	330	35×30	0.15	2.05	ESMM401VSN331MA30S
	390	25.4×50	0.15	2.12	ESMM401VSN391MQ50S
	390	30×40	0.15	2.26	ESMM401VSN391MR40S
	390	35×35	0.15	2.28	ESMM401VSN391MA35S
	470	30×45	0.15	2.51	ESMM401VSN471MR45S
	470	35×35	0.15	2.54	ESMM401VSN471MA35S
	560	30×50	0.15	2.85	ESMM401VSN561MR50S
	560	35×40	0.15	2.85	ESMM401VSN561MA40S
	680	35×50	0.15	3.10	ESMM401VSN681MA50S
420	47	22×20	0.20	0.54	ESMM421VSN470MP20S
	56	20×25	0.20	0.58	ESMM421VSN560MN25S
	56	22×20	0.20	0.59	ESMM421VSN560MP20S
	68	20×25	0.20	0.70	ESMM421VSN680MN25S
	68	25.4×20	0.20	0.68	ESMM421VSN680MQ20S
	82	20×30	0.20	0.80	ESMM421VSN820MN30S
	82	22×25	0.20	0.85	ESMM421VSN820MP25S
	82	25.4×20	0.20	0.74	ESMM421VSN820MQ20S
	100	20×35	0.20	0.90	ESMM421VSN101MN35S
	100	22×30	0.20	0.97	ESMM421VSN101MP30S
	100	25.4×25	0.20	0.98	ESMM421VSN101MQ25S
	100	30×20	0.20	0.87	ESMM421VSN101MR20S
	120	20×35	0.20	1.04	ESMM421VSN121MN35S
	120	22×30	0.20	1.07	ESMM421VSN121MP30S
	120	25.4×25	0.20	1.08	ESMM421VSN121MQ25S
	120	30×20	0.20	0.95	ESMM421VSN121MR20S
	150	20×40	0.20	1.17	ESMM421VSN151MN40S
	150	22×35	0.20	1.21	ESMM421VSN151MP35S
	150	25.4×30	0.20	1.26	ESMM421VSN151MQ30S
	150	30×25	0.20	1.30	ESMM421VSN151MR25S
	150	35×20	0.20	1.11	ESMM421VSN151MA20S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
420	180	20×50	0.20	1.27	ESMM421VSN181MN50S
	180	22×40	0.20	1.33	ESMM421VSN181MP40S
	180	25.4×35	0.20	1.42	ESMM421VSN181MQ35S
	180	30×25	0.20	1.48	ESMM421VSN181MR25S
	180	35×20	0.20	1.16	ESMM421VSN181MA20S
	220	22×45	0.20	1.55	ESMM421VSN221MP45S
	220	25.4×35	0.20	1.58	ESMM421VSN221MQ35S
	220	30×30	0.20	1.65	ESMM421VSN221MR30S
	220	35×25	0.20	1.47	ESMM421VSN221MA25S
	270	25.4×40	0.20	1.74	ESMM421VSN271MQ40S
	270	30×35	0.20	1.90	ESMM421VSN271MR35S
	270	35×30	0.20	1.94	ESMM421VSN271MA30S
	330	25.4×50	0.20	2.20	ESMM421VSN331MQ50S
	330	30×35	0.20	1.98	ESMM421VSN331MR35S
	330	35×35	0.20	2.17	ESMM421VSN331MA35S
	390	30×40	0.20	2.22	ESMM421VSN391MR40S
	390	35×35	0.20	2.27	ESMM421VSN391MA35S
	470	30×45	0.20	2.50	ESMM421VSN471MR45S
	470	35×40	0.20	2.61	ESMM421VSN471MA40S
	560	35×45	0.20	2.95	ESMM421VSN561MA45S
	680	35×50	0.20	3.15	ESMM421VSN681MA50S
450	47	22×20	0.20	0.54	ESMM451VSN470MP20S
	56	20×25	0.20	0.61	ESMM451VSN560MN25S
	56	22×20	0.20	0.59	ESMM451VSN560MP20S
	68	20×30	0.20	0.71	ESMM451VSN680MN30S
	68	22×25	0.20	0.71	ESMM451VSN680MP25S
	68	25.4×20	0.20	0.68	ESMM451VSN680MQ20S
	82	20×35	0.20	0.80	ESMM451VSN820MN35S
	82	22×25	0.20	0.86	ESMM451VSN820MP25S
	82	25.4×20	0.20	0.74	ESMM451VSN820MQ20S
	82	30×20	0.20	0.79	ESMM451VSN820MR20S
	100	20×35	0.20	0.88	ESMM451VSN101MN35S
	100	22×30	0.20	0.95	ESMM451VSN101MP30S
	100	25.4×25	0.20	0.97	ESMM451VSN101MQ25S
	100	30×20	0.20	0.87	ESMM451VSN101MR20S
	120	20×40	0.20	0.99	ESMM451VSN121MN40S
	120	22×35	0.20	1.07	ESMM451VSN121MP35S
	120	25.4×30	0.20	1.09	ESMM451VSN121MQ30S
	120	30×25	0.20	1.12	ESMM451VSN121MR25S
	120	35×20	0.20	0.99	ESMM451VSN121MA20S
	150	20×45	0.20	1.13	ESMM451VSN151MN45S
	150	22×40	0.20	1.18	ESMM451VSN151MP40S
	150	25.4×30	0.20	1.25	ESMM451VSN151MQ30S
	150	30×25	0.20	1.29	ESMM451VSN151MR25S
	150	35×20	0.20	1.06	ESMM451VSN151MA20S
	180	22×45	0.20	1.32	ESMM451VSN181MP45S
	180	25.4×35	0.20	1.40	ESMM451VSN181MQ35S
	180	30×30	0.20	1.45	ESMM451VSN181MR30S
	180	35×25	0.20	1.33	ESMM451VSN181MA25S
	220	22×50	0.20	1.48	ESMM451VSN221MP50S
	220	25.4×40	0.20	1.59	ESMM451VSN221MQ40S
	220	30×30	0.20	1.64	ESMM451VSN221MR30S
	220	35×25	0.20	1.66	ESMM451VSN221MA25S
	270	25.4×45	0.20	1.73	ESMM451VSN271MQ45S
	270	30×35	0.20	1.89	ESMM451VSN271MR35S
	270	35×30	0.20	1.90	ESMM451VSN271MA30S
	330	25.4×50	0.20	2.12	ESMM451VSN331MQ50S
	330	30×40	0.20	2.12	ESMM451VSN331MR40S
	330	35×35	0.20	2.15	ESMM451VSN331MA35S
	390	30×45	0.20	2.35	ESMM451VSN391MR45S
	390	35×40	0.20	2.38	ESMM451VSN391MA40S
	470	30×50	0.20	2.65	ESMM451VSN471MR50S
	470	35×45	0.20	2.68	ESMM451VSN471MA45S
	560	35×50	0.20	2.88	ESMM451VSN561MA50S

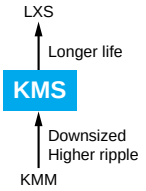
NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMS Series

- Longer life than current snap-ins KMQ series
- Downsized from current downsized snap-ins KMM series
- Endurance with ripple current : 105℃ 3,000 hours
- Rated voltage range : 160 to 450V
- Capacitance range : 82 to 3,300μF
- Non solvent resistant type
- **RoHS Compliant**

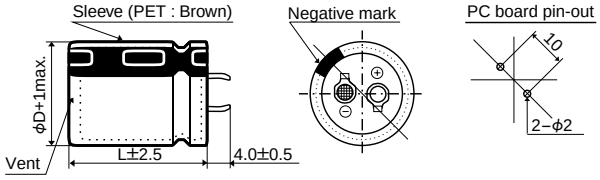


◆SPECIFICATIONS

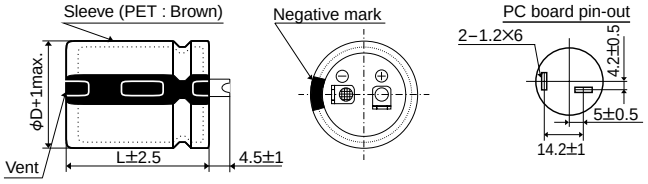
Items	Characteristics			
Category Temperature Range	−25 to +105℃			
Rated Voltage Range	160 to 450Vdc			
Capacitance Tolerance	±20% (M)			(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)			(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 400V	420 & 450V	
	tanδ (Max.)	0.15	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 400V	420 & 450V	
	Z(−25℃)/Z(+20℃)	4	8	(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 3,000 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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.			
	Capacitance change	≦±15% of the initial value		
	D.F. (tanδ)	≦150% of the initial specified value		
	Leakage current	≦The initial specified value		

◆DIMENSIONS [mm]

●Terminal Code : VS (φ22 to φ35) : Standard

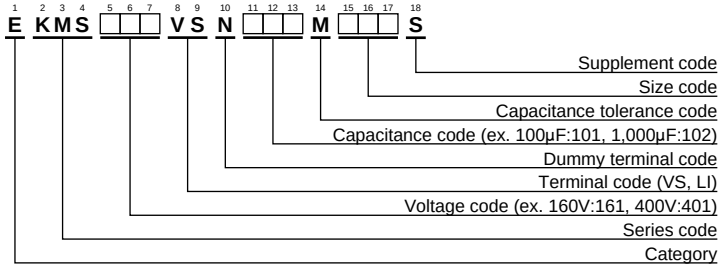


●Terminal Code : LI (φ35)



The standard design has no plastic disc.

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMS Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
160	470	22 × 25	0.15	1.47	EKMS161VSN471MP25S
	680	22 × 30	0.15	1.86	EKMS161VSN681MP30S
	680	25.4 × 25	0.15	1.84	EKMS161VSN681MQ25S
	820	22 × 35	0.15	2.09	EKMS161VSN821MP35S
	820	25.4 × 30	0.15	2.08	EKMS161VSN821MQ30S
	1,000	22 × 40	0.15	2.35	EKMS161VSN102MP40S
	1,000	22 × 45	0.15	2.40	EKMS161VSN102MP45S
	1,000	25.4 × 35	0.15	2.40	EKMS161VSN102MQ35S
	1,000	30 × 25	0.15	2.50	EKMS161VSN102MR25S
	1,200	22 × 50	0.15	2.69	EKMS161VSN122MP50S
	1,200	25.4 × 40	0.15	2.68	EKMS161VSN122MQ40S
	1,200	30 × 30	0.15	2.77	EKMS161VSN122MR30S
	1,200	35 × 25	0.15	2.91	EKMS161VSN122MA25S
	1,500	25.4 × 45	0.15	3.05	EKMS161VSN152MQ45S
	1,500	30 × 35	0.15	3.17	EKMS161VSN152MR35S
	1,800	25.4 × 50	0.15	3.40	EKMS161VSN182MQ50S
	1,800	30 × 40	0.15	3.57	EKMS161VSN182MR40S
	1,800	35 × 30	0.15	3.62	EKMS161VSN182MA30S
	2,200	30 × 45	0.15	4.05	EKMS161VSN222MR45S
	2,200	35 × 35	0.15	4.07	EKMS161VSN222MA35S
	2,700	30 × 50	0.15	4.56	EKMS161VSN272MR50S
	2,700	35 × 40	0.15	4.67	EKMS161VSN272MA40S
	2,700	35 × 45	0.15	4.78	EKMS161VSN272MA45S
	3,300	35 × 50	0.15	5.40	EKMS161VSN332MA50S
180	390	22 × 25	0.15	1.34	EKMS181VSN391MP25S
	560	22 × 30	0.15	1.68	EKMS181VSN561MP30S
	560	25.4 × 25	0.15	1.67	EKMS181VSN561MQ25S
	680	22 × 35	0.15	1.90	EKMS181VSN681MP35S
	820	22 × 40	0.15	2.13	EKMS181VSN821MP40S
	820	25.4 × 30	0.15	2.08	EKMS181VSN821MQ30S
	820	30 × 25	0.15	2.26	EKMS181VSN821MR25S
	1,000	22 × 45	0.15	2.40	EKMS181VSN102MP45S
	1,000	22 × 50	0.15	2.45	EKMS181VSN102MP50S
	1,000	25.4 × 35	0.15	2.40	EKMS181VSN102MQ35S
	1,000	25.4 × 40	0.15	2.45	EKMS181VSN102MQ40S
	1,000	30 × 30	0.15	2.52	EKMS181VSN102MR30S
	1,200	25.4 × 45	0.15	2.73	EKMS181VSN122MQ45S
	1,200	30 × 35	0.15	2.83	EKMS181VSN122MR35S
	1,200	35 × 25	0.15	2.91	EKMS181VSN122MA25S
	1,500	25.4 × 50	0.15	3.10	EKMS181VSN152MQ50S
	1,500	30 × 40	0.15	3.26	EKMS181VSN152MR40S
	1,500	35 × 30	0.15	3.31	EKMS181VSN152MA30S
	1,800	30 × 45	0.15	3.66	EKMS181VSN182MR45S
	1,800	35 × 35	0.15	3.68	EKMS181VSN182MA35S
	2,200	30 × 50	0.15	4.11	EKMS181VSN222MR50S
	2,200	35 × 40	0.15	4.22	EKMS181VSN222MA40S
	2,700	35 × 45	0.15	4.78	EKMS181VSN272MA45S
	2,700	35 × 50	0.15	4.88	EKMS181VSN272MA50S
200	390	22 × 25	0.15	1.34	EKMS201VSN391MP25S
	470	22 × 30	0.15	1.54	EKMS201VSN471MP30S
	560	22 × 35	0.15	1.72	EKMS201VSN561MP35S
	560	25.4 × 25	0.15	1.67	EKMS201VSN561MQ25S
	680	22 × 40	0.15	1.94	EKMS201VSN681MP40S
	680	25.4 × 30	0.15	1.89	EKMS201VSN681MQ30S
	820	22 × 45	0.15	2.17	EKMS201VSN821MP45S
	820	25.4 × 35	0.15	2.17	EKMS201VSN821MQ35S
	820	30 × 25	0.15	2.26	EKMS201VSN821MR25S
	1,000	22 × 50	0.15	2.45	EKMS201VSN102MP50S
	1,000	25.4 × 40	0.15	2.45	EKMS201VSN102MQ40S
	1,000	30 × 30	0.15	2.52	EKMS201VSN102MR30S
	1,000	35 × 25	0.15	2.66	EKMS201VSN102MA25S
	1,200	25.4 × 45	0.15	2.73	EKMS201VSN122MQ45S
	1,200	25.4 × 50	0.15	2.78	EKMS201VSN122MQ50S
	1,200	30 × 35	0.15	2.83	EKMS201VSN122MR35S
	1,200	35 × 30	0.15	2.96	EKMS201VSN122MA30S
	1,500	30 × 40	0.15	3.26	EKMS201VSN152MR40S
	1,500	35 × 35	0.15	3.36	EKMS201VSN152MA35S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
200	1,800	30 × 45	0.15	3.66	EKMS201VSN182MR45S
	1,800	30 × 50	0.15	3.72	EKMS201VSN182MR50S
	1,800	35 × 40	0.15	3.81	EKMS201VSN182MA40S
	2,200	35 × 45	0.15	4.32	EKMS201VSN222MA45S
	2,700	35 × 50	0.15	4.88	EKMS201VSN272MA50S
250	270	22 × 25	0.15	1.11	EKMS251VSN271MP25S
	330	22 × 30	0.15	1.29	EKMS251VSN331MP30S
	390	22 × 35	0.15	1.44	EKMS251VSN391MP35S
	390	25.4 × 25	0.15	1.40	EKMS251VSN391MQ25S
	470	22 × 40	0.15	1.61	EKMS251VSN471MP40S
	470	25.4 × 30	0.15	1.57	EKMS251VSN471MQ30S
	560	22 × 45	0.15	1.79	EKMS251VSN561MP45S
	560	25.4 × 35	0.15	1.79	EKMS251VSN561MQ35S
	560	30 × 25	0.15	1.87	EKMS251VSN561MR25S
	680	22 × 50	0.15	2.02	EKMS251VSN681MP50S
	680	25.4 × 40	0.15	2.02	EKMS251VSN681MQ40S
	680	30 × 30	0.15	2.08	EKMS251VSN681MR30S
	680	35 × 25	0.15	2.19	EKMS251VSN681MA25S
	820	25.4 × 45	0.15	2.26	EKMS251VSN821MQ45S
	820	30 × 35	0.15	2.34	EKMS251VSN821MR35S
	1,000	25.4 × 50	0.15	2.53	EKMS251VSN102MQ50S
	1,000	30 × 40	0.15	2.66	EKMS251VSN102MR40S
	1,000	35 × 30	0.15	2.70	EKMS251VSN102MA30S
	1,200	30 × 45	0.15	2.99	EKMS251VSN122MR45S
	1,200	30 × 50	0.15	3.04	EKMS251VSN122MR50S
	1,200	35 × 35	0.15	3.00	EKMS251VSN122MA35S
	1,500	35 × 40	0.15	3.48	EKMS251VSN152MA40S
	1,500	35 × 45	0.15	3.56	EKMS251VSN152MA45S
	1,800	35 × 50	0.15	3.98	EKMS251VSN182MA50S
315	180	22 × 25	0.15	0.95	EKMS3B1VSN181MP25S
	220	22 × 30	0.15	1.10	EKMS3B1VSN221MP30S
	220	25.4 × 25	0.15	1.10	EKMS3B1VSN221MQ25S
	270	22 × 35	0.15	1.24	EKMS3B1VSN271MP35S
	330	22 × 40	0.15	1.40	EKMS3B1VSN331MP40S
	330	25.4 × 30	0.15	1.38	EKMS3B1VSN331MQ30S
	330	30 × 25	0.15	1.43	EKMS3B1VSN331MR25S
	390	22 × 45	0.15	1.56	EKMS3B1VSN391MP45S
	390	22 × 50	0.15	1.59	EKMS3B1VSN391MP50S
	390	25.4 × 35	0.15	1.57	EKMS3B1VSN391MQ35S
	470	25.4 × 40	0.15	1.76	EKMS3B1VSN471MQ40S
	470	30 × 30	0.15	1.73	EKMS3B1VSN471MR30S
	470	35 × 25	0.15	1.82	EKMS3B1VSN471MA25S
	560	25.4 × 45	0.15	1.96	EKMS3B1VSN561MQ45S
	560	25.4 × 50	0.15	1.99	EKMS3B1VSN561MQ50S
	560	30 × 35	0.15	1.93	EKMS3B1VSN561MR35S
	560	35 × 30	0.15	2.02	EKMS3B1VSN561MA30S
	680	30 × 40	0.15	2.19	EKMS3B1VSN681MR40S
	680	35 × 35	0.15	2.26	EKMS3B1VSN681MA35S
	820	30 × 45	0.15	2.47	EKMS3B1VSN821MR45S
	820	30 × 50	0.15	2.51	EKMS3B1VSN821MR50S
	820	35 × 40	0.15	2.57	EKMS3B1VSN821MA40S
	1,000	35 × 45	0.15	2.91	EKMS3B1VSN102MA45S
	1,200	35 × 50	0.15	3.25	EKMS3B1VSN122MA50S
400	120	22 × 25	0.15	0.77	EKMS401VSN121MP25S
	150	22 × 30	0.15	0.90	EKMS401VSN151MP30S
	180	22 × 35	0.15	1.02	EKMS401VSN181MP35S
	180	25.4 × 25	0.15	0.99	EKMS401VSN181MQ25S
	220	22 × 40	0.15	1.15	EKMS401VSN221MP40S
	220	25.4 × 30	0.15	1.13	EKMS401VSN221MQ30S
	270	22 × 45	0.15	1.29	EKMS401VSN271MP45S
	270	25.4 × 35	0.15	1.30	EKMS401VSN271MQ35S
	270	30 × 25	0.15	1.29	EKMS401VSN271MR25S
	330	22 × 50	0.15	1.47	EKMS401VSN331MP50S
	330	25.4 × 40	0.15	1.47	EKMS401VSN331MQ40S
	330	30 × 30	0.15	1.45	EKMS401VSN331MR30S
	330	35 × 25	0.15	1.52	EKMS401VSN331MA25S
	390	25.4 × 45	0.15	1.63	EKMS401VSN391MQ45S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMS Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
400	390	25.4 × 50	0.15	1.66	EKMS401VSN391MQ50S
	390	30 × 35	0.15	1.61	EKMS401VSN391MR35S
	470	30 × 40	0.15	1.82	EKMS401VSN471MR40S
	470	35 × 30	0.15	1.85	EKMS401VSN471MA30S
	560	30 × 45	0.15	2.04	EKMS401VSN561MR45S
	560	30 × 50	0.15	2.07	EKMS401VSN561MR50S
	560	35 × 35	0.15	2.05	EKMS401VSN561MA35S
	680	35 × 40	0.15	2.34	EKMS401VSN681MA40S
	680	35 × 45	0.15	2.40	EKMS401VSN681MA45S
	820	35 × 50	0.15	2.69	EKMS401VSN821MA50S
420	100	22 × 25	0.20	0.70	EKMS421VSN101MP25S
	120	22 × 30	0.20	0.81	EKMS421VSN121MP30S
	120	25.4 × 25	0.20	0.81	EKMS421VSN121MQ25S
	150	22 × 35	0.20	0.93	EKMS421VSN151MP35S
	180	22 × 40	0.20	1.04	EKMS421VSN181MP40S
	180	25.4 × 30	0.20	1.02	EKMS421VSN181MQ30S
	180	30 × 25	0.20	1.06	EKMS421VSN181MR25S
	220	22 × 45	0.20	1.17	EKMS421VSN221MP45S
	220	22 × 50	0.20	1.20	EKMS421VSN221MP50S
	220	25.4 × 35	0.20	1.18	EKMS421VSN221MQ35S
	220	30 × 30	0.20	1.18	EKMS421VSN221MR30S
	270	25.4 × 40	0.20	1.33	EKMS421VSN271MQ40S
	270	25.4 × 45	0.20	1.36	EKMS421VSN271MQ45S
	270	35 × 25	0.20	1.38	EKMS421VSN271MA25S
	330	25.4 × 50	0.20	1.52	EKMS421VSN331MQ50S
	330	30 × 35	0.20	1.48	EKMS421VSN331MR35S
	330	30 × 40	0.20	1.52	EKMS421VSN331MR40S
	330	35 × 30	0.20	1.55	EKMS421VSN331MA30S
	390	30 × 45	0.20	1.70	EKMS421VSN391MR45S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
420	390	35 × 35	0.20	1.71	EKMS421VSN391MA35S
	470	30 × 50	0.20	1.90	EKMS421VSN471MR50S
	470	35 × 40	0.20	1.95	EKMS421VSN471MA40S
	560	35 × 45	0.20	2.17	EKMS421VSN561MA45S
	680	35 × 50	0.20	2.45	EKMS421VSN681MA50S
450	82	22 × 25	0.20	0.64	EKMS451VSN820MP25S
	120	22 × 30	0.20	0.81	EKMS451VSN121MP30S
	120	22 × 35	0.20	0.83	EKMS451VSN121MP35S
	120	25.4 × 25	0.20	0.81	EKMS451VSN121MQ25S
	150	22 × 40	0.20	0.94	EKMS451VSN151MP40S
	150	25.4 × 30	0.20	0.93	EKMS451VSN151MQ30S
	180	22 × 45	0.20	1.06	EKMS451VSN181MP45S
	180	25.4 × 35	0.20	1.06	EKMS451VSN181MQ35S
	180	30 × 25	0.20	1.06	EKMS451VSN181MR25S
	220	22 × 50	0.20	1.20	EKMS451VSN221MP50S
	220	25.4 × 40	0.20	1.20	EKMS451VSN221MQ40S
	220	30 × 30	0.20	1.18	EKMS451VSN221MR30S
	220	35 × 25	0.20	1.24	EKMS451VSN221MA25S
	270	25.4 × 45	0.20	1.36	EKMS451VSN271MQ45S
	270	25.4 × 50	0.20	1.38	EKMS451VSN271MQ50S
	270	30 × 35	0.20	1.34	EKMS451VSN271MR35S
	270	35 × 30	0.20	1.40	EKMS451VSN271MA30S
	330	30 × 40	0.20	1.52	EKMS451VSN331MR40S
	390	30 × 45	0.20	1.70	EKMS451VSN391MR45S
	390	30 × 50	0.20	1.73	EKMS451VSN391MR50S
	390	35 × 35	0.20	1.71	EKMS451VSN391MA35S
	470	35 × 40	0.20	1.95	EKMS451VSN471MA40S
	470	35 × 45	0.20	1.99	EKMS451VSN471MA45S
	560	35 × 50	0.20	2.22	EKMS451VSN561MA50S

◆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
315 to 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

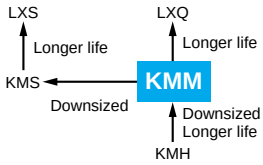
NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMM Series

- ●Downsized, longer life, and high ripple version of KMH series
- ●Endurance with ripple current : 2,000 to 3,000 hours at 105℃
- ●Non solvent resistant type
- ●**RoHS Compliant**

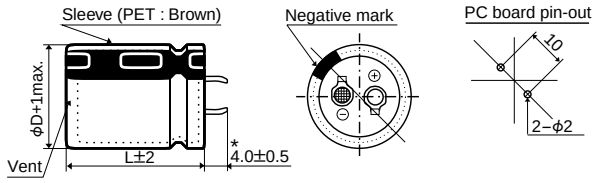


◆SPECIFICATIONS

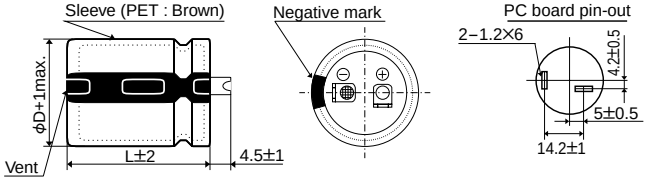
Items	Characteristics			
Category Temperature Range	−25 to +105℃			
Rated Voltage Range	160 to 450Vdc			
Capacitance Tolerance	±20% (M)			(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)			(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 400V	420 & 450V	
	tanδ (Max.)	0.15	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 400V	420 & 450V	
	Z(−25℃)/Z(+20℃)	4	8	(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 3,000 hours (2,000 hours for φ20×20L products) at 105℃.			
	Capacitance change	≦±20% of the initial value		
	D.F. (tanδ)	≦200% of the initial specified value		
	Leakage current	≦The initial specified value		
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.			
	Capacitance change	≦±15% of the initial value		
	D.F. (tanδ)	≦150% of the initial specified value		
	Leakage current	≦The initial specified value		

◆DIMENSIONS [mm]

●Terminal Code : VS (φ20 to φ35) : Standard



●Terminal Code : LI (φ35)



*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

◆PART NUMBERING SYSTEM

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

- Supplement code
- Size code
- Capacitance tolerance code
- Capacitance code (ex. 120μF:121, 1,000μF:102)
- Dummy terminal code
- Terminal code (VS, LI)
- Voltage code (ex. 160V:161, 250V:251, 315V:3B1)
- Series code
- Category

Please refer to "Product code guide (snap-in type)"

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/105℃,120Hz)	Part No.
160	180	20×20	0.15	0.68	EKMM161VSN181MN20S
	220	20×25	0.15	0.85	EKMM161VSN221MN25S
	220	22×20	0.15	0.81	EKMM161VSN221MP20S
	270	20×25	0.15	1.10	EKMM161VSN271MN25S
	270	25.4×20	0.15	0.98	EKMM161VSN271MQ20S
	330	20×30	0.15	1.20	EKMM161VSN331MN30S
	330	22×25	0.15	1.20	EKMM161VSN331MP25S
	330	25.4×20	0.15	1.02	EKMM161VSN331MQ20S
	390	20×30	0.15	1.30	EKMM161VSN391MN30S
	390	22×25	0.15	1.30	EKMM161VSN391MP25S
	390	25.4×25	0.15	1.26	EKMM161VSN391MQ25S
	390	30×20	0.15	1.25	EKMM161VSN391MR20S
	470	20×35	0.15	1.34	EKMM161VSN471MN35S
	470	22×30	0.15	1.55	EKMM161VSN471MP30S
	470	25.4×25	0.15	1.55	EKMM161VSN471MQ25S
	470	30×20	0.15	1.30	EKMM161VSN471MR20S
	560	20×40	0.15	1.50	EKMM161VSN561MN40S
	560	22×35	0.15	1.67	EKMM161VSN561MP35S
	560	25.4×30	0.15	1.67	EKMM161VSN561MQ30S
	560	30×25	0.15	1.67	EKMM161VSN561MR25S
	560	35×20	0.15	1.46	EKMM161VSN561MA20S
	680	20×45	0.15	1.70	EKMM161VSN681MN45S
	680	22×40	0.15	1.82	EKMM161VSN681MP40S
	680	25.4×30	0.15	1.82	EKMM161VSN681MQ30S
	680	30×25	0.15	1.82	EKMM161VSN681MR25S
	680	35×20	0.15	1.51	EKMM161VSN681MA20S
	820	22×45	0.15	2.04	EKMM161VSN821MP45S
	820	25.4×35	0.15	2.04	EKMM161VSN821MQ35S
	820	30×30	0.15	2.04	EKMM161VSN821MR30S
	820	35×25	0.15	2.04	EKMM161VSN821MA25S
	1,000	22×50	0.15	2.25	EKMM161VSN102MP50S
	1,000	25.4×40	0.15	2.25	EKMM161VSN102MQ40S
	1,000	30×30	0.15	2.25	EKMM161VSN102MR30S
	1,000	35×25	0.15	2.25	EKMM161VSN102MA25S
	1,200	25.4×45	0.15	2.49	EKMM161VSN122MQ45S
	1,200	30×35	0.15	2.49	EKMM161VSN122MR35S
	1,200	35×30	0.15	2.49	EKMM161VSN122MA30S
	1,500	25.4×60	0.15	2.97	EKMM161VSN152MQ60S
	1,500	30×40	0.15	2.84	EKMM161VSN152MR40S
	1,500	35×30	0.15	2.84	EKMM161VSN152MA30S
	1,800	30×45	0.15	3.32	EKMM161VSN182MR45S
	1,800	35×35	0.15	3.00	EKMM161VSN182MA35S
	2,200	30×60	0.15	3.86	EKMM161VSN222MR60S
	2,200	35×45	0.15	3.50	EKMM161VSN222MA45S
	2,700	35×50	0.15	4.00	EKMM161VSN272MA50S
	3,300	35×60	0.15	4.63	EKMM161VSN332MA60S
180	150	20×20	0.15	0.62	EKMM181VSN151MN20S
	180	20×25	0.15	0.77	EKMM181VSN181MN25S
	180	22×20	0.15	0.80	EKMM181VSN181MP20S
	220	20×25	0.15	1.00	EKMM181VSN221MN25S
	220	25.4×20	0.15	0.90	EKMM181VSN221MQ20S
	270	20×30	0.15	1.10	EKMM181VSN271MN30S
	270	22×25	0.15	1.00	EKMM181VSN271MP25S
	270	25.4×20	0.15	0.95	EKMM181VSN271MQ20S
	330	20×30	0.15	1.20	EKMM181VSN331MN30S
	330	22×25	0.15	1.20	EKMM181VSN331MP25S
	330	25.4×25	0.15	1.16	EKMM181VSN331MQ25S
	330	30×20	0.15	1.15	EKMM181VSN331MR20S
	390	20×35	0.15	1.30	EKMM181VSN391MN35S
	390	22×30	0.15	1.35	EKMM181VSN391MP30S
	390	25.4×25	0.15	1.35	EKMM181VSN391MQ25S
	390	30×20	0.15	1.20	EKMM181VSN391MR20S
	470	20×40	0.15	1.40	EKMM181VSN471MN40S
	470	22×35	0.15	1.50	EKMM181VSN471MP35S
	470	25.4×30	0.15	1.50	EKMM181VSN471MQ30S
	470	30×25	0.15	1.50	EKMM181VSN471MR25S
	470	35×20	0.15	1.36	EKMM181VSN471MA20S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/105℃,120Hz)	Part No.
180	560	20×45	0.15	1.55	EKMM181VSN561MN45S
	560	22×40	0.15	1.67	EKMM181VSN561MP40S
	560	25.4×30	0.15	1.67	EKMM181VSN561MQ30S
	560	30×25	0.15	1.67	EKMM181VSN561MR25S
	560	35×20	0.15	1.43	EKMM181VSN561MA20S
	680	20×50	0.15	1.75	EKMM181VSN681MN50S
	680	22×45	0.15	1.78	EKMM181VSN681MP45S
	680	25.4×35	0.15	1.78	EKMM181VSN681MQ35S
	680	30×30	0.15	1.78	EKMM181VSN681MR30S
	680	35×25	0.15	1.83	EKMM181VSN681MA25S
	820	22×50	0.15	2.04	EKMM181VSN821MP50S
	820	25.4×40	0.15	2.04	EKMM181VSN821MQ40S
	820	30×30	0.15	2.04	EKMM181VSN821MR30S
	820	35×25	0.15	2.04	EKMM181VSN821MA25S
	1,000	25.4×45	0.15	2.30	EKMM181VSN102MQ45S
	1,000	30×35	0.15	2.30	EKMM181VSN102MR35S
	1,000	35×30	0.15	2.30	EKMM181VSN102MA30S
	1,200	25.4×50	0.15	2.55	EKMM181VSN122MQ50S
	1,200	30×40	0.15	2.55	EKMM181VSN122MR40S
	1,200	35×30	0.15	2.55	EKMM181VSN122MA30S
	1,500	30×45	0.15	2.90	EKMM181VSN152MR45S
	1,500	35×35	0.15	2.90	EKMM181VSN152MA35S
	1,800	30×60	0.15	3.49	EKMM181VSN182MR60S
	1,800	35×40	0.15	3.30	EKMM181VSN182MA40S
	2,200	35×50	0.15	3.65	EKMM181VSN222MA50S
	2,700	35×60	0.15	4.19	EKMM181VSN272MA60S
200	120	20×20	0.15	0.56	EKMM201VSN121MN20S
	150	20×25	0.15	0.71	EKMM201VSN151MN25S
	150	22×20	0.15	0.73	EKMM201VSN151MP20S
	180	20×25	0.15	0.77	EKMM201VSN181MN25S
	180	22×20	0.15	0.80	EKMM201VSN181MP20S
	220	20×25	0.15	1.00	EKMM201VSN221MN25S
	220	25.4×20	0.15	0.85	EKMM201VSN221MQ20S
	270	20×30	0.15	1.10	EKMM201VSN271MN30S
	270	22×25	0.15	1.10	EKMM201VSN271MP25S
	270	30×20	0.15	1.05	EKMM201VSN271MR20S
	330	20×35	0.15	1.20	EKMM201VSN331MN35S
	330	22×30	0.15	1.25	EKMM201VSN331MP30S
	330	25.4×25	0.15	1.25	EKMM201VSN331MQ25S
	330	30×20	0.15	1.10	EKMM201VSN331MR20S
	390	20×40	0.15	1.31	EKMM201VSN391MN40S
	390	22×30	0.15	1.35	EKMM201VSN391MP30S
	390	25.4×25	0.15	1.35	EKMM201VSN391MQ25S
	390	35×20	0.15	1.30	EKMM201VSN391MA20S
	470	20×45	0.15	1.45	EKMM201VSN471MN45S
	470	22×35	0.15	1.50	EKMM201VSN471MP35S
	470	25.4×30	0.15	1.50	EKMM201VSN471MQ30S
	470	30×25	0.15	1.50	EKMM201VSN471MR25S
	470	35×20	0.15	1.41	EKMM201VSN471MA20S
	560	20×50	0.15	1.58	EKMM201VSN561MN50S
	560	22×40	0.15	1.67	EKMM201VSN561MP40S
	560	25.4×30	0.15	1.67	EKMM201VSN561MQ30S
	560	30×25	0.15	1.67	EKMM201VSN561MR25S
	680	22×45	0.15	1.78	EKMM201VSN681MP45S
	680	25.4×35	0.15	1.78	EKMM201VSN681MQ35S
	680	30×30	0.15	1.78	EKMM201VSN681MR30S
	680	35×25	0.15	1.78	EKMM201VSN681MA25S
	820	25.4×45	0.15	2.04	EKMM201VSN821MQ45S
	820	30×30	0.15	2.04	EKMM201VSN821MR30S
	820	35×25	0.15	2.04	EKMM201VSN821MA25S
	1,000	25.4×50	0.15	2.30	EKMM201VSN102MQ50S
	1,000	30×35	0.15	2.30	EKMM201VSN102MR35S
	1,000	35×30	0.15	2.30	EKMM201VSN102MA30S
	1,200	25.4×60	0.15	2.66	EKMM201VSN122MQ60S
	1,200	30×40	0.15	2.65	EKMM201VSN122MR40S
	1,200	35×35	0.15	2.65	EKMM201VSN122MA35S
	1,500	30×50	0.15	3.08	EKMM201VSN152MR50S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
200	1,500	35×40	0.15	3.08	EKMM201VSN152MA40S
	1,800	30×60	0.15	3.49	EKMM201VSN182MR60S
	1,800	35×45	0.15	3.48	EKMM201VSN182MA45S
	2,200	35×50	0.15	3.78	EKMM201VSN222MA50S
220	120	20×20	0.15	0.56	EKMM221VSN121MN20S
	150	20×25	0.15	0.73	EKMM221VSN151MN25S
	150	22×20	0.15	0.67	EKMM221VSN151MP20S
	180	20×25	0.15	0.90	EKMM221VSN181MN25S
	180	25.4×20	0.15	0.76	EKMM221VSN181MQ20S
	220	20×30	0.15	1.00	EKMM221VSN221MN30S
	220	22×25	0.15	1.00	EKMM221VSN221MP25S
	220	25.4×20	0.15	0.84	EKMM221VSN221MQ20S
	270	20×35	0.15	1.15	EKMM221VSN271MN35S
	270	22×30	0.15	1.15	EKMM221VSN271MP30S
	270	25.4×25	0.15	1.08	EKMM221VSN271MQ25S
	270	30×20	0.15	0.98	EKMM221VSN271MR20S
	330	20×40	0.15	1.25	EKMM221VSN331MN40S
	330	22×35	0.15	1.25	EKMM221VSN331MP35S
	330	25.4×25	0.15	1.25	EKMM221VSN331MQ25S
	330	35×20	0.15	1.13	EKMM221VSN331MA20S
	390	20×45	0.15	1.40	EKMM221VSN391MN45S
	390	22×35	0.15	1.40	EKMM221VSN391MP35S
	390	25.4×30	0.15	1.40	EKMM221VSN391MQ30S
	390	30×25	0.15	1.36	EKMM221VSN391MR25S
	390	35×20	0.15	1.23	EKMM221VSN391MA20S
	470	20×50	0.15	1.51	EKMM221VSN471MN50S
	470	22×40	0.15	1.51	EKMM221VSN471MP40S
	470	25.4×35	0.15	1.54	EKMM221VSN471MQ35S
	470	30×25	0.15	1.50	EKMM221VSN471MR25S
	560	22×45	0.15	1.70	EKMM221VSN561MP45S
	560	25.4×40	0.15	1.72	EKMM221VSN561MQ40S
	560	30×30	0.15	1.70	EKMM221VSN561MR30S
	560	35×25	0.15	1.71	EKMM221VSN561MA25S
	680	25.4×45	0.15	1.94	EKMM221VSN681MQ45S
	680	30×35	0.15	1.93	EKMM221VSN681MR35S
	680	35×25	0.15	1.89	EKMM221VSN681MA25S
	820	25.4×50	0.15	2.18	EKMM221VSN821MQ50S
	820	30×40	0.15	2.19	EKMM221VSN821MR40S
	820	35×30	0.15	2.16	EKMM221VSN821MA30S
	1,000	25.4×60	0.15	2.54	EKMM221VSN102MQ60S
	1,000	30×45	0.15	2.50	EKMM221VSN102MR45S
	1,000	35×35	0.15	2.44	EKMM221VSN102MA35S
	1,200	30×50	0.15	2.81	EKMM221VSN122MR50S
	1,200	35×40	0.15	2.79	EKMM221VSN122MA40S
	1,500	30×60	0.15	3.30	EKMM221VSN152MR60S
	1,500	35×45	0.15	3.22	EKMM221VSN152MA45S
	1,800	35×50	0.15	3.63	EKMM221VSN182MA50S
	2,200	35×60	0.15	4.23	EKMM221VSN222MA60S
250	100	20×20	0.15	0.51	EKMM251VSN101MN20S
	120	20×25	0.15	0.58	EKMM251VSN121MN25S
	120	22×20	0.15	0.60	EKMM251VSN121MP20S
	150	20×25	0.15	0.79	EKMM251VSN151MN25S
	150	25.4×20	0.15	0.74	EKMM251VSN151MQ20S
	180	20×30	0.15	0.90	EKMM251VSN181MN30S
	180	22×25	0.15	0.78	EKMM251VSN181MP25S
	180	25.4×20	0.15	0.75	EKMM251VSN181MQ20S
	220	20×30	0.15	1.00	EKMM251VSN221MN30S
	220	22×25	0.15	1.00	EKMM251VSN221MP25S
	220	25.4×25	0.15	0.95	EKMM251VSN221MQ25S
	220	30×20	0.15	0.95	EKMM251VSN221MR20S
	270	20×35	0.15	1.10	EKMM251VSN271MN35S
	270	22×30	0.15	1.18	EKMM251VSN271MP30S
	270	25.4×25	0.15	1.18	EKMM251VSN271MQ25S
	270	30×20	0.15	1.00	EKMM251VSN271MR20S
	330	20×40	0.15	1.20	EKMM251VSN331MN40S
	330	22×35	0.15	1.30	EKMM251VSN331MP35S
	330	25.4×30	0.15	1.30	EKMM251VSN331MQ30S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
250	330	30×25	0.15	1.30	EKMM251VSN331MR25S
	330	35×20	0.15	1.16	EKMM251VSN331MA20S
	390	20×50	0.15	1.45	EKMM251VSN391MN50S
	390	22×40	0.15	1.49	EKMM251VSN391MP40S
	390	25.4×35	0.15	1.49	EKMM251VSN391MQ35S
	390	30×25	0.15	1.49	EKMM251VSN391MR25S
	470	22×45	0.15	1.65	EKMM251VSN471MP45S
	470	25.4×35	0.15	1.65	EKMM251VSN471MQ35S
	470	30×30	0.15	1.65	EKMM251VSN471MR30S
	470	35×25	0.15	1.65	EKMM251VSN471MA25S
	560	22×50	0.15	1.67	EKMM251VSN561MP50S
	560	25.4×40	0.15	1.80	EKMM251VSN561MQ40S
	560	30×30	0.15	1.80	EKMM251VSN561MR30S
	560	35×25	0.15	1.80	EKMM251VSN561MA25S
	680	25.4×50	0.15	2.00	EKMM251VSN681MQ50S
	680	30×35	0.15	2.00	EKMM251VSN681MR35S
	680	35×30	0.15	2.00	EKMM251VSN681MA30S
	820	25.4×60	0.15	2.20	EKMM251VSN821MQ60S
	820	30×40	0.15	2.30	EKMM251VSN821MR40S
	820	35×35	0.15	2.30	EKMM251VSN821MA35S
	1,000	30×50	0.15	2.47	EKMM251VSN102MR50S
	1,000	35×40	0.15	2.47	EKMM251VSN102MA40S
	1,200	30×60	0.15	2.85	EKMM251VSN122MR60S
	1,200	35×45	0.15	2.60	EKMM251VSN122MA45S
	1,500	35×50	0.15	3.00	EKMM251VSN152MA50S
	1,800	35×60	0.15	3.42	EKMM251VSN182MA60S
315	56	20×20	0.15	0.38	EKMM3B1VSN560MN20S
	68	20×25	0.15	0.47	EKMM3B1VSN680MN25S
	68	22×20	0.15	0.45	EKMM3B1VSN680MP20S
	82	20×25	0.15	0.64	EKMM3B1VSN820MN25S
	82	22×20	0.15	0.47	EKMM3B1VSN820MP20S
	100	20×30	0.15	0.69	EKMM3B1VSN101MN30S
	100	22×25	0.15	0.61	EKMM3B1VSN101MP25S
	100	25.4×20	0.15	0.56	EKMM3B1VSN101MQ20S
	120	20×30	0.15	0.75	EKMM3B1VSN121MN30S
	120	22×25	0.15	0.75	EKMM3B1VSN121MP25S
	120	25.4×20	0.15	0.62	EKMM3B1VSN121MQ20S
	120	30×20	0.15	0.65	EKMM3B1VSN121MR20S
	150	20×35	0.15	0.82	EKMM3B1VSN151MN35S
	150	22×30	0.15	0.82	EKMM3B1VSN151MP30S
	150	25.4×25	0.15	0.82	EKMM3B1VSN151MQ25S
	150	30×20	0.15	0.70	EKMM3B1VSN151MR20S
	150	35×20	0.15	0.76	EKMM3B1VSN151MA20S
	180	20×40	0.15	0.90	EKMM3B1VSN181MN40S
	180	22×35	0.15	0.92	EKMM3B1VSN181MP35S
	180	25.4×25	0.15	0.92	EKMM3B1VSN181MQ25S
	180	30×25	0.15	0.90	EKMM3B1VSN181MR25S
	180	35×20	0.15	0.85	EKMM3B1VSN181MA20S
	220	20×50	0.15	1.00	EKMM3B1VSN221MN50S
	220	22×40	0.15	1.04	EKMM3B1VSN221MP40S
	220	25.4×30	0.15	1.04	EKMM3B1VSN221MQ30S
	220	30×25	0.15	1.04	EKMM3B1VSN221MR25S
	220	35×20	0.15	0.90	EKMM3B1VSN221MA20S
	270	22×45	0.15	1.16	EKMM3B1VSN271MP45S
	270	25.4×35	0.15	1.16	EKMM3B1VSN271MQ35S
	270	30×25	0.15	1.16	EKMM3B1VSN271MR25S
	270	35×25	0.15	1.15	EKMM3B1VSN271MA25S
	330	22×50	0.15	1.33	EKMM3B1VSN331MP50S
	330	25.4×40	0.15	1.33	EKMM3B1VSN331MQ40S
	330	30×30	0.15	1.33	EKMM3B1VSN331MR30S
	330	35×25	0.15	1.33	EKMM3B1VSN331MA25S
	390	25.4×45	0.15	1.47	EKMM3B1VSN391MQ45S
	390	30×35	0.15	1.47	EKMM3B1VSN391MR35S
	390	35×30	0.15	1.47	EKMM3B1VSN391MA30S
	470	25.4×50	0.15	1.70	EKMM3B1VSN471MQ50S
	470	30×40	0.15	1.70	EKMM3B1VSN471MR40S
	470	35×30	0.15	1.70	EKMM3B1VSN471MA30S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
315	560	30×45	0.15	2.05	EKMM3B1VSN561MR45S
	560	35×35	0.15	2.05	EKMM3B1VSN561MA35S
	680	30×50	0.15	2.17	EKMM3B1VSN681MR50S
	680	35×40	0.15	2.17	EKMM3B1VSN681MA40S
	820	35×45	0.15	2.20	EKMM3B1VSN821MA45S
	1,000	35×60	0.15	2.55	EKMM3B1VSN102MA60S
350	47	20×20	0.15	0.35	EKMM351VSN470MN20S
	56	20×25	0.15	0.43	EKMM351VSN560MN25S
	56	22×20	0.15	0.41	EKMM351VSN560MP20S
	68	20×25	0.15	0.47	EKMM351VSN680MN25S
	68	25.4×20	0.15	0.46	EKMM351VSN680MQ20S
	82	20×30	0.15	0.54	EKMM351VSN820MN30S
	82	22×25	0.15	0.55	EKMM351VSN820MP25S
	82	25.4×20	0.15	0.51	EKMM351VSN820MQ20S
	100	20×30	0.15	0.60	EKMM351VSN101MN30S
	100	22×25	0.15	0.69	EKMM351VSN101MP25S
	100	30×20	0.15	0.60	EKMM351VSN101MR20S
	120	20×35	0.15	0.68	EKMM351VSN121MN35S
	120	22×30	0.15	0.75	EKMM351VSN121MP30S
	120	25.4×25	0.15	0.75	EKMM351VSN121MQ25S
	120	30×20	0.15	0.65	EKMM351VSN121MR20S
	150	20×40	0.15	0.78	EKMM351VSN151MN40S
	150	22×35	0.15	0.82	EKMM351VSN151MP35S
	150	25.4×30	0.15	0.83	EKMM351VSN151MQ30S
	150	30×25	0.15	0.82	EKMM351VSN151MR25S
	150	35×20	0.15	0.76	EKMM351VSN151MA20S
	180	20×45	0.15	0.87	EKMM351VSN181MN45S
	180	22×40	0.15	0.92	EKMM351VSN181MP40S
	180	25.4×30	0.15	0.92	EKMM351VSN181MQ30S
	180	30×25	0.15	0.90	EKMM351VSN181MR25S
	220	20×50	0.15	1.00	EKMM351VSN221MN50S
	220	22×45	0.15	1.05	EKMM351VSN221MP45S
	220	25.4×35	0.15	1.04	EKMM351VSN221MQ35S
	220	30×30	0.15	1.02	EKMM351VSN221MR30S
	220	35×25	0.15	1.04	EKMM351VSN221MA25S
	270	22×50	0.15	1.16	EKMM351VSN271MP50S
	270	25.4×40	0.15	1.18	EKMM351VSN271MQ40S
	270	30×30	0.15	1.17	EKMM351VSN271MR30S
	270	35×25	0.15	1.20	EKMM351VSN271MA25S
	330	25.4×45	0.15	1.29	EKMM351VSN331MQ45S
	330	30×35	0.15	1.34	EKMM351VSN331MR35S
	330	35×30	0.15	1.22	EKMM351VSN331MA30S
	390	25.4×50	0.15	1.51	EKMM351VSN391MQ50S
	390	30×40	0.15	1.51	EKMM351VSN391MR40S
	390	35×35	0.15	1.47	EKMM351VSN391MA35S
	470	25.4×60	0.15	1.66	EKMM351VSN471MQ60S
	470	30×45	0.15	1.65	EKMM351VSN471MR45S
	470	35×35	0.15	1.69	EKMM351VSN471MA35S
	560	30×50	0.15	1.85	EKMM351VSN561MR50S
	560	35×40	0.15	1.90	EKMM351VSN561MA40S
	680	30×60	0.15	2.15	EKMM351VSN681MR60S
	680	35×50	0.15	1.99	EKMM351VSN681MA50S
	820	35×60	0.15	2.31	EKMM351VSN821MA60S
400	39	20×20	0.15	0.32	EKMM401VSN390MN20S
	47	20×25	0.15	0.39	EKMM401VSN470MN25S
	47	22×20	0.15	0.37	EKMM401VSN470MP20S
	56	20×25	0.15	0.51	EKMM401VSN560MN25S
	56	25.4×20	0.15	0.42	EKMM401VSN560MQ20S
	68	20×30	0.15	0.56	EKMM401VSN680MN30S
	68	22×25	0.15	0.50	EKMM401VSN680MP25S
	68	25.4×20	0.15	0.46	EKMM401VSN680MQ20S
	82	20×30	0.15	0.64	EKMM401VSN820MN30S
	82	22×25	0.15	0.64	EKMM401VSN820MP25S
	82	30×20	0.15	0.55	EKMM401VSN820MR20S
	100	20×35	0.15	0.70	EKMM401VSN101MN35S
	100	22×30	0.15	0.70	EKMM401VSN101MP30S
	100	25.4×25	0.15	0.70	EKMM401VSN101MQ25S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
400	100	30×20	0.15	0.60	EKMM401VSN101MR20S
	120	20×40	0.15	0.75	EKMM401VSN121MN40S
	120	22×35	0.15	0.75	EKMM401VSN121MP35S
	120	25.4×25	0.15	0.75	EKMM401VSN121MQ25S
	120	30×25	0.15	0.73	EKMM401VSN121MR25S
	120	35×20	0.15	0.75	EKMM401VSN121MA20S
	150	20×45	0.15	0.83	EKMM401VSN151MN45S
	150	22×40	0.15	0.88	EKMM401VSN151MP40S
	150	25.4×30	0.15	0.88	EKMM401VSN151MQ30S
	150	30×25	0.15	0.88	EKMM401VSN151MR25S
	150	35×20	0.15	0.80	EKMM401VSN151MA20S
	180	22×45	0.15	0.98	EKMM401VSN181MP45S
	180	25.4×35	0.15	0.98	EKMM401VSN181MQ35S
	180	30×30	0.15	0.98	EKMM401VSN181MR30S
	180	35×25	0.15	0.98	EKMM401VSN181MA25S
	220	22×50	0.15	1.10	EKMM401VSN221MP50S
	220	25.4×40	0.15	1.10	EKMM401VSN221MQ40S
	220	30×30	0.15	1.10	EKMM401VSN221MR30S
	220	35×25	0.15	1.10	EKMM401VSN221MA25S
	270	25.4×45	0.15	1.22	EKMM401VSN271MQ45S
	270	30×35	0.15	1.22	EKMM401VSN271MR35S
	270	35×30	0.15	1.22	EKMM401VSN271MA30S
	330	25.4×50	0.15	1.44	EKMM401VSN331MQ50S
	330	30×40	0.15	1.44	EKMM401VSN331MR40S
	330	35×30	0.15	1.44	EKMM401VSN331MA30S
	390	25.4×60	0.15	1.51	EKMM401VSN391MQ60S
	390	30×45	0.15	1.60	EKMM401VSN391MR45S
	390	35×35	0.15	1.60	EKMM401VSN391MA35S
	470	30×50	0.15	1.90	EKMM401VSN471MR50S
	470	35×40	0.15	1.90	EKMM401VSN471MA40S
	560	30×60	0.15	2.10	EKMM401VSN561MR60S
	560	35×45	0.15	2.12	EKMM401VSN561MA45S
	680	35×60	0.15	2.27	EKMM401VSN681MA60S
420	39	20×20	0.20	0.32	EKMM421VSN390MN20S
	47	20×25	0.20	0.39	EKMM421VSN470MN25S
	47	22×20	0.20	0.37	EKMM421VSN470MP20S
	56	20×25	0.20	0.51	EKMM421VSN560MN25S
	56	25.4×20	0.20	0.42	EKMM421VSN560MQ20S
	68	20×30	0.20	0.56	EKMM421VSN680MN30S
	68	22×25	0.20	0.50	EKMM421VSN680MP25S
	68	25.4×20	0.20	0.46	EKMM421VSN680MQ20S
	82	20×35	0.20	0.64	EKMM421VSN820MN35S
	82	22×25	0.20	0.64	EKMM421VSN820MP25S
	82	25.4×25	0.20	0.58	EKMM421VSN820MQ25S
	82	30×20	0.20	0.53	EKMM421VSN820MR20S
	100	20×35	0.20	0.70	EKMM421VSN101MN35S
	100	22×30	0.20	0.70	EKMM421VSN101MP30S
	100	25.4×25	0.20	0.70	EKMM421VSN101MQ25S
	100	30×20	0.20	0.59	EKMM421VSN101MR20S
	120	20×40	0.20	0.75	EKMM421VSN121MN40S
	120	22×35	0.20	0.75	EKMM421VSN121MP35S
	120	25.4×30	0.20	0.75	EKMM421VSN121MQ30S
	120	30×25	0.20	0.73	EKMM421VSN121MR25S
	120	35×20	0.20	0.67	EKMM421VSN121MA20S
	150	20×50	0.20	0.88	EKMM421VSN151MN50S
	150	22×40	0.20	0.88	EKMM421VSN151MP40S
	150	25.4×35	0.20	0.88	EKMM421VSN151MQ35S
	150	30×25	0.20	0.88	EKMM421VSN151MR25S
	180	22×45	0.20	0.95	EKMM421VSN181MP45S
	180	25.4×35	0.20	0.95	EKMM421VSN181MQ35S
	180	30×30	0.20	0.95	EKMM421VSN181MR30S
	180	35×25	0.20	0.94	EKMM421VSN181MA25S
	220	22×50	0.20	1.10	EKMM421VSN221MP50S
	220	25.4×45	0.20	1.10	EKMM421VSN221MQ45S
	220	30×35	0.20	1.10	EKMM421VSN221MR35S
	220	35×25	0.20	1.10	EKMM421VSN221MA25S
	270	25.4×50	0.20	1.22	EKMM421VSN271MQ50S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105℃

KMM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
420	270	30×40	0.20	1.22	EKMM421VSN271MR40S
	270	35×30	0.20	1.22	EKMM421VSN271MA30S
	330	25.4×60	0.20	1.41	EKMM421VSN331MQ60S
	330	30×45	0.20	1.45	EKMM421VSN331MR45S
	330	35×35	0.20	1.45	EKMM421VSN331MA35S
	390	30×50	0.20	1.55	EKMM421VSN391MR50S
	390	35×40	0.20	1.55	EKMM421VSN391MA40S
	470	30×60	0.20	1.79	EKMM421VSN471MR60S
	470	35×45	0.20	1.90	EKMM421VSN471MA45S
	560	35×50	0.20	2.15	EKMM421VSN561MA50S
	680	35×60	0.20	2.27	EKMM421VSN681MA60S
450	39	20×25	0.20	0.34	EKMM451VSN390MN25S
	47	20×25	0.20	0.39	EKMM451VSN470MN25S
	56	20×30	0.20	0.51	EKMM451VSN560MN30S
	56	22×25	0.20	0.40	EKMM451VSN560MP25S
	68	20×35	0.20	0.56	EKMM451VSN680MN35S
	68	22×30	0.20	0.53	EKMM451VSN680MP30S
	68	25.4×25	0.20	0.50	EKMM451VSN680MQ25S
	82	20×35	0.20	0.64	EKMM451VSN820MN35S
	82	22×30	0.20	0.64	EKMM451VSN820MP30S
	82	25.4×25	0.20	0.64	EKMM451VSN820MQ25S
	100	20×45	0.20	0.69	EKMM451VSN101MN45S
	100	22×35	0.20	0.69	EKMM451VSN101MP35S
	100	25.4×30	0.20	0.69	EKMM451VSN101MQ30S
	100	30×25	0.20	0.64	EKMM451VSN101MR25S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
450	120	20×50	0.20	0.75	EKMM451VSN121MN50S
	120	22×40	0.20	0.80	EKMM451VSN121MP40S
	120	25.4×30	0.20	0.80	EKMM451VSN121MQ30S
	120	30×25	0.20	0.80	EKMM451VSN121MR25S
	120	35×25	0.20	0.73	EKMM451VSN121MA25S
	150	22×45	0.20	0.88	EKMM451VSN151MP45S
	150	25.4×35	0.20	0.88	EKMM451VSN151MQ35S
	150	30×30	0.20	0.88	EKMM451VSN151MR30S
	150	35×25	0.20	0.75	EKMM451VSN151MA25S
	180	22×50	0.20	1.00	EKMM451VSN181MP50S
	180	25.4×40	0.20	1.00	EKMM451VSN181MQ40S
	180	30×30	0.20	1.00	EKMM451VSN181MR30S
	220	25.4×45	0.20	1.12	EKMM451VSN221MQ45S
	220	30×35	0.20	1.12	EKMM451VSN221MR35S
	220	35×30	0.20	1.12	EKMM451VSN221MA30S
	270	25.4×60	0.20	1.18	EKMM451VSN271MQ60S
	270	30×40	0.20	1.28	EKMM451VSN271MR40S
	270	35×35	0.20	1.28	EKMM451VSN271MA35S
	330	30×50	0.20	1.45	EKMM451VSN331MR50S
	330	35×40	0.20	1.45	EKMM451VSN331MA40S
	390	30×60	0.20	1.51	EKMM451VSN391MR60S
	390	35×40	0.20	1.55	EKMM451VSN391MA40S
	470	35×50	0.20	1.85	EKMM451VSN471MA50S
	560	35×60	0.20	1.91	EKMM451VSN561MA60S

◆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
315 to 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

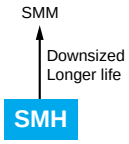
NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard snap-ins, 85℃

SMH Series

- Endurance with ripple current : 2,000 hours at 85℃
- Non solvent resistant type
- **RoHS Compliant**

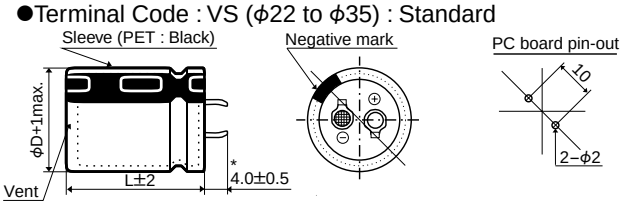


◆SPACIFICATIONS

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=0.02CV or 3mA, 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)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	80V	100V	
	tanδ (Max.)	0.60	0.50	0.40	0.30	0.25	0.20	0.15	0.15	0.15	(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	4	4	3	3	2	2	2	2	
	Z(−40℃)/Z(+20℃)	15	15	15	10	8	6	6	5	5	(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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.										
	Capacitance change	≦±20% of the initial value									
	D.F. (tanδ)	≦150% of the initial specified value									
	Leakage current	≦The initial specified value									

◆DIMENSIONS [mm]

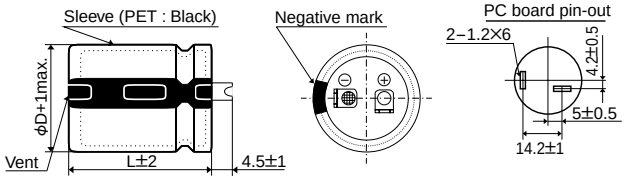
●Terminal Code : VS (φ22 to φ35) : Standard



*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

●Terminal Code : LI (φ35)



◆PART NUMBERING SYSTEM

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

Supplement code
Size code
Capacitance tolerance code
Capacitance code (ex. 820μF:821, 3,300μF:332)
Dummy terminal code
Terminal code
Voltage code (ex. 6.3V:6R3, 63V:630, 100V:101)
Series code
Category

Please refer to "Product code guide (snap-in type)"

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard snap-ins, 85℃

SMH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
6.3	15,000	22×25	0.60	2.44	ESMH6R3VSN153MP25S
	18,000	22×30	0.60	2.67	ESMH6R3VSN183MP30S
	18,000	25.4×25	0.60	2.70	ESMH6R3VSN183MQ25S
	22,000	22×30	0.60	3.06	ESMH6R3VSN223MP30S
	22,000	25.4×25	0.60	3.07	ESMH6R3VSN223MQ25S
	27,000	22×35	0.60	3.49	ESMH6R3VSN273MP35S
	27,000	25.4×30	0.60	3.52	ESMH6R3VSN273MQ30S
	27,000	30×25	0.60	3.57	ESMH6R3VSN273MR25S
	33,000	22×40	0.60	3.97	ESMH6R3VSN333MP40S
	33,000	25.4×35	0.60	4.02	ESMH6R3VSN333MQ35S
	33,000	30×25	0.60	3.95	ESMH6R3VSN333MR25S
	39,000	22×50	0.60	4.55	ESMH6R3VSN393MP50S
	39,000	25.4×40	0.60	4.50	ESMH6R3VSN393MQ40S
	39,000	30×30	0.60	4.45	ESMH6R3VSN393MR30S
	39,000	35×25	0.60	4.51	ESMH6R3VSN393MA25S
	47,000	25.4×45	0.60	5.09	ESMH6R3VSN473MQ45S
	47,000	30×35	0.60	5.06	ESMH6R3VSN473MR35S
	47,000	35×30	0.60	5.01	ESMH6R3VSN473MA30S
	56,000	25.4×50	0.60	5.71	ESMH6R3VSN563MQ50S
	56,000	30×40	0.60	5.70	ESMH6R3VSN563MR40S
	56,000	35×30	0.60	5.77	ESMH6R3VSN563MA30S
	68,000	30×45	0.60	6.48	ESMH6R3VSN683MR45S
	68,000	35×35	0.60	6.42	ESMH6R3VSN683MA35S
	82,000	30×50	0.60	7.32	ESMH6R3VSN823MR50S
	82,000	35×40	0.60	7.29	ESMH6R3VSN823MA40S
	100,000	35×45	0.60	8.31	ESMH6R3VSN104MA45S
10	12,000	22×25	0.50	2.39	ESMH100VSN123MP25S
	15,000	22×30	0.50	2.76	ESMH100VSN153MP30S
	15,000	25.4×25	0.50	2.77	ESMH100VSN153MQ25S
	18,000	22×35	0.50	3.12	ESMH100VSN183MP35S
	18,000	25.4×25	0.50	3.04	ESMH100VSN183MQ25S
	22,000	22×40	0.50	3.55	ESMH100VSN223MP40S
	22,000	25.4×30	0.50	3.48	ESMH100VSN223MQ30S
	22,000	30×25	0.50	3.53	ESMH100VSN223MR25S
	27,000	22×45	0.50	4.04	ESMH100VSN273MP45S
	27,000	25.4×35	0.50	3.98	ESMH100VSN273MQ35S
	27,000	30×30	0.50	3.73	ESMH100VSN273MR30S
	27,000	35×25	0.50	3.73	ESMH100VSN273MA25S
	33,000	22×50	0.50	4.58	ESMH100VSN333MP50S
	33,000	25.4×40	0.50	4.54	ESMH100VSN333MQ40S
	33,000	30×30	0.50	4.13	ESMH100VSN333MR30S
	33,000	35×25	0.50	4.13	ESMH100VSN333MA25S
	39,000	25.4×45	0.50	5.08	ESMH100VSN393MQ45S
	39,000	30×35	0.50	5.05	ESMH100VSN393MR35S
	39,000	35×30	0.50	4.80	ESMH100VSN393MA35S
	47,000	25.4×50	0.50	5.73	ESMH100VSN473MQ50S
	47,000	30×40	0.50	5.72	ESMH100VSN473MR40S
	47,000	35×30	0.50	5.27	ESMH100VSN473MA30S
	56,000	30×45	0.50	6.44	ESMH100VSN563MR45S
	56,000	35×35	0.50	6.38	ESMH100VSN563MA35S
	68,000	30×50	0.50	7.27	ESMH100VSN683MR50S
	68,000	35×40	0.50	7.27	ESMH100VSN683MA40S
	82,000	35×50	0.50	8.49	ESMH100VSN823MA50S
16	8,200	22×25	0.40	2.51	ESMH160VSN822MP25S
	10,000	22×25	0.40	2.77	ESMH160VSN103MP25S
	12,000	22×30	0.40	2.86	ESMH160VSN123MP30S
	12,000	25.4×25	0.40	2.95	ESMH160VSN123MQ25S
	15,000	22×35	0.40	3.29	ESMH160VSN153MP35S
	15,000	25.4×30	0.40	3.46	ESMH160VSN153MQ30S
	15,000	30×25	0.40	3.66	ESMH160VSN153MR25S
	18,000	22×40	0.40	3.72	ESMH160VSN183MP40S
	18,000	25.4×35	0.40	3.98	ESMH160VSN183MQ35S
	18,000	30×25	0.40	4.00	ESMH160VSN183MR25S
	22,000	22×50	0.40	4.37	ESMH160VSN223MP50S
	22,000	25.4×40	0.40	4.26	ESMH160VSN223MQ40S
	22,000	30×30	0.40	4.21	ESMH160VSN223MR30S
	22,000	35×25	0.40	4.15	ESMH160VSN223MA25S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
16	27,000	25.4×45	0.40	4.72	ESMH160VSN273MQ45S
	27,000	30×35	0.40	4.82	ESMH160VSN273MR35S
	27,000	35×30	0.40	4.65	ESMH160VSN273MA30S
	33,000	25.4×50	0.40	5.33	ESMH160VSN333MQ50S
	33,000	30×40	0.40	5.36	ESMH160VSN333MR40S
	33,000	35×30	0.40	5.15	ESMH160VSN333MA30S
	39,000	30×45	0.40	6.01	ESMH160VSN393MR45S
	39,000	35×35	0.40	5.95	ESMH160VSN393MA35S
	47,000	30×50	0.40	6.79	ESMH160VSN473MR50S
	47,000	35×40	0.40	6.76	ESMH160VSN473MA40S
	56,000	35×45	0.40	7.62	ESMH160VSN563MA45S
	68,000	35×50	0.40	8.63	ESMH160VSN683MA50S
25	5,600	22×25	0.30	2.21	ESMH250VSN562MP25S
	6,800	22×30	0.30	2.40	ESMH250VSN682MP30S
	6,800	25.4×25	0.30	2.56	ESMH250VSN682MQ25S
	8,200	22×35	0.30	2.72	ESMH250VSN822MP35S
	8,200	25.4×25	0.30	2.80	ESMH250VSN822MQ25S
	10,000	22×40	0.30	3.09	ESMH250VSN103MP40S
	10,000	25.4×30	0.30	3.12	ESMH250VSN103MQ30S
	10,000	30×25	0.30	3.21	ESMH250VSN103MR25S
	12,000	22×45	0.30	3.48	ESMH250VSN123MP45S
	12,000	25.4×35	0.30	3.43	ESMH250VSN123MQ35S
	12,000	30×30	0.30	3.86	ESMH250VSN123MR30S
	12,000	35×25	0.30	3.54	ESMH250VSN123MA25S
	15,000	22×50	0.30	4.00	ESMH250VSN153MP50S
	15,000	25.4×40	0.30	3.95	ESMH250VSN153MQ40S
	15,000	30×30	0.30	4.00	ESMH250VSN153MR30S
	15,000	35×25	0.30	3.95	ESMH250VSN153MA25S
	18,000	25.4×45	0.30	4.45	ESMH250VSN183MQ45S
	18,000	30×35	0.30	4.46	ESMH250VSN183MR35S
	18,000	35×30	0.30	4.63	ESMH250VSN183MA30S
	22,000	25.4×50	0.30	5.02	ESMH250VSN223MQ50S
	22,000	30×45	0.30	5.21	ESMH250VSN223MR45S
	22,000	35×35	0.30	5.16	ESMH250VSN223MA35S
	27,000	30×50	0.30	5.94	ESMH250VSN273MR50S
	27,000	35×40	0.30	5.92	ESMH250VSN273MA40S
	33,000	35×45	0.30	6.75	ESMH250VSN333MA45S
	39,000	35×50	0.30	7.56	ESMH250VSN393MA50S
35	3,900	22×25	0.25	2.22	ESMH350VSN392MP25S
	4,700	22×30	0.25	2.41	ESMH350VSN472MP30S
	4,700	25.4×25	0.25	2.42	ESMH350VSN472MQ25S
	5,600	22×35	0.25	2.75	ESMH350VSN562MP35S
	5,600	25.4×25	0.25	2.64	ESMH350VSN562MQ25S
	6,800	22×40	0.25	2.80	ESMH350VSN682MP40S
	6,800	25.4×30	0.25	2.74	ESMH350VSN682MQ30S
	6,800	30×25	0.25	2.97	ESMH350VSN682MR25S
	8,200	22×45	0.25	3.47	ESMH350VSN822MP45S
	8,200	25.4×35	0.25	3.10	ESMH350VSN822MQ35S
	8,200	30×30	0.25	3.13	ESMH350VSN822MR30S
	8,200	35×25	0.25	2.73	ESMH350VSN822MA25S
	10,000	22×50	0.25	3.57	ESMH350VSN103MP50S
	10,000	25.4×40	0.25	3.53	ESMH350VSN103MQ40S
	10,000	30×30	0.25	3.46	ESMH350VSN103MR30S
	10,000	35×25	0.25	3.02	ESMH350VSN103MA25S
	12,000	25.4×45	0.25	3.98	ESMH350VSN123MQ45S
	12,000	30×35	0.25	4.01	ESMH350VSN123MR35S
	12,000	35×30	0.25	4.42	ESMH350VSN123MA30S
	15,000	25.4×50	0.25	4.54	ESMH350VSN153MQ50S
	15,000	30×40	0.25	4.52	ESMH350VSN153MR40S
	15,000	35×35	0.25	5.01	ESMH350VSN153MA35S
	18,000	30×45	0.25	4.71	ESMH350VSN183MR45S
	18,000	35×40	0.25	5.54	ESMH350VSN183MA40S
	22,000	30×50	0.25	5.33	ESMH350VSN223MR50S
	22,000	35×45	0.25	6.04	ESMH350VSN223MA45S
	27,000	35×50	0.25	6.89	ESMH350VSN273MA50S
50	2,200	22×25	0.20	1.91	ESMH500VSN222MP25S
	3,300	22×30	0.20	2.37	ESMH500VSN332MP30S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard snap-ins, 85℃

SMH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
50	3,300	25.4×25	0.20	2.38	ESMH500VSN332MQ25S
	3,900	22×35	0.20	2.65	ESMH500VSN392MP35S
	3,900	25.4×30	0.20	2.68	ESMH500VSN392MQ30S
	3,900	30×25	0.20	2.55	ESMH500VSN392MR25S
	4,700	22×40	0.20	2.99	ESMH500VSN472MP40S
	4,700	25.4×35	0.20	3.03	ESMH500VSN472MQ35S
	4,700	30×25	0.20	2.81	ESMH500VSN472MR25S
	5,600	22×45	0.20	3.36	ESMH500VSN562MP45S
	5,600	25.4×35	0.20	3.31	ESMH500VSN562MQ35S
	5,600	30×30	0.20	3.37	ESMH500VSN562MR30S
	5,600	35×25	0.20	3.42	ESMH500VSN562MA25S
	6,800	22×50	0.20	3.81	ESMH500VSN682MP50S
	6,800	25.4×40	0.20	3.81	ESMH500VSN682MQ40S
	6,800	30×35	0.20	3.85	ESMH500VSN682MR35S
	6,800	35×30	0.20	3.85	ESMH500VSN682MA30S
	8,200	25.4×50	0.20	4.37	ESMH500VSN822MQ50S
	8,200	30×40	0.20	4.36	ESMH500VSN822MR40S
	8,200	35×30	0.20	4.41	ESMH500VSN822MA30S
	10,000	30×45	0.20	4.97	ESMH500VSN103MR45S
	10,000	35×35	0.20	4.92	ESMH500VSN103MA35S
	12,000	30×50	0.20	5.60	ESMH500VSN123MR50S
	12,000	35×40	0.20	5.58	ESMH500VSN123MA40S
	15,000	35×45	0.20	6.44	ESMH500VSN153MA45S
	18,000	35×50	0.20	6.71	ESMH500VSN183MA50S
63	1,800	22×25	0.15	1.82	ESMH630VSN182MP25S
	2,200	22×30	0.15	2.31	ESMH630VSN222MP30S
	2,200	25.4×25	0.15	2.30	ESMH630VSN222MQ25S
	2,700	22×35	0.15	2.40	ESMH630VSN272MP35S
	2,700	25.4×25	0.15	2.40	ESMH630VSN272MQ25S
	3,300	22×35	0.15	2.62	ESMH630VSN332MP35S
	3,300	25.4×30	0.15	2.64	ESMH630VSN332MQ30S
	3,300	30×25	0.15	2.78	ESMH630VSN332MR25S
	3,900	22×40	0.15	2.93	ESMH630VSN392MP40S
	3,900	25.4×35	0.15	2.97	ESMH630VSN392MQ35S
	3,900	30×30	0.15	3.00	ESMH630VSN392MR30S
	3,900	35×25	0.15	3.00	ESMH630VSN392MA25S
	4,700	22×50	0.15	3.39	ESMH630VSN472MP50S
	4,700	25.4×40	0.15	3.36	ESMH630VSN472MQ40S
	4,700	30×30	0.15	3.32	ESMH630VSN472MR30S
	4,700	35×25	0.15	3.36	ESMH630VSN472MA25S
	5,600	25.4×45	0.15	3.77	ESMH630VSN562MQ45S
	5,600	30×35	0.15	3.75	ESMH630VSN562MR35S
	5,600	35×30	0.15	3.76	ESMH630VSN562MA30S
	6,800	25.4×50	0.15	4.27	ESMH630VSN682MQ50S
	6,800	30×40	0.15	4.27	ESMH630VSN682MR40S
	6,800	35×30	0.15	4.15	ESMH630VSN682MA30S
	8,200	30×45	0.15	4.83	ESMH630VSN822MR45S
	8,200	35×35	0.15	4.79	ESMH630VSN822MA35S
	10,000	30×50	0.15	5.49	ESMH630VSN103MR50S
	10,000	35×40	0.15	5.47	ESMH630VSN103MA40S
	12,000	35×45	0.15	6.19	ESMH630VSN123MA45S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
80	1,200	22×25	0.15	1.69	ESMH800VSN122MP25S
	1,500	22×25	0.15	1.88	ESMH800VSN152MP25S
	1,800	22×30	0.15	2.14	ESMH800VSN182MP30S
	1,800	25.4×25	0.15	2.26	ESMH800VSN182MQ25S
	2,200	22×35	0.15	2.44	ESMH800VSN222MP35S
	2,200	25.4×30	0.15	2.46	ESMH800VSN222MQ30S
	2,200	30×25	0.15	2.49	ESMH800VSN222MR25S
	2,700	22×40	0.15	2.78	ESMH800VSN272MP40S
	2,700	25.4×35	0.15	2.81	ESMH800VSN272MQ35S
	2,700	30×25	0.15	2.75	ESMH800VSN272MR25S
	3,300	22×45	0.15	3.16	ESMH800VSN332MP45S
	3,300	25.4×40	0.15	3.21	ESMH800VSN332MQ40S
	3,300	30×30	0.15	3.17	ESMH800VSN332MR30S
	3,300	35×25	0.15	3.21	ESMH800VSN332MA25S
	3,900	22×50	0.15	3.52	ESMH800VSN392MP50S
	3,900	25.4×45	0.15	3.59	ESMH800VSN392MQ45S
	3,900	30×35	0.15	3.57	ESMH800VSN392MR35S
	3,900	35×25	0.15	3.50	ESMH800VSN392MA25S
	4,700	25.4×50	0.15	4.05	ESMH800VSN472MQ50S
	4,700	30×40	0.15	4.05	ESMH800VSN472MR40S
	4,700	35×30	0.15	4.09	ESMH800VSN472MA30S
	5,600	30×45	0.15	4.55	ESMH800VSN562MR45S
	5,600	35×35	0.15	4.51	ESMH800VSN562MA35S
	6,800	30×50	0.15	5.16	ESMH800VSN682MR50S
	6,800	35×40	0.15	5.14	ESMH800VSN682MA40S
	8,200	35×45	0.15	5.83	ESMH800VSN822MA45S
	10,000	35×50	0.15	6.63	ESMH800VSN103MA50S
100	820	22×25	0.15	1.86	ESMH101VSN821MP25S
	1,200	22×30	0.15	2.09	ESMH101VSN122MP30S
	1,200	25.4×25	0.15	2.10	ESMH101VSN122MQ25S
	1,500	22×35	0.15	2.41	ESMH101VSN152MP35S
	1,500	25.4×30	0.15	2.43	ESMH101VSN152MQ30S
	1,500	30×25	0.15	2.46	ESMH101VSN152MR25S
	1,800	22×40	0.15	2.71	ESMH101VSN182MP40S
	1,800	25.4×35	0.15	2.75	ESMH101VSN182MQ35S
	1,800	30×25	0.15	2.72	ESMH101VSN182MR25S
	2,200	22×45	0.15	3.08	ESMH101VSN222MP45S
	2,200	25.4×40	0.15	3.13	ESMH101VSN222MQ40S
	2,200	30×30	0.15	3.09	ESMH101VSN222MR30S
	2,200	35×25	0.15	3.14	ESMH101VSN222MA25S
	2,700	22×50	0.15	3.53	ESMH101VSN272MP50S
	2,700	25.4×45	0.15	3.57	ESMH101VSN272MQ45S
	2,700	30×35	0.15	3.55	ESMH101VSN272MR35S
	2,700	35×30	0.15	3.71	ESMH101VSN272MA30S
	3,300	25.4×50	0.15	4.06	ESMH101VSN332MQ50S
	3,300	30×40	0.15	4.05	ESMH101VSN332MR40S
	3,300	35×30	0.15	4.05	ESMH101VSN332MA30S
	3,900	30×45	0.15	4.54	ESMH101VSN392MR45S
	3,900	35×35	0.15	4.49	ESMH101VSN392MA35S
	4,700	30×50	0.15	5.13	ESMH101VSN472MR50S
	4,700	35×40	0.15	5.11	ESMH101VSN472MA40S
	5,600	35×45	0.15	5.75	ESMH101VSN562MA45S
	6,800	35×50	0.15	6.50	ESMH101VSN682MA50S

*For the rated voltage≧160Vdc, please use SMQ series

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

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

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

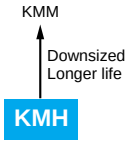
NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard snap-ins, 105℃

KMH Series

- Endurance with ripple current : 2,000 hours at 105℃
- Non solvent resistant type
- **RoHS Compliant**

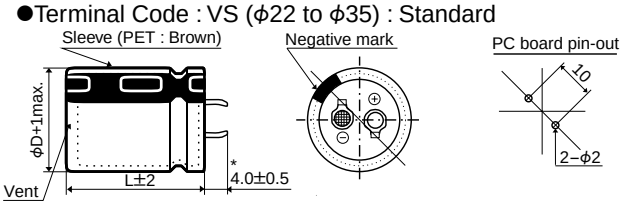


◆SPECIFICATIONS

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=0.02CV or 3mA, 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)	Rated voltage (Vdc)	6.3V	10V	16V	25V	35V	50V	63V	80V	100V	
	tanδ (Max.)	0.60	0.50	0.40	0.30	0.25	0.20	0.15	0.15	0.15	(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	4	4	3	3	2	2	2	2	
	Z(−40℃)/Z(+20℃)	15	15	15	10	8	6	6	5	5	(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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.										
	Capacitance change	≦±20% of the initial value									
	D.F. (tanδ)	≦150% of the initial specified value									
	Leakage current	≦The initial specified value									

◆DIMENSIONS [mm]

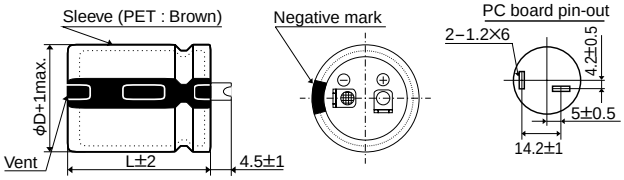
●Terminal Code : VS (ϕ22 to ϕ35) : Standard



*ϕD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

●Terminal Code : LI (ϕ35)



◆PART NUMBERING SYSTEM

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

- 18 : Supplement code
- 15–17 : Size code
- 14 : Capacitance tolerance code
- 11–13 : Capacitance code (ex. 820μF:821, 3,300μF:332)
- 10 : Dummy terminal code
- 8–9 : Terminal code (VS, LI)
- 5–7 : Voltage code (ex. 6.3V:6R3, 10V:100, 100V:101)
- 2–4 : Series code
- 1 : Category

Please refer to "Product code guide (snap-in type)"

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard snap-ins, 105℃

KMH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
6.3	12,000	22×25	0.60	1.54	EKMH6R3VSN123MP25S
	15,000	22×25	0.60	1.72	EKMH6R3VSN153MP25S
	18,000	22×30	0.60	1.95	EKMH6R3VSN183MP30S
	18,000	25.4×25	0.60	1.96	EKMH6R3VSN183MQ25S
	22,000	22×35	0.60	2.23	EKMH6R3VSN223MP35S
	22,000	25.4×30	0.60	2.25	EKMH6R3VSN223MQ30S
	22,000	30×25	0.60	2.28	EKMH6R3VSN223MR25S
	27,000	22×40	0.60	2.54	EKMH6R3VSN273MP40S
	27,000	25.4×35	0.60	2.57	EKMH6R3VSN273MQ35S
	27,000	30×25	0.60	2.52	EKMH6R3VSN273MR25S
	33,000	22×45	0.60	2.88	EKMH6R3VSN333MP45S
	33,000	25.4×40	0.60	2.93	EKMH6R3VSN333MQ40S
	33,000	30×30	0.60	2.89	EKMH6R3VSN333MR30S
	33,000	35×25	0.60	2.93	EKMH6R3VSN333MA25S
	39,000	25.4×40	0.60	3.18	EKMH6R3VSN393MQ40S
	39,000	30×35	0.60	3.26	EKMH6R3VSN393MR35S
	39,000	35×30	0.60	3.40	EKMH6R3VSN393MA30S
	47,000	25.4×50	0.60	3.69	EKMH6R3VSN473MQ50S
	47,000	30×40	0.60	3.69	EKMH6R3VSN473MR40S
	47,000	35×30	0.60	3.73	EKMH6R3VSN473MA30S
	56,000	30×45	0.60	4.16	EKMH6R3VSN563MR45S
	56,000	35×35	0.60	4.12	EKMH6R3VSN563MA35S
	68,000	30×50	0.60	4.71	EKMH6R3VSN683MR50S
	68,000	35×40	0.60	4.69	EKMH6R3VSN683MA40S
	82,000	35×45	0.60	5.32	EKMH6R3VSN823MA45S
10	10,000	22×25	0.50	1.55	EKMH100VSN103MP25S
	12,000	22×30	0.50	1.77	EKMH100VSN123MP30S
	15,000	22×30	0.50	1.97	EKMH100VSN153MP30S
	15,000	25.4×25	0.50	1.96	EKMH100VSN153MQ25S
	18,000	22×35	0.50	2.21	EKMH100VSN183MP35S
	18,000	25.4×30	0.50	2.23	EKMH100VSN183MQ30S
	22,000	22×40	0.50	2.51	EKMH100VSN223MP40S
	22,000	25.4×35	0.50	2.54	EKMH100VSN223MQ35S
	22,000	30×25	0.50	2.40	EKMH100VSN223MR25S
	27,000	22×50	0.50	2.93	EKMH100VSN273MP50S
	27,000	25.4×40	0.50	2.90	EKMH100VSN273MQ40S
	27,000	30×30	0.50	2.87	EKMH100VSN273MR30S
	27,000	35×25	0.50	2.73	EKMH100VSN273MA25S
	33,000	25.4×45	0.50	3.30	EKMH100VSN333MQ45S
	33,000	30×35	0.50	3.28	EKMH100VSN333MR35S
	33,000	35×30	0.50	3.16	EKMH100VSN333MA30S
	39,000	25.4×50	0.50	3.68	EKMH100VSN393MQ50S
	39,000	30×40	0.50	3.69	EKMH100VSN393MR40S
	39,000	35×30	0.50	3.43	EKMH100VSN393MA30S
	47,000	30×45	0.50	4.17	EKMH100VSN473MR45S
	47,000	35×35	0.50	3.76	EKMH100VSN473MA35S
	56,000	30×50	0.50	4.68	EKMH100VSN563MR50S
	56,000	35×40	0.50	4.67	EKMH100VSN563MA40S
	68,000	35×50	0.50	5.46	EKMH100VSN683MA50S
16	6,800	22×25	0.40	1.57	EKMH160VSN682MP25S
	10,000	22×30	0.40	1.97	EKMH160VSN103MP30S
	1,0000	25.4×25	0.40	1.97	EKMH160VSN103MQ25S
	12,000	22×35	0.40	2.22	EKMH160VSN123MP35S
	12,000	25.4×30	0.40	2.24	EKMH160VSN123MQ30S
	12,000	30×25	0.40	2.45	EKMH160VSN123MR25S
	15,000	22×40	0.40	2.55	EKMH160VSN153MP40S
	15,000	25.4×35	0.40	2.58	EKMH160VSN153MQ35S
	15,000	30×25	0.40	2.52	EKMH160VSN153MR25S
	18,000	22×45	0.40	2.87	EKMH160VSN183MP45S
	18,000	25.4×40	0.40	2.92	EKMH160VSN183MQ40S
	18,000	30×30	0.40	2.88	EKMH160VSN183MR30S
	18,000	35×25	0.40	2.92	EKMH160VSN183MA25S
	22,000	25.4×45	0.40	3.32	EKMH160VSN223MQ45S
	22,000	30×35	0.40	3.29	EKMH160VSN223MR35S
	22,000	35×25	0.40	3.23	EKMH160VSN223MA25S
	27,000	25.4×50	0.40	3.78	EKMH160VSN273MQ50S
	27,000	30×40	0.40	3.77	EKMH160VSN273MR40S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
16	27,000	35×30	0.40	3.45	EKMH160VSN273MA30S
	33,000	30×45	0.40	4.30	EKMH160VSN333MR45S
	33,000	35×35	0.40	4.26	EKMH160VSN333MA35S
	39,000	30×50	0.40	4.81	EKMH160VSN393MR50S
	39,000	35×40	0.40	4.79	EKMH160VSN393MA40S
	47,000	35×45	0.40	5.43	EKMH160VSN473MA45S
25	4,700	22×25	0.30	1.50	EKMH250VSN472MP25S
	5,600	22×25	0.30	1.63	EKMH250VSN562MP25S
	6,800	22×30	0.30	1.86	EKMH250VSN682MP30S
	6,800	25.4×25	0.30	1.87	EKMH250VSN682MQ25S
	8,200	22×35	0.30	2.11	EKMH250VSN822MP35S
	8,200	25.4×30	0.30	2.12	EKMH250VSN822MQ30S
	8,200	30×25	0.30	2.15	EKMH250VSN822MR25S
	10,000	22×40	0.30	2.39	EKMH250VSN103MP40S
	10,000	25.4×35	0.30	2.42	EKMH250VSN103MQ35S
	10,000	30×25	0.30	2.37	EKMH250VSN103MR25S
	12,000	22×45	0.30	2.69	EKMH250VSN123MP45S
	12,000	25.4×40	0.30	2.74	EKMH250VSN123MQ40S
	12,000	30×30	0.30	2.70	EKMH250VSN123MR30S
	12,000	35×25	0.30	2.74	EKMH250VSN123MA25S
	15,000	25.4×45	0.30	3.15	EKMH250VSN153MQ45S
	15,000	30×35	0.30	3.13	EKMH250VSN153MR35S
	15,000	35×30	0.30	3.27	EKMH250VSN153MA30S
	18,000	25.4×50	0.30	3.54	EKMH250VSN183MQ50S
	18,000	30×40	0.30	3.54	EKMH250VSN183MR40S
	18,000	35×30	0.30	3.58	EKMH250VSN183MA30S
	22,000	30×45	0.30	4.04	EKMH250VSN223MR45S
	22,000	35×35	0.30	3.64	EKMH250VSN223MA35S
	27,000	35×45	0.30	4.73	EKMH250VSN273MA45S
	33,000	35×50	0.30	5.39	EKMH250VSN333MA50S
35	3,300	22×25	0.25	1.40	EKMH350VSN332MP25S
	3,900	22×30	0.25	1.57	EKMH350VSN392MP30S
	4,700	22×30	0.25	1.72	EKMH350VSN472MP30S
	4,700	25.4×25	0.25	1.80	EKMH350VSN472MQ25S
	5,600	22×35	0.25	1.95	EKMH350VSN562MP35S
	5,600	25.4×30	0.25	1.96	EKMH350VSN562MQ30S
	5,600	30×25	0.25	1.99	EKMH350VSN562MR25S
	6,800	22×40	0.25	2.20	EKMH350VSN682MP40S
	6,800	25.4×35	0.25	2.23	EKMH350VSN682MQ35S
	6,800	30×25	0.25	2.19	EKMH350VSN682MR25S
	8,200	22×50	0.25	2.55	EKMH350VSN822MP50S
	8,200	25.4×40	0.25	2.53	EKMH350VSN822MQ40S
	8,200	30×30	0.25	2.75	EKMH350VSN822MR30S
	8,200	35×25	0.25	2.75	EKMH350VSN822MA25S
	10,000	25.4×45	0.25	2.87	EKMH350VSN103MQ45S
	10,000	30×35	0.25	2.90	EKMH350VSN103MR35S
	10,000	35×30	0.25	2.91	EKMH350VSN103MA30S
	12,000	25.4×50	0.25	3.24	EKMH350VSN123MQ50S
	12,000	30×40	0.25	3.23	EKMH350VSN123MR40S
	12,000	35×30	0.25	2.99	EKMH350VSN123MA30S
	15,000	30×45	0.25	3.72	EKMH350VSN153MR45S
	15,000	35×35	0.25	3.67	EKMH350VSN153MA35S
	18,000	35×40	0.25	4.37	EKMH350VSN183MA40S
	22,000	35×50	0.25	4.92	EKMH350VSN223MA50S
50	1,800	22×25	0.20	1.33	EKMH500VSN182MP25S
	2,700	22×30	0.20	1.69	EKMH500VSN272MP30S
	2,700	25.4×25	0.20	1.70	EKMH500VSN272MQ25S
	3,300	22×35	0.20	1.93	EKMH500VSN332MP35S
	3,300	25.4×30	0.20	1.85	EKMH500VSN332MQ30S
	3,900	22×40	0.20	2.16	EKMH500VSN392MP40S
	3,900	25.4×35	0.20	2.18	EKMH500VSN392MQ35S
	3,900	30×25	0.20	1.95	EKMH500VSN392MR25S
	4,700	22×45	0.20	2.43	EKMH500VSN472MP45S
	4,700	25.4×35	0.20	2.39	EKMH500VSN472MQ35S
	4,700	30×30	0.20	2.25	EKMH500VSN472MR30S
	4,700	35×25	0.20	2.48	EKMH500VSN472MA25S
	5,600	22×50	0.20	2.75	EKMH500VSN562MP50S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard snap-ins, 105℃

KMH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
50	5,600	25.4×40	0.20	2.70	EKMH500VSN562MQ40S
	5,600	30×35	0.20	2.76	EKMH500VSN562MR35S
	5,600	35×25	0.20	2.70	EKMH500VSN562MA25S
	6,800	25.4×50	0.20	3.30	EKMH500VSN682MQ50S
	6,800	30×40	0.20	3.30	EKMH500VSN682MR40S
	6,800	35×30	0.20	3.25	EKMH500VSN682MA30S
	8,200	30×45	0.20	3.60	EKMH500VSN822MR45S
	8,200	35×35	0.20	3.55	EKMH500VSN822MA35S
	10,000	30×50	0.20	4.04	EKMH500VSN103MR50S
	10,000	35×40	0.20	4.03	EKMH500VSN103MA40S
	12,000	35×45	0.20	4.55	EKMH500VSN123MA45S
63	1,200	22×25	0.15	1.19	EKMH630VSN122MP25S
	1,500	22×25	0.15	1.33	EKMH630VSN152MP25S
	1,800	22×30	0.15	1.51	EKMH630VSN182MP30S
	1,800	25.4×25	0.15	1.52	EKMH630VSN182MQ25S
	2,200	22×35	0.15	1.73	EKMH630VSN222MP35S
	2,200	25.4×30	0.15	1.74	EKMH630VSN222MQ30S
	2,700	22×40	0.15	1.97	EKMH630VSN272MP40S
	2,700	25.4×35	0.15	1.99	EKMH630VSN272MQ35S
	2,700	30×25	0.15	1.76	EKMH630VSN272MR25S
	3,300	22×50	0.15	2.29	EKMH630VSN332MP50S
	3,300	25.4×40	0.15	2.27	EKMH630VSN332MQ40S
	3,300	30×30	0.15	2.24	EKMH630VSN332MR30S
	3,300	35×25	0.15	2.06	EKMH630VSN332MA25S
	3,900	25.4×45	0.15	2.54	EKMH630VSN392MQ45S
	3,900	30×35	0.15	2.55	EKMH630VSN392MR35S
	3,900	35×25	0.15	2.24	EKMH630VSN392MA25S
	4,700	25.4×50	0.15	2.86	EKMH630VSN472MQ50S
	4,700	30×40	0.15	2.86	EKMH630VSN472MR40S
	4,700	35×30	0.15	2.79	EKMH630VSN472MA30S
	5,600	30×45	0.15	3.22	EKMH630VSN562MR45S
	5,600	35×35	0.15	3.19	EKMH630VSN562MA35S
	6,800	30×50	0.15	3.65	EKMH630VSN682MR50S
	6,800	35×40	0.15	3.64	EKMH630VSN682MA40S
	8,200	35×45	0.15	3.90	EKMH630VSN822MA45S
	10,000	35×50	0.15	4.40	EKMH630VSN103MA50S
80	820	22×25	0.15	1.11	EKMH800VSN821MP25S
	1,000	22×25	0.15	1.22	EKMH800VSN102MP25S
	1,200	22×30	0.15	1.38	EKMH800VSN122MP30S
	1,200	25.4×25	0.15	1.39	EKMH800VSN122MQ25S
	1,500	22×35	0.15	1.59	EKMH800VSN152MP35S
	1,500	25.4×30	0.15	1.61	EKMH800VSN152MQ30S
	1,800	22×40	0.15	1.80	EKMH800VSN182MP40S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
80	1,800	25.4×30	0.15	1.76	EKMH800VSN182MQ30S
	1,800	30×25	0.15	1.65	EKMH800VSN182MR25S
	2,200	22×45	0.15	2.04	EKMH800VSN222MP45S
	2,200	25.4×35	0.15	2.01	EKMH800VSN222MQ35S
	2,200	30×30	0.15	2.05	EKMH800VSN222MR30S
	2,200	35×25	0.15	2.07	EKMH800VSN222MA25S
	2,700	25.4×45	0.15	2.36	EKMH800VSN272MQ45S
	2,700	30×35	0.15	2.35	EKMH800VSN272MR35S
	2,700	35×25	0.15	2.29	EKMH800VSN272MA25S
	3,300	25.4×50	0.15	2.68	EKMH800VSN332MQ50S
	3,300	30×40	0.15	2.68	EKMH800VSN332MR40S
	3,300	35×30	0.15	2.45	EKMH800VSN332MA30S
	3,900	30×45	0.15	3.00	EKMH800VSN392MR45S
	3,900	35×35	0.15	2.98	EKMH800VSN392MA35S
	4,700	30×50	0.15	3.39	EKMH800VSN472MR50S
	4,700	35×40	0.15	3.38	EKMH800VSN472MA40S
	5,600	35×45	0.15	3.80	EKMH800VSN562MA45S
	6,800	35×50	0.15	3.90	EKMH800VSN682MA50S
100	560	22×25	0.15	1.05	EKMH101VSN561MP25S
	820	22×30	0.15	1.32	EKMH101VSN821MP30S
	820	25.4×25	0.15	1.33	EKMH101VSN821MQ25S
	1,000	22×35	0.15	1.50	EKMH101VSN102MP35S
	1,000	25.4×30	0.15	1.51	EKMH101VSN102MQ30S
	1,200	22×40	0.15	1.69	EKMH101VSN122MP40S
	1,200	25.4×35	0.15	1.71	EKMH101VSN122MQ35S
	1,200	30×25	0.15	1.68	EKMH101VSN122MR25S
	1,500	22×45	0.15	1.94	EKMH101VSN152MP45S
	1,500	25.4×40	0.15	1.98	EKMH101VSN152MQ40S
	1,500	30×30	0.15	1.95	EKMH101VSN152MR30S
	1,500	35×25	0.15	1.98	EKMH101VSN152MA25S
	1,800	25.4×45	0.15	2.23	EKMH101VSN182MQ45S
	1,800	30×35	0.15	2.50	EKMH101VSN182MR35S
	1,800	35×25	0.15	2.17	EKMH101VSN182MA25S
	2,200	25.4×50	0.15	2.53	EKMH101VSN222MQ50S
	2,200	30×40	0.15	2.70	EKMH101VSN222MR40S
	2,200	35×30	0.15	2.50	EKMH101VSN222MA30S
	2,700	30×45	0.15	2.88	EKMH101VSN272MR45S
	2,700	35×35	0.15	2.86	EKMH101VSN272MA35S
	3,300	30×50	0.15	3.28	EKMH101VSN332MR50S
	3,300	35×40	0.15	3.27	EKMH101VSN332MA40S
	3,900	35×45	0.15	3.67	EKMH101VSN392MA45S
	4,700	35×50	0.15	3.80	EKMH101VSN472MA50S

*For the rated voltage≧160Vdc, please use KMR and KMQ series

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

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

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

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS 15mm height snap-ins, 85℃

SLM Series

- ●15mm height snap-ins
- ●Endurance with ripple current : 2,000 hours at 85℃
- ●Non solvent resistant type
- ●**RoHS Compliant**

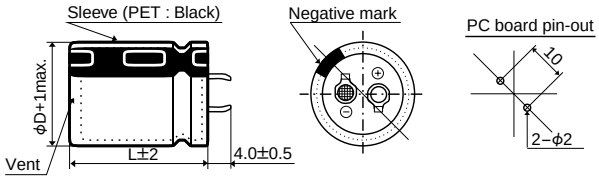
SLM
Low profile
SMH

◆SPECIFICATIONS

Items	Characteristics		
Category Temperature Range	−25 to +85℃		
Rated Voltage Range	160 to 400Vdc		
Capacitance Tolerance	±20% (M)		(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)		(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 400V	
	tanδ (Max.)	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 400V	
	Z (−25℃) /Z (+20℃)	4	(at 120Hz)
Endurace	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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.		
	Capacitance change	≦±15% of the initial value	
	D.F. (tanδ)	≦150% of the initial specified value	
	Leakage current	≦The initial specified value	

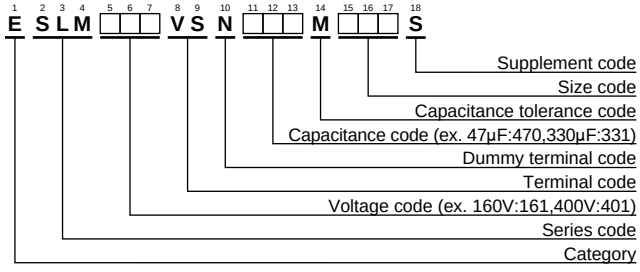
◆DIMENSIONS [mm]

●Terminal Code : VS



The standard design has no plastic disc.

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

◆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
400Vdc	0.77	1.00	1.16	1.30	1.41	1.43

The endurance of capacitors is reduced 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.

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size ϕD×L(mm)	tanδ	Rated ripple current (Arms/ 85℃,120Hz)	Part No.
160	180	22×15	0.20	0.99	ESLM161VSN181MP15S
	270	25.4×15	0.20	1.29	ESLM161VSN271MQ15S
	390	30×15	0.20	1.47	ESLM161VSN391MR15S
	560	35×15	0.20	1.74	ESLM161VSN561MA15S
180	150	22×15	0.20	0.90	ESLM181VSN151MP15S
	220	25.4×15	0.20	1.16	ESLM181VSN221MQ15S
	330	30×15	0.20	1.35	ESLM181VSN331MR15S
	470	35×15	0.20	1.60	ESLM181VSN471MA15S
200	150	22×15	0.20	0.90	ESLM201VSN151MP15S
	220	25.4×15	0.20	1.16	ESLM201VSN221MQ15S
200	270	30×15	0.20	1.22	ESLM201VSN271MR15S
	390	35×15	0.20	1.46	ESLM201VSN391MA15S
250	100	22×15	0.20	0.73	ESLM251VSN101MP15S
	150	25.4×15	0.20	0.96	ESLM251VSN151MQ15S
	220	30×15	0.20	1.10	ESLM251VSN221MR15S
	330	35×15	0.20	1.34	ESLM251VSN331MA15S
400	47	22×15	0.20	0.50	ESLM401VSN470MP15S
	68	25.4×15	0.20	0.65	ESLM401VSN680MQ15S
	100	30×15	0.20	0.74	ESLM401VSN101MR15S
	120	35×15	0.20	0.81	ESLM401VSN121MA15S

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS 15mm height snap-ins, 105℃

KLM Series

- 15mm height snap-ins
- Endurance with ripple current : 2,000 hours at 105℃
- Non solvent resistant type
- **RoHS Compliant**

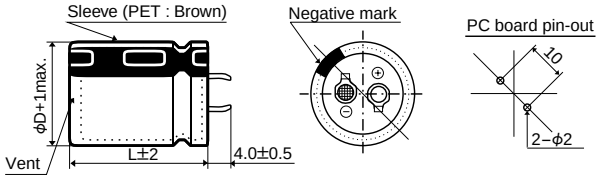
KLM
↑ Low profile
KMH

◆SPECIFICATIONS

Items	Characteristics		
Category Temperature Range	−25 to +105℃		
Rated Voltage Range	160 to 400Vdc		
Capacitance Tolerance	±20% (M)		(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)		(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 400V	
	tanδ (Max.)	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 400V	
	Z (−25℃) /Z (+20℃)	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 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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.		
	Capacitance change	≦±15% of the initial value	
	D.F. (tanδ)	≦150% of the initial specified value	
	Leakage current	≦The initial specified value	

◆DIMENSIONS [mm]

●Terminal Code : VS



The standard design has no plastic disc.

◆PART NUMBERING SYSTEM

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

- 18 Supplement code
- 15 16 17 Size code
- 14 Capacitance tolerance code
- 11 12 13 Capacitance code (ex. 47μF:470,100μF:101)
- 10 Dummy terminal code
- 9 Terminal code
- 8 Voltage code (ex. 160V:161,400V:401)
- 5 6 7 Series code
- 4 Category

Please refer to "Product code guide (snap-in type)"

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size ϕD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
160	150	22×15	0.20	0.68	EKLM161VSN151MP15S
	180	25.4×15	0.20	0.79	EKLM161VSN181MQ15S
	220	25.4×15	0.20	0.88	EKLM161VSN221MQ15S
	270	30×15	0.20	0.96	EKLM161VSN271MR15S
	330	30×15	0.20	1.06	EKLM161VSN331MR15S
	390	35×15	0.20	1.20	EKLM161VSN391MA15S
180	120	22×15	0.20	0.61	EKLM181VSN121MP15S
	150	25.4×15	0.20	0.73	EKLM181VSN151MQ15S
	180	25.4×15	0.20	0.79	EKLM181VSN181MQ15S
	220	30×15	0.20	0.86	EKLM181VSN221MR15S
	270	30×15	0.20	0.96	EKLM181VSN271MR15S
	330	35×15	0.20	1.10	EKLM181VSN331MA15S
	390	35×15	0.20	1.17	EKLM181VSN391MA15S
200	120	22×15	0.20	0.61	EKLM201VSN121MP15S
	150	25.4×15	0.20	0.73	EKLM201VSN151MQ15S
	180	30×15	0.20	0.79	EKLM201VSN181MR15S
200	220	30×15	0.20	0.90	EKLM201VSN221MR15S
	270	35×15	0.20	1.00	EKLM201VSN271MA15S
	330	35×15	0.20	1.07	EKLM201VSN331MA15S
250	82	22×15	0.20	0.50	EKLM251VSN820MP15S
	100	25.4×15	0.20	0.59	EKLM251VSN101MQ15S
	120	25.4×15	0.20	0.65	EKLM251VSN121MQ15S
	150	30×15	0.20	0.71	EKLM251VSN151MR15S
	180	30×15	0.20	0.79	EKLM251VSN181MR15S
	220	35×15	0.20	0.90	EKLM251VSN221MA15S
400	39	22×15	0.20	0.35	EKLM401VSN390MP15S
	47	25.4×15	0.20	0.40	EKLM401VSN470MQ15S
	56	25.4×15	0.20	0.44	EKLM401VSN560MQ15S
	68	30×15	0.20	0.46	EKLM401VSN680MR15S
	82	30×15	0.20	0.51	EKLM401VSN820MR15S
	100	35×15	0.20	0.56	EKLM401VSN101MA15S
	120	35×15	0.20	0.62	EKLM401VSN121MA15S

◆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
400Vdc	0.77	1.00	1.16	1.30	1.41	1.43

The endurance of capacitors is reduced 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.

CAT. No. E1001H

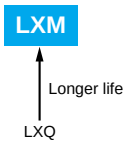
NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXM Series

- Endurance with ripple current : 7,000 hours at 105℃
- Non solvent resistant type
- **RoHS Compliant**

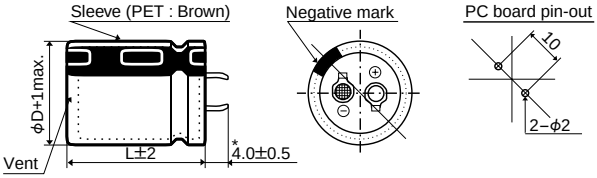


◆SPECIFICATIONS

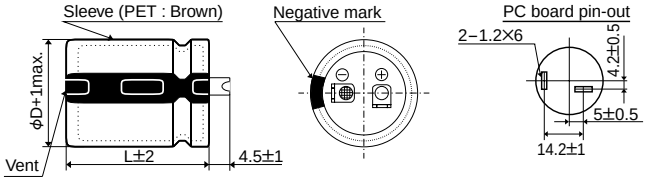
Items	Characteristics			
Category Temperature Range	−25 to +105℃			
Rated Voltage Range	160 to 450Vdc			
Capacitance Tolerance	±20% (M)			(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)			(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 400V	420 & 450V	
	tanδ (Max.)	0.15	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 400V	420 & 450V	
	Z(−25℃)/Z(+20℃)	4	8	(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 7,000 hours at 105℃.			
	Capacitance change	≦±20% of the initial value		
	D.F. (tanδ)	≦250% 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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.			
	Capacitance change	≦±15% of the initial value		
	D.F. (tanδ)	≦150% of the initial specified value		
	Leakage current	≦The initial specified value		

◆DIMENSIONS [mm]

●Terminal Code : VS (φ22 to φ35) : Standard



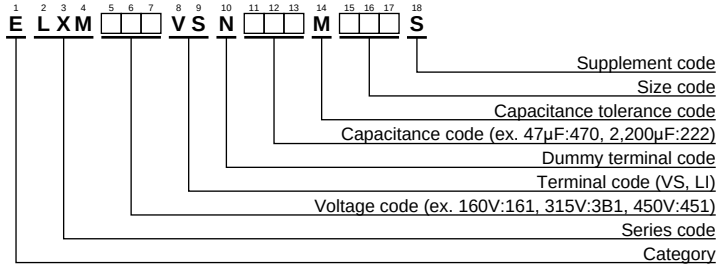
●Terminal Code : LI (φ35)



*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
160	330	22× 25	0.15	1.11	ELXM161VSN331MP25S
	390	22× 30	0.15	1.26	ELXM161VSN391MP30S
	470	22× 30	0.15	1.39	ELXM161VSN471MP30S
	470	25.4× 25	0.15	1.38	ELXM161VSN471MQ25S
	560	22× 35	0.15	1.55	ELXM161VSN561MP35S
	560	25.4× 30	0.15	1.55	ELXM161VSN561MQ30S
	680	22× 40	0.15	1.75	ELXM161VSN681MP40S
	680	25.4× 35	0.15	1.78	ELXM161VSN681MQ35S
	680	30× 25	0.15	1.74	ELXM161VSN681MR25S
	820	22× 50	0.15	1.97	ELXM161VSN821MP50S
	820	25.4× 40	0.15	2.01	ELXM161VSN821MQ40S
	820	30× 30	0.15	1.96	ELXM161VSN821MR30S
	1,000	25.4× 45	0.15	2.27	ELXM161VSN102MQ45S
	1,000	30× 35	0.15	2.26	ELXM161VSN102MR35S
	1,200	25.4× 50	0.15	2.54	ELXM161VSN122MQ50S
	1,200	30× 40	0.15	2.56	ELXM161VSN122MR40S
	1,200	35× 30	0.15	2.52	ELXM161VSN122MA30S
	1,500	30× 45	0.15	2.96	ELXM161VSN152MR45S
	1,500	35× 35	0.15	2.89	ELXM161VSN152MA35S
	1,800	30× 50	0.15	3.32	ELXM161VSN182MR50S
	1,800	35× 40	0.15	3.30	ELXM161VSN182MA40S
	2,200	35× 50	0.15	3.87	ELXM161VSN222MA50S
180	270	22× 25	0.15	1.00	ELXM181VSN271MP25S
	330	22× 30	0.15	1.16	ELXM181VSN331MP30S
	390	22× 30	0.15	1.26	ELXM181VSN391MP30S
	390	25.4× 25	0.15	1.26	ELXM181VSN391MQ25S
	470	22× 35	0.15	1.42	ELXM181VSN471MP35S
	470	25.4× 30	0.15	1.42	ELXM181VSN471MQ30S
	560	22× 40	0.15	1.59	ELXM181VSN561MP40S
	560	25.4× 30	0.15	1.55	ELXM181VSN561MQ30S
	560	30× 25	0.15	1.58	ELXM181VSN561MR25S
	680	22× 45	0.15	1.79	ELXM181VSN681MP45S
	680	25.4× 35	0.15	1.78	ELXM181VSN681MQ35S
	680	30× 30	0.15	1.79	ELXM181VSN681MR30S
	820	25.4× 40	0.15	2.01	ELXM181VSN821MQ40S
	820	30× 35	0.15	2.04	ELXM181VSN821MR35S
	1,000	25.4× 50	0.15	2.32	ELXM181VSN102MQ50S
	1,000	30× 35	0.15	2.26	ELXM181VSN102MR35S
	1,000	35× 30	0.15	2.30	ELXM181VSN102MA30S
	1,200	30× 45	0.15	2.65	ELXM181VSN122MR45S
	1,200	35× 35	0.15	2.58	ELXM181VSN122MA35S
	1,500	30× 50	0.15	3.03	ELXM181VSN152MR50S
	1,500	35× 40	0.15	3.01	ELXM181VSN152MA40S
	1,800	35× 45	0.15	3.41	ELXM181VSN182MA45S
	2,200	35× 50	0.15	3.87	ELXM181VSN222MA50S
200	220	22× 25	0.15	0.90	ELXM201VSN221MP25S
	270	22× 30	0.15	1.05	ELXM201VSN271MP30S
	330	22× 30	0.15	1.16	ELXM201VSN331MP30S
	330	25.4× 25	0.15	1.16	ELXM201VSN331MQ25S
	390	22× 35	0.15	1.29	ELXM201VSN391MP35S
	390	25.4× 30	0.15	1.29	ELXM201VSN391MQ30S
	470	22× 40	0.15	1.46	ELXM201VSN471MP40S
	470	25.4× 30	0.15	1.42	ELXM201VSN471MQ30S
	470	30× 25	0.15	1.45	ELXM201VSN471MR25S
	560	22× 45	0.15	1.63	ELXM201VSN561MP45S
	560	25.4× 35	0.15	1.62	ELXM201VSN561MQ35S
	560	30× 30	0.15	1.62	ELXM201VSN561MR30S
	680	25.4× 40	0.15	1.83	ELXM201VSN681MQ40S
	680	30× 30	0.15	1.79	ELXM201VSN681MR30S
	820	25.4× 45	0.15	2.06	ELXM201VSN821MQ45S
	820	30× 35	0.15	2.04	ELXM201VSN821MR35S
	1,000	30× 45	0.15	2.42	ELXM201VSN102MR45S
	1,000	35× 30	0.15	2.30	ELXM201VSN102MA30S
	1,200	30× 50	0.15	2.71	ELXM201VSN122MR50S
	1,200	35× 40	0.15	2.70	ELXM201VSN122MA40S
	1,500	35× 45	0.15	3.11	ELXM201VSN152MA45S
	1,800	35× 50	0.15	3.50	ELXM201VSN182MA50S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
220	220	22×25	0.15	0.90	ELXM221VSN221MP25S
	270	22×30	0.15	1.05	ELXM221VSN271MP30S
	330	22×35	0.15	1.19	ELXM221VSN331MP35S
	330	25.4×25	0.15	1.16	ELXM221VSN331MQ25S
	390	22×40	0.15	1.33	ELXM221VSN391MP40S
	390	25.4×30	0.15	1.29	ELXM221VSN391MQ30S
	470	22×45	0.15	1.49	ELXM221VSN471MP45S
	470	25.4×35	0.15	1.48	ELXM221VSN471MQ35S
	470	30×25	0.15	1.45	ELXM221VSN471MR25S
	560	22×50	0.15	1.63	ELXM221VSN561MP50S
	560	25.4×40	0.15	1.71	ELXM221VSN561MQ40S
	560	30×30	0.15	1.62	ELXM221VSN561MR30S
	680	25.4×45	0.15	1.87	ELXM221VSN681MQ45S
	680	30×35	0.15	1.86	ELXM221VSN681MR35S
	820	25.4×50	0.15	2.10	ELXM221VSN821MQ50S
	820	30×40	0.15	2.12	ELXM221VSN821MR40S
	820	35×30	0.15	2.08	ELXM221VSN821MA30S
	1,000	30×50	0.15	2.48	ELXM221VSN102MR50S
	1,000	35×40	0.15	2.46	ELXM221VSN102MA40S
	1,200	35×45	0.15	2.78	ELXM221VSN122MA45S
	1,500	35×50	0.15	3.20	ELXM221VSN152MA50S
250	180	22×25	0.15	0.82	ELXM251VSN181MP25S
	220	22×30	0.15	0.95	ELXM251VSN221MP30S
	270	22×35	0.15	1.08	ELXM251VSN271MP35S
	270	25.4×25	0.15	1.05	ELXM251VSN271MQ25S
	330	22×40	0.15	1.22	ELXM251VSN331MP40S
	330	25.4×30	0.15	1.19	ELXM251VSN331MQ30S
	390	22×45	0.15	1.36	ELXM251VSN391MP45S
	390	25.4×35	0.15	1.35	ELXM251VSN391MQ35S
	390	30×25	0.15	1.32	ELXM251VSN391MR25S
	470	22×50	0.15	1.49	ELXM251VSN471MP50S
	470	25.4×40	0.15	1.52	ELXM251VSN471MQ40S
	470	30×30	0.15	1.49	ELXM251VSN471MR30S
	560	25.4×45	0.15	1.70	ELXM251VSN561MQ45S
	560	30×35	0.15	1.69	ELXM251VSN561MR35S
	680	25.4×50	0.15	1.91	ELXM251VSN681MQ50S
	680	30×40	0.15	1.93	ELXM251VSN681MR40S
	680	35×30	0.15	1.90	ELXM251VSN681MA30S
	820	30×45	0.15	2.19	ELXM251VSN821MR45S
	820	35×35	0.15	2.13	ELXM251VSN821MA35S
	1,000	35×40	0.15	2.46	ELXM251VSN102MA40S
	1,200	35×50	0.15	2.86	ELXM251VSN122MA50S
315	100	22×25	0.15	0.67	ELXM3B1VSN101MP25S
	120	22×30	0.15	0.77	ELXM3B1VSN121MP30S
	150	22×30	0.15	0.86	ELXM3B1VSN151MP30S
	150	25.4×25	0.15	0.85	ELXM3B1VSN151MQ25S
	180	22×35	0.15	0.96	ELXM3B1VSN181MP35S
	180	25.4×30	0.15	0.96	ELXM3B1VSN181MQ30S
	220	22×40	0.15	1.09	ELXM3B1VSN221MP40S
	220	25.4×30	0.15	1.06	ELXM3B1VSN221MQ30S
	220	30×25	0.15	1.08	ELXM3B1VSN221MR25S
	270	22×45	0.15	1.24	ELXM3B1VSN271MP45S
	270	25.4×35	0.15	1.23	ELXM3B1VSN271MQ35S
	270	30×30	0.15	1.23	ELXM3B1VSN271MR30S
	330	25.4×40	0.15	1.40	ELXM3B1VSN331MQ40S
	330	30×35	0.15	1.42	ELXM3B1VSN331MR35S
	330	35×30	0.15	1.45	ELXM3B1VSN331MA30S
	390	25.4×50	0.15	1.59	ELXM3B1VSN391MQ50S
	390	30×35	0.15	1.54	ELXM3B1VSN391MR35S
	390	35×30	0.15	1.57	ELXM3B1VSN391MA30S
	470	30×45	0.15	1.81	ELXM3B1VSN471MR45S
	470	35×35	0.15	1.77	ELXM3B1VSN471MA35S
	560	30×50	0.15	2.03	ELXM3B1VSN561MR50S
	560	35×40	0.15	2.02	ELXM3B1VSN561MA40S
	680	35×45	0.15	2.29	ELXM3B1VSN681MA45S
	820	35×50	0.15	2.59	ELXM3B1VSN821MA50S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXM Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
350	100	22×25	0.15	0.67	ELXM351VSN101MP25S
	120	22×30	0.15	0.77	ELXM351VSN121MP30S
	120	25.4×25	0.15	0.76	ELXM351VSN121MQ25S
	150	22×35	0.15	0.88	ELXM351VSN151MP35S
	150	25.4×30	0.15	0.88	ELXM351VSN151MQ30S
	180	22×40	0.15	0.99	ELXM351VSN181MP40S
	180	25.4×30	0.15	0.96	ELXM351VSN181MQ30S
	180	30×25	0.15	0.98	ELXM351VSN181MR25S
	220	22×45	0.15	1.12	ELXM351VSN221MP45S
	220	25.4×35	0.15	1.11	ELXM351VSN221MQ35S
	220	30×30	0.15	1.11	ELXM351VSN221MR30S
	270	25.4×40	0.15	1.26	ELXM351VSN271MQ40S
	270	30×35	0.15	1.28	ELXM351VSN271MR35S
	330	25.4×45	0.15	1.40	ELXM351VSN331MQ45S
	330	30×35	0.15	1.42	ELXM351VSN331MR35S
	330	35×30	0.15	1.45	ELXM351VSN331MA30S
	390	30×40	0.15	1.60	ELXM351VSN391MR40S
	390	35×35	0.15	1.61	ELXM351VSN391MA35S
	470	30×50	0.15	1.86	ELXM351VSN471MR50S
	470	35×40	0.15	1.85	ELXM351VSN471MA40S
	560	35×40	0.15	2.02	ELXM351VSN561MA40S
	680	35×50	0.15	2.36	ELXM351VSN681MA50S
400	68	22×25	0.15	0.55	ELXM401VSN680MP25S
	82	22×30	0.15	0.63	ELXM401VSN820MP30S
	100	22×30	0.15	0.70	ELXM401VSN101MP30S
	100	25.4×25	0.15	0.70	ELXM401VSN101MQ25S
	120	22×35	0.15	0.79	ELXM401VSN121MP35S
	120	25.4×30	0.15	0.79	ELXM401VSN121MQ30S
	150	22×40	0.15	0.90	ELXM401VSN151MP40S
	150	25.4×30	0.15	0.88	ELXM401VSN151MQ30S
	150	30×25	0.15	0.90	ELXM401VSN151MR25S
	180	22×45	0.15	0.99	ELXM401VSN181MP45S
	180	25.4×35	0.15	1.01	ELXM401VSN181MQ35S
	180	30×30	0.15	1.01	ELXM401VSN181MR30S
	220	25.4×40	0.15	1.14	ELXM401VSN221MQ40S
	220	30×35	0.15	1.16	ELXM401VSN221MR35S
	270	25.4×50	0.15	1.32	ELXM401VSN271MQ50S
	270	30×40	0.15	1.33	ELXM401VSN271MR40S
	270	35×30	0.15	1.31	ELXM401VSN271MA30S
	330	30×45	0.15	1.52	ELXM401VSN331MR45S
	330	35×35	0.15	1.48	ELXM401VSN331MA35S
	390	30×50	0.15	1.69	ELXM401VSN391MR50S
	390	35×40	0.15	1.68	ELXM401VSN391MA40S
	470	35×45	0.15	1.91	ELXM401VSN471MA45S
	560	35×50	0.15	2.14	ELXM401VSN561MA50S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
420	56	22×25	0.20	0.50	ELXM421VSN560MP25S
	68	22×30	0.20	0.58	ELXM421VSN680MP30S
	82	22×30	0.20	0.63	ELXM421VSN820MP30S
	82	25.4×25	0.20	0.63	ELXM421VSN820MQ25S
	100	22×35	0.20	0.72	ELXM421VSN101MP35S
	100	25.4×30	0.20	0.72	ELXM421VSN101MQ30S
	120	22×40	0.20	0.81	ELXM421VSN121MP40S
	120	25.4×30	0.20	0.79	ELXM421VSN121MQ30S
	120	30×25	0.20	0.80	ELXM421VSN121MR25S
	150	22×45	0.20	0.92	ELXM421VSN151MP45S
	150	25.4×35	0.20	0.92	ELXM421VSN151MQ35S
	150	30×30	0.20	0.92	ELXM421VSN151MR30S
	180	25.4×40	0.20	1.03	ELXM421VSN181MQ40S
	180	30×35	0.20	1.05	ELXM421VSN181MR35S
	220	25.4×50	0.20	1.19	ELXM421VSN221MQ50S
	220	30×35	0.20	1.16	ELXM421VSN221MR35S
	220	35×30	0.20	1.18	ELXM421VSN221MA30S
	270	30×45	0.20	1.38	ELXM421VSN271MR45S
	270	35×35	0.20	1.34	ELXM421VSN271MA35S
	330	30×50	0.20	1.56	ELXM421VSN331MR50S
	330	35×40	0.20	1.55	ELXM421VSN331MA40S
	390	35×45	0.20	1.74	ELXM421VSN391MA45S
	470	35×50	0.20	1.96	ELXM421VSN471MA50S
450	47	22×25	0.20	0.46	ELXM451VSN470MP25S
	56	22×30	0.20	0.52	ELXM451VSN560MP30S
	68	22×30	0.20	0.58	ELXM451VSN680MP30S
	68	25.4×25	0.20	0.58	ELXM451VSN680MQ25S
	82	22×35	0.20	0.65	ELXM451VSN820MP35S
	82	25.4×30	0.20	0.65	ELXM451VSN820MQ30S
	100	22×40	0.20	0.74	ELXM451VSN101MP40S
	100	25.4×30	0.20	0.72	ELXM451VSN101MQ30S
	100	30×25	0.20	0.73	ELXM451VSN101MR25S
	120	22×45	0.20	0.83	ELXM451VSN121MP45S
	120	25.4×35	0.20	0.82	ELXM451VSN121MQ35S
	120	30×30	0.20	0.82	ELXM451VSN121MR30S
	150	25.4×40	0.20	0.94	ELXM451VSN151MQ40S
	150	30×35	0.20	0.96	ELXM451VSN151MR35S
	180	25.4×45	0.20	1.06	ELXM451VSN181MQ45S
	180	30×35	0.20	1.05	ELXM451VSN181MR35S
	180	35×30	0.20	1.07	ELXM451VSN181MA30S
	220	30×40	0.20	1.20	ELXM451VSN221MR40S
	220	35×35	0.20	1.21	ELXM451VSN221MA35S
	270	30×50	0.20	1.41	ELXM451VSN271MR50S
	270	35×40	0.20	1.40	ELXM451VSN271MA40S
	330	35×45	0.20	1.60	ELXM451VSN331MA45S
	390	35×50	0.20	1.79	ELXM451VSN391MA50S

◆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
315 to 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

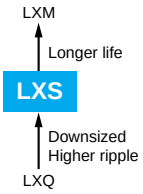
NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXS Series

- ●Endurance with ripple current : 5,000 hours at 105℃
- ●Downsized from LXQ series
- ●Non solvent resistant type
- ●**RoHS Compliant**

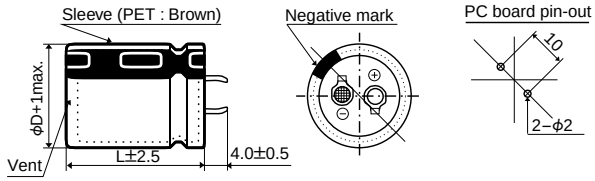


◆SPECIFICATIONS

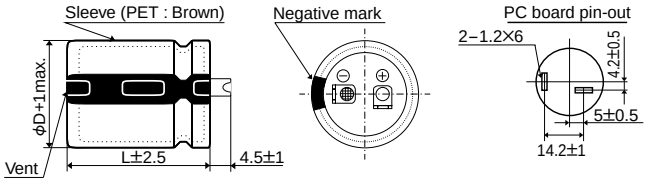
Items	Characteristics			
Category Temperature Range	−25 to +105℃			
Rated Voltage Range	160 to 450Vdc			
Capacitance Tolerance	±20% (M)			(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)			(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 400V	420 & 450V	
	tanδ (Max.)	0.15	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 400V	420 & 450V	
	Z(−25℃)/Z(+20℃)	4	8	(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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.			
	Capacitance change	≦±15% of the initial value		
	D.F. (tanδ)	≦150% of the initial specified value		
	Leakage current	≦The initial specified value		

◆DIMENSIONS [mm]

●Terminal Code : VS (φ22 to φ35) : Standard

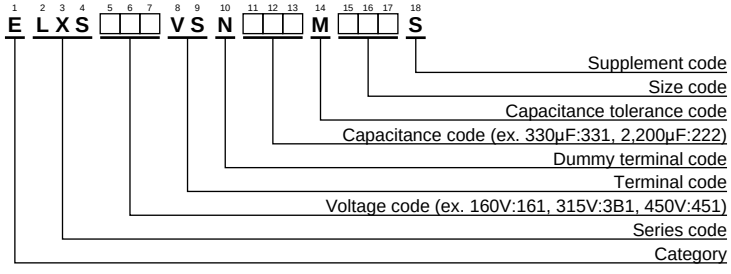


●Terminal Code : LI (φ30, φ35)



The standard design has no plastic disc.

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXS Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
160	470	22×25	0.15	1.47	ELXS161VSN471MP25S
	680	22×30	0.15	1.86	ELXS161VSN681MP30S
	680	25.4×25	0.15	1.84	ELXS161VSN681MQ25S
	820	22×35	0.15	2.09	ELXS161VSN821MP35S
	820	25.4×30	0.15	2.08	ELXS161VSN821MQ30S
	1,000	22×40	0.15	2.35	ELXS161VSN102MP40S
	1,000	22×45	0.15	2.40	ELXS161VSN102MP45S
	1,000	25.4×35	0.15	2.40	ELXS161VSN102MQ35S
	1,000	30×25	0.15	2.50	ELXS161VSN102MR25S
	1,200	22×50	0.15	2.69	ELXS161VSN122MP50S
	1,200	25.4×40	0.15	2.68	ELXS161VSN122MQ40S
	1,200	30×30	0.15	2.77	ELXS161VSN122MR30S
	1,200	35×25	0.15	2.91	ELXS161VSN122MA25S
	1,500	25.4×45	0.15	3.05	ELXS161VSN152MQ45S
	1,500	30×35	0.15	3.17	ELXS161VSN152MR35S
	1,800	25.4×50	0.15	3.40	ELXS161VSN182MQ50S
	1,800	30×40	0.15	3.57	ELXS161VSN182MR40S
	1,800	35×30	0.15	3.62	ELXS161VSN182MA30S
	2,200	30×45	0.15	4.05	ELXS161VSN222MR45S
	2,200	30×50	0.15	4.11	ELXS161VSN222MR50S
	2,200	35×35	0.15	4.07	ELXS161VSN222MA35S
	2,700	35×40	0.15	4.67	ELXS161VSN272MA40S
	2,700	35×45	0.15	4.78	ELXS161VSN272MA45S
	3,300	35×50	0.15	5.40	ELXS161VSN332MA50S
180	390	22×25	0.15	1.34	ELXS181VSN391MP25S
	560	22×30	0.15	1.68	ELXS181VSN561MP30S
	560	25.4×25	0.15	1.67	ELXS181VSN561MQ25S
	680	22×35	0.15	1.90	ELXS181VSN681MP35S
	820	22×40	0.15	2.13	ELXS181VSN821MP40S
	820	25.4×30	0.15	2.08	ELXS181VSN821MQ30S
	820	25.4×35	0.15	2.17	ELXS181VSN821MQ35S
	820	30×25	0.15	2.26	ELXS181VSN821MR25S
	1,000	22×45	0.15	2.40	ELXS181VSN102MP45S
	1,000	22×50	0.15	2.45	ELXS181VSN102MP50S
	1,000	25.4×40	0.15	2.45	ELXS181VSN102MQ40S
	1,000	30×30	0.15	2.52	ELXS181VSN102MR30S
	1,000	35×25	0.15	2.66	ELXS181VSN102MA25S
	1,200	25.4×45	0.15	2.73	ELXS181VSN122MQ45S
	1,200	30×35	0.15	2.83	ELXS181VSN122MR35S
	1,500	25.4×50	0.15	3.10	ELXS181VSN152MQ50S
	1,500	30×40	0.15	3.26	ELXS181VSN152MR40S
	1,500	35×30	0.15	3.31	ELXS181VSN152MA30S
	1,800	30×45	0.15	3.66	ELXS181VSN182MR45S
	1,800	35×35	0.15	3.68	ELXS181VSN182MA35S
	2,200	30×50	0.15	4.11	ELXS181VSN222MR50S
	2,200	35×40	0.15	4.22	ELXS181VSN222MA40S
	2,200	35×45	0.15	4.32	ELXS181VSN222MA45S
	2,700	35×50	0.15	4.88	ELXS181VSN272MA50S
200	390	22×25	0.15	1.34	ELXS201VSN391MP25S
	470	22×30	0.15	1.54	ELXS201VSN471MP30S
	560	22×35	0.15	1.72	ELXS201VSN561MP35S
	560	25.4×25	0.15	1.67	ELXS201VSN561MQ25S
	680	22×40	0.15	1.94	ELXS201VSN681MP40S
	680	25.4×30	0.15	1.89	ELXS201VSN681MQ30S
	680	30×25	0.15	2.06	ELXS201VSN681MR25S
	820	22×45	0.15	2.17	ELXS201VSN821MP45S
	820	25.4×35	0.15	2.17	ELXS201VSN821MQ35S
	1,000	22×50	0.15	2.45	ELXS201VSN102MP50S
	1,000	25.4×40	0.15	2.45	ELXS201VSN102MQ40S
	1,000	30×30	0.15	2.52	ELXS201VSN102MR30S
	1,000	35×25	0.15	2.66	ELXS201VSN102MA25S
	1,200	25.4×45	0.15	2.73	ELXS201VSN122MQ45S
	1,200	25.4×50	0.15	2.78	ELXS201VSN122MQ50S
	1,200	30×35	0.15	2.83	ELXS201VSN122MR35S
	1,200	35×30	0.15	2.96	ELXS201VSN122MA30S
	1,500	30×40	0.15	3.26	ELXS201VSN152MR40S
	1,500	30×45	0.15	3.34	ELXS201VSN152MR45S
200	1,500	35×35	0.15	3.36	ELXS201VSN152MA35S
	1,800	30×50	0.15	3.72	ELXS201VSN182MR50S
	1,800	35×40	0.15	3.81	ELXS201VSN182MA40S
	2,200	35×45	0.15	4.32	ELXS201VSN222MA45S
	2,700	35×50	0.15	4.88	ELXS201VSN272MA50S
250	270	22×25	0.15	1.11	ELXS251VSN271MP25S
	330	22×30	0.15	1.29	ELXS251VSN331MP30S
	390	22×35	0.15	1.44	ELXS251VSN391MP35S
	390	25.4×25	0.15	1.40	ELXS251VSN391MQ25S
	470	22×40	0.15	1.61	ELXS251VSN471MP40S
	470	25.4×30	0.15	1.57	ELXS251VSN471MQ30S
	560	22×45	0.15	1.79	ELXS251VSN561MP45S
	560	25.4×35	0.15	1.79	ELXS251VSN561MQ35S
	560	30×25	0.15	1.87	ELXS251VSN561MR25S
	680	22×50	0.15	2.02	ELXS251VSN681MP50S
	680	25.4×40	0.15	2.02	ELXS251VSN681MQ40S
	680	30×30	0.15	2.08	ELXS251VSN681MR30S
	680	35×25	0.15	2.19	ELXS251VSN681MA25S
	820	25.4×45	0.15	2.26	ELXS251VSN821MQ45S
	820	25.4×50	0.15	2.29	ELXS251VSN821MQ50S
	820	30×35	0.15	2.34	ELXS251VSN821MR35S
	820	35×30	0.15	2.45	ELXS251VSN821MA30S
	1,000	30×40	0.15	2.66	ELXS251VSN102MR40S
	1,200	30×45	0.15	2.99	ELXS251VSN122MR45S
	1,200	30×50	0.15	3.04	ELXS251VSN122MR50S
	1,200	35×35	0.15	3.00	ELXS251VSN122MA35S
	1,200	35×40	0.15	3.11	ELXS251VSN122MA40S
	1,500	35×45	0.15	3.56	ELXS251VSN152MA45S
	1,800	35×50	0.15	3.98	ELXS251VSN182MA50S
315	180	22×25	0.15	0.95	ELXS3B1VSN181MP25S
	220	22×30	0.15	1.10	ELXS3B1VSN221MP30S
	220	25.4×25	0.15	1.10	ELXS3B1VSN221MQ25S
	270	22×35	0.15	1.24	ELXS3B1VSN271MP35S
	270	25.4×30	0.15	1.25	ELXS3B1VSN271MQ30S
	330	22×40	0.15	1.40	ELXS3B1VSN331MP40S
	330	30×25	0.15	1.43	ELXS3B1VSN331MR25S
	390	22×45	0.15	1.56	ELXS3B1VSN391MP45S
	390	22×50	0.15	1.59	ELXS3B1VSN391MP50S
	390	25.4×35	0.15	1.57	ELXS3B1VSN391MQ35S
	470	25.4×40	0.15	1.76	ELXS3B1VSN471MQ40S
	470	25.4×45	0.15	1.79	ELXS3B1VSN471MQ45S
	470	30×30	0.15	1.73	ELXS3B1VSN471MR30S
	470	35×25	0.15	1.82	ELXS3B1VSN471MA25S
	560	25.4×50	0.15	1.99	ELXS3B1VSN561MQ50S
	560	30×35	0.15	1.93	ELXS3B1VSN561MR35S
	560	35×30	0.15	2.02	ELXS3B1VSN561MA30S
	680	30×40	0.15	2.19	ELXS3B1VSN681MR40S
	680	30×45	0.15	2.25	ELXS3B1VSN681MR45S
	680	35×35	0.15	2.26	ELXS3B1VSN681MA35S
	820	30×50	0.15	2.51	ELXS3B1VSN821MR50S
	820	35×40	0.15	2.57	ELXS3B1VSN821MA40S
	1,000	35×45	0.15	2.91	ELXS3B1VSN102MA45S
	1,200	35×50	0.15	3.25	ELXS3B1VSN122MA50S
400	120	22×25	0.15	0.77	ELXS401VSN121MP25S
	150	22×30	0.15	0.90	ELXS401VSN151MP30S
	180	22×35	0.15	1.02	ELXS401VSN181MP35S
	180	25.4×25	0.15	0.99	ELXS401VSN181MQ25S
	220	22×40	0.15	1.15	ELXS401VSN221MP40S
	220	25.4×30	0.15	1.13	ELXS401VSN221MQ30S
	220	30×25	0.15	1.17	ELXS401VSN221MR25S
	270	22×45	0.15	1.29	ELXS401VSN271MP45S
	270	22×50	0.15	1.32	ELXS401VSN271MP50S
	270	25.4×35	0.15	1.30	ELXS401VSN271MQ35S
	330	25.4×40	0.15	1.47	ELXS401VSN331MQ40S
	330	30×30	0.15	1.45	ELXS401VSN331MR30S
	330	35×25	0.15	1.52	ELXS401VSN331MA25S
	390	25.4×45	0.15	1.63	ELXS401VSN391MQ45S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXS Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
400	390	25.4×50	0.15	1.66	ELXS401VSN391MQ50S
	390	30×35	0.15	1.61	ELXS401VSN391MR35S
	390	35×30	0.15	1.68	ELXS401VSN391MA30S
	470	30×40	0.15	1.82	ELXS401VSN471MR40S
	470	35×35	0.15	1.88	ELXS401VSN471MA35S
	560	30×45	0.15	2.04	ELXS401VSN561MR45S
	560	30×50	0.15	2.07	ELXS401VSN561MR50S
	560	35×40	0.15	2.13	ELXS401VSN561MA40S
	680	35×45	0.15	2.40	ELXS401VSN681MA45S
	820	35×50	0.15	2.69	ELXS401VSN821MA50S
420	100	22×25	0.20	0.70	ELXS421VSN101MP25S
	120	22×30	0.20	0.81	ELXS421VSN121MP30S
	120	25.4×25	0.20	0.81	ELXS421VSN121MQ25S
	150	22×35	0.20	0.93	ELXS421VSN151MP35S
	180	22×40	0.20	1.04	ELXS421VSN181MP40S
	180	25.4×30	0.20	1.02	ELXS421VSN181MQ30S
	180	30×25	0.20	1.06	ELXS421VSN181MR25S
	220	22×45	0.20	1.17	ELXS421VSN221MP45S
	220	22×50	0.20	1.20	ELXS421VSN221MP50S
	220	25.4×35	0.20	1.18	ELXS421VSN221MQ35S
	270	25.4×40	0.20	1.33	ELXS421VSN271MQ40S
	270	25.4×45	0.20	1.36	ELXS421VSN271MQ45S
	270	30×30	0.20	1.31	ELXS421VSN271MR30S
	270	35×25	0.20	1.38	ELXS421VSN271MA25S
	330	25.4×50	0.20	1.52	ELXS421VSN331MQ50S
	330	30×35	0.20	1.48	ELXS421VSN331MR35S
	330	35×30	0.20	1.55	ELXS421VSN331MA30S
	390	30×40	0.20	1.66	ELXS421VSN391MR40S
	390	30×45	0.20	1.70	ELXS421VSN391MR45S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
420	390	35×35	0.20	1.71	ELXS421VSN391MA35S
	470	30×50	0.20	1.90	ELXS421VSN471MR50S
	470	35×40	0.20	1.95	ELXS421VSN471MA40S
	560	35×45	0.20	2.17	ELXS421VSN561MA45S
	680	35×50	0.20	2.45	ELXS421VSN681MA50S
450	82	22×25	0.20	0.64	ELXS451VSN820MP25S
	120	22×30	0.20	0.81	ELXS451VSN121MP30S
	120	22×35	0.20	0.83	ELXS451VSN121MP35S
	120	25.4×25	0.20	0.81	ELXS451VSN121MQ25S
	150	22×40	0.20	0.94	ELXS451VSN151MP40S
	150	25.4×30	0.20	0.93	ELXS451VSN151MQ30S
	180	22×45	0.20	1.06	ELXS451VSN181MP45S
	180	25.4×35	0.20	1.06	ELXS451VSN181MQ35S
	180	30×25	0.20	1.06	ELXS451VSN181MR25S
	220	22×50	0.20	1.20	ELXS451VSN221MP50S
	220	25.4×40	0.20	1.20	ELXS451VSN221MQ40S
	220	30×30	0.20	1.18	ELXS451VSN221MR30S
	220	35×25	0.20	1.24	ELXS451VSN221MA25S
	270	25.4×45	0.20	1.36	ELXS451VSN271MQ45S
	270	25.4×50	0.20	1.38	ELXS451VSN271MQ50S
	270	30×35	0.20	1.34	ELXS451VSN271MR35S
	270	35×30	0.20	1.40	ELXS451VSN271MA30S
	330	30×40	0.20	1.52	ELXS451VSN331MR40S
	390	30×45	0.20	1.70	ELXS451VSN391MR45S
	390	30×50	0.20	1.73	ELXS451VSN391MR50S
	390	35×35	0.20	1.71	ELXS451VSN391MA35S
	470	35×40	0.20	1.95	ELXS451VSN471MA40S
	470	35×45	0.20	1.99	ELXS451VSN471MA45S
	560	35×50	0.20	2.22	ELXS451VSN561MA50S

◆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
315 to 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

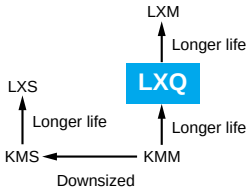
NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXQ Series

- ●Endurance with ripple current : 5,000 hours at 105℃
- ●Downsized and higher ripple version of LXG series
- ●Non solvent resistant type
- ●**RoHS Compliant**

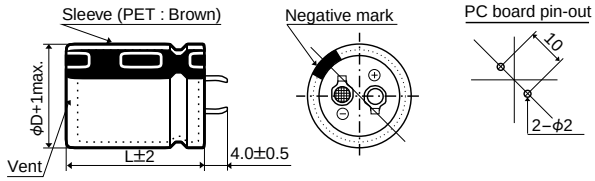


◆SPECIFICATIONS

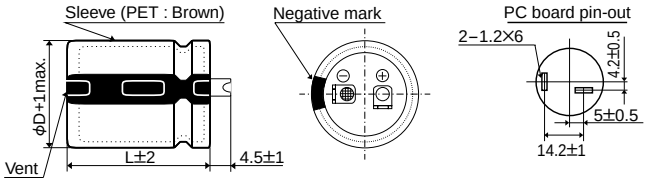
Items	Characteristics		
Category Temperature Range	−25 to +105℃		
Rated Voltage Range	160 to 450Vdc		
Capacitance Tolerance	±20% (M)		(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)		(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)	160 to 400V	420 & 450V
	tanδ (Max.)	0.15	0.20
			(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 400V	420 & 450V
	Z(−25℃)/Z(+20℃)	4	8
			(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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.		
	Capacitance change	≦±15% of the initial value	
	D.F. (tanδ)	≦150% of the initial specified value	
	Leakage current	≦The initial specified value	

◆DIMENSIONS [mm]

●Terminal Code : VS (φ22 to φ35) : Standard

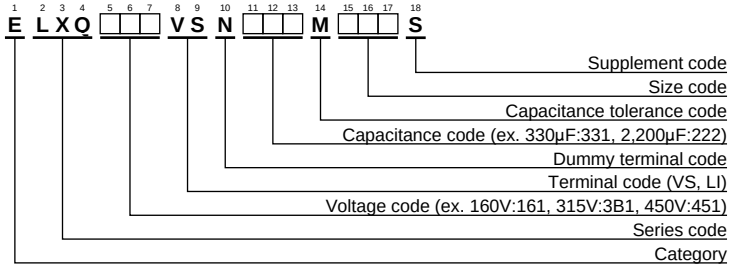


●Terminal Code : LI (φ30, φ35)



The standard design has no plastic disc.

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXQ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
160	390	22×25	0.15	1.32	ELXQ161VSN391MP25S
	560	22×30	0.15	1.66	ELXQ161VSN561MP30S
	560	25.4×25	0.15	1.68	ELXQ161VSN561MQ25S
	680	22×35	0.15	1.87	ELXQ161VSN681MP35S
	680	25.4×30	0.15	1.88	ELXQ161VSN681MQ30S
	680	30×25	0.15	1.96	ELXQ161VSN681MR25S
	820	22×40	0.15	2.09	ELXQ161VSN821MP40S
	1,000	22×45	0.15	2.36	ELXQ161VSN102MP45S
	1,000	22×50	0.15	2.41	ELXQ161VSN102MP50S
	1,000	25.4×35	0.15	2.38	ELXQ161VSN102MQ35S
	1,000	30×30	0.15	2.40	ELXQ161VSN102MR30S
	1,000	35×25	0.15	2.55	ELXQ161VSN102MA25S
	1,200	25.4×40	0.15	2.66	ELXQ161VSN122MQ40S
	1,200	25.4×45	0.15	2.71	ELXQ161VSN122MQ45S
	1,200	30×35	0.15	2.69	ELXQ161VSN122MR35S
	1,200	30×40	0.15	2.77	ELXQ161VSN122MR40S
	1,200	35×30	0.15	2.86	ELXQ161VSN122MA30S
	1,500	25.4×50	0.15	3.08	ELXQ161VSN152MQ50S
	1,500	30×45	0.15	3.17	ELXQ161VSN152MR45S
	1,500	35×35	0.15	3.22	ELXQ161VSN152MA35S
	1,800	30×50	0.15	3.53	ELXQ161VSN182MR50S
	1,800	35×40	0.15	3.66	ELXQ161VSN182MA40S
	2,200	35×45	0.15	4.14	ELXQ161VSN222MA45S
	2,700	35×50	0.15	4.68	ELXQ161VSN272MA50S
180	330	22×25	0.15	1.21	ELXQ181VSN331MP25S
	470	22×30	0.15	1.52	ELXQ181VSN471MP30S
	470	25.4×25	0.15	1.52	ELXQ181VSN471MQ25S
	560	22×35	0.15	1.70	ELXQ181VSN561MP35S
	560	30×25	0.15	1.78	ELXQ181VSN561MR25S
	680	22×40	0.15	1.91	ELXQ181VSN681MP40S
	680	25.4×30	0.15	1.88	ELXQ181VSN681MQ30S
	820	22×45	0.15	1.99	ELXQ181VSN821MP45S
	820	25.4×35	0.15	2.16	ELXQ181VSN821MQ35S
	820	30×30	0.15	2.17	ELXQ181VSN821MR30S
	820	35×25	0.15	2.31	ELXQ181VSN821MA25S
	1,000	22×50	0.15	2.25	ELXQ181VSN102MP50S
	1,000	25.4×40	0.15	2.43	ELXQ181VSN102MQ40S
	1,000	25.4×45	0.15	2.47	ELXQ181VSN102MQ45S
	1,000	30×35	0.15	2.46	ELXQ181VSN102MR35S
	1,200	25.4×50	0.15	2.75	ELXQ181VSN122MQ50S
	1,200	30×40	0.15	2.77	ELXQ181VSN122MR40S
	1,200	35×30	0.15	2.86	ELXQ181VSN122MA30S
	1,500	30×45	0.15	3.17	ELXQ181VSN152MR45S
	1,500	30×50	0.15	3.22	ELXQ181VSN152MR50S
	1,500	35×35	0.15	3.22	ELXQ181VSN152MA35S
	1,800	35×40	0.15	3.66	ELXQ181VSN182MA40S
	1,800	35×45	0.15	3.74	ELXQ181VSN182MA45S
	2,200	35×50	0.15	4.22	ELXQ181VSN222MA50S
200	270	22×25	0.15	1.10	ELXQ201VSN271MP25S
	390	22×30	0.15	1.38	ELXQ201VSN391MP30S
	390	25.4×25	0.15	1.39	ELXQ201VSN391MQ25S
	470	22×35	0.15	1.55	ELXQ201VSN471MP35S
	560	22×40	0.15	1.73	ELXQ201VSN561MP40S
	560	25.4×30	0.15	1.71	ELXQ201VSN561MQ30S
	560	30×25	0.15	1.78	ELXQ201VSN561MR25S
	680	22×45	0.15	1.81	ELXQ201VSN681MP45S
	680	25.4×35	0.15	1.87	ELXQ201VSN681MQ35S
	680	30×30	0.15	1.98	ELXQ201VSN681MR30S
	680	35×25	0.15	2.10	ELXQ201VSN681MA25S
	820	22×50	0.15	2.18	ELXQ201VSN821MP50S
	820	25.4×40	0.15	2.09	ELXQ201VSN821MQ40S
	820	30×35	0.15	2.22	ELXQ201VSN821MR35S
	1,000	25.4×45	0.15	2.35	ELXQ201VSN102MQ45S
	1,000	25.4×50	0.15	2.39	ELXQ201VSN102MQ50S
	1,000	30×40	0.15	2.53	ELXQ201VSN102MR40S
	1,000	35×30	0.15	2.61	ELXQ201VSN102MA30S
	1,200	30×45	0.15	2.84	ELXQ201VSN122MR45S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
200	1,200	30×50	0.15	2.88	ELXQ201VSN122MR50S
	1,200	35×35	0.15	2.88	ELXQ201VSN122MA35S
	1,500	35×40	0.15	3.34	ELXQ201VSN152MA40S
	1,800	35×45	0.15	3.74	ELXQ201VSN182MA45S
	1,800	35×50	0.15	3.82	ELXQ201VSN182MA50S
220	270	22×25	0.15	1.10	ELXQ221VSN271MP25S
	330	22×30	0.15	1.19	ELXQ221VSN331MP30S
	390	25.4×25	0.15	1.39	ELXQ221VSN391MQ25S
	470	22×35	0.15	1.55	ELXQ221VSN471MP35S
	470	25.4×30	0.15	1.56	ELXQ221VSN471MQ30S
	470	30×25	0.15	1.63	ELXQ221VSN471MR25S
	560	22×40	0.15	1.73	ELXQ221VSN561MP40S
	560	30×30	0.15	1.79	ELXQ221VSN561MR30S
	680	22×45	0.15	1.94	ELXQ221VSN681MP45S
	680	22×50	0.15	1.99	ELXQ221VSN681MP50S
	680	25.4×35	0.15	1.96	ELXQ221VSN681MQ35S
	680	30×35	0.15	2.02	ELXQ221VSN681MR35S
	680	35×25	0.15	2.10	ELXQ221VSN681MA25S
	820	25.4×40	0.15	2.20	ELXQ221VSN821MQ40S
	820	25.4×45	0.15	2.24	ELXQ221VSN821MQ45S
	820	30×40	0.15	2.29	ELXQ221VSN821MR40S
	820	35×30	0.15	2.36	ELXQ221VSN821MA30S
	1,000	25.4×50	0.15	2.51	ELXQ221VSN102MQ50S
	1,000	30×45	0.15	2.59	ELXQ221VSN102MR45S
	1,000	35×35	0.15	2.63	ELXQ221VSN102MA35S
	1,200	30×50	0.15	2.88	ELXQ221VSN122MR50S
	1,200	35×40	0.15	2.98	ELXQ221VSN122MA40S
	1,500	35×45	0.15	3.41	ELXQ221VSN152MA45S
	1,800	35×50	0.15	3.82	ELXQ221VSN182MA50S
250	220	22×25	0.15	1.01	ELXQ251VSN221MP25S
	270	22×30	0.15	1.20	ELXQ251VSN271MP30S
	330	25.4×25	0.15	1.32	ELXQ251VSN331MQ25S
	390	22×35	0.15	1.44	ELXQ251VSN391MP35S
	390	25.4×30	0.15	1.43	ELXQ251VSN391MQ30S
	390	30×25	0.15	1.51	ELXQ251VSN391MR25S
	470	22×40	0.15	1.62	ELXQ251VSN471MP40S
	560	22×45	0.15	1.80	ELXQ251VSN561MP45S
	560	22×50	0.15	1.84	ELXQ251VSN561MP50S
	560	25.4×35	0.15	1.78	ELXQ251VSN561MQ35S
	560	30×30	0.15	1.83	ELXQ251VSN561MR30S
	560	35×25	0.15	1.91	ELXQ251VSN561MA25S
	680	25.4×40	0.15	2.00	ELXQ251VSN681MQ40S
	680	25.4×45	0.15	2.04	ELXQ251VSN681MQ45S
	680	30×35	0.15	2.06	ELXQ251VSN681MR35S
	680	35×30	0.15	2.15	ELXQ251VSN681MA30S
	820	25.4×50	0.15	2.28	ELXQ251VSN821MQ50S
	820	30×40	0.15	2.33	ELXQ251VSN821MR40S
	820	30×45	0.15	2.39	ELXQ251VSN821MR45S
	820	35×35	0.15	2.38	ELXQ251VSN821MA35S
	1,000	30×50	0.15	2.68	ELXQ251VSN102MR50S
	1,000	35×40	0.15	2.72	ELXQ251VSN102MA40S
	1,200	35×45	0.15	3.05	ELXQ251VSN122MA45S
	1,500	35×50	0.15	3.49	ELXQ251VSN152MA50S
315	150	22×25	0.15	0.80	ELXQ3B1VSN151MP25S
	180	22×30	0.15	0.92	ELXQ3B1VSN181MP30S
	180	25.4×25	0.15	0.94	ELXQ3B1VSN181MQ25S
	220	22×35	0.15	1.04	ELXQ3B1VSN221MP35S
	220	30×25	0.15	1.17	ELXQ3B1VSN221MR25S
	270	22×40	0.15	1.18	ELXQ3B1VSN271MP40S
	270	25.4×30	0.15	1.19	ELXQ3B1VSN271MQ30S
	330	22×45	0.15	1.33	ELXQ3B1VSN331MP45S
	330	25.4×35	0.15	1.37	ELXQ3B1VSN331MQ35S
	330	30×30	0.15	1.40	ELXQ3B1VSN331MR30S
	330	35×25	0.15	1.49	ELXQ3B1VSN331MA25S
	390	22×50	0.15	1.48	ELXQ3B1VSN391MP50S
	390	25.4×40	0.15	1.52	ELXQ3B1VSN391MQ40S
	470	25.4×45	0.15	1.70	ELXQ3B1VSN471MQ45S

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LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXQ Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
315	470	30×35	0.15	1.71	ELXQ3B1VSN471MR35S
	470	35×30	0.15	1.82	ELXQ3B1VSN471MA30S
	560	25.4×50	0.15	1.88	ELXQ3B1VSN561MQ50S
	560	30×40	0.15	1.92	ELXQ3B1VSN561MR40S
	560	30×45	0.15	1.97	ELXQ3B1VSN561MR45S
	560	35×35	0.15	2.00	ELXQ3B1VSN561MA35S
	680	30×50	0.15	2.21	ELXQ3B1VSN681MR50S
	680	35×40	0.15	2.29	ELXQ3B1VSN681MA40S
	820	35×45	0.15	2.57	ELXQ3B1VSN821MA45S
	1,000	35×50	0.15	2.89	ELXQ3B1VSN102MA50S
350	120	22×25	0.15	0.72	ELXQ351VSN121MP25S
	150	22×30	0.15	0.84	ELXQ351VSN151MP30S
	180	25.4×25	0.15	0.94	ELXQ351VSN181MQ25S
	220	22×35	0.15	1.04	ELXQ351VSN221MP35S
	220	22×40	0.15	1.06	ELXQ351VSN221MP40S
	220	25.4×30	0.15	1.07	ELXQ351VSN221MQ30S
	220	30×25	0.15	1.13	ELXQ351VSN221MR25S
	270	22×45	0.15	1.20	ELXQ351VSN271MP45S
	270	25.4×35	0.15	1.24	ELXQ351VSN271MQ35S
	270	30×30	0.15	1.27	ELXQ351VSN271MR30S
	270	35×25	0.15	1.35	ELXQ351VSN271MA25S
	330	22×50	0.15	1.36	ELXQ351VSN331MP50S
	330	25.4×40	0.15	1.39	ELXQ351VSN331MQ40S
	330	30×35	0.15	1.43	ELXQ351VSN331MR35S
	390	25.4×45	0.15	1.55	ELXQ351VSN391MQ45S
	390	30×40	0.15	1.60	ELXQ351VSN391MR40S
	390	35×30	0.15	1.66	ELXQ351VSN391MA30S
	470	25.4×50	0.15	1.72	ELXQ351VSN471MQ50S
	470	30×45	0.15	1.81	ELXQ351VSN471MR45S
	470	35×35	0.15	1.83	ELXQ351VSN471MA35S
	560	30×50	0.15	2.00	ELXQ351VSN561MR50S
	560	35×40	0.15	2.07	ELXQ351VSN561MA40S
	680	35×45	0.15	2.34	ELXQ351VSN681MA45S
	820	35×50	0.15	2.62	ELXQ351VSN821MA50S
400	100	22×25	0.15	0.66	ELXQ401VSN101MP25S
	120	22×30	0.15	0.75	ELXQ401VSN121MP30S
	150	22×35	0.15	0.86	ELXQ401VSN151MP35S
	150	25.4×25	0.15	0.86	ELXQ401VSN151MQ25S
	180	22×40	0.15	0.96	ELXQ401VSN181MP40S
	180	25.4×30	0.15	0.97	ELXQ401VSN181MQ30S
	180	30×25	0.15	1.02	ELXQ401VSN181MR25S
	220	22×45	0.15	1.09	ELXQ401VSN221MP45S
	220	25.4×35	0.15	1.12	ELXQ401VSN221MQ35S
	220	35×25	0.15	1.22	ELXQ401VSN221MA25S
	270	22×50	0.15	1.23	ELXQ401VSN271MP50S
	270	25.4×40	0.15	1.26	ELXQ401VSN271MQ40S
	270	25.4×45	0.15	1.29	ELXQ401VSN271MQ45S
	270	30×30	0.15	1.27	ELXQ401VSN271MR30S
	330	25.4×50	0.15	1.44	ELXQ401VSN331MQ50S
	330	30×35	0.15	1.43	ELXQ401VSN331MR35S
	330	35×30	0.15	1.52	ELXQ401VSN331MA30S
	390	30×40	0.15	1.60	ELXQ401VSN391MR40S
	390	35×35	0.15	1.67	ELXQ401VSN391MA35S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
400	470	30×45	0.15	1.81	ELXQ401VSN471MR45S
	470	30×50	0.15	1.84	ELXQ401VSN471MR50S
	470	35×40	0.15	1.90	ELXQ401VSN471MA40S
	560	35×45	0.15	2.12	ELXQ401VSN561MA45S
	680	35×50	0.15	2.39	ELXQ401VSN681MA50S
420	100	22×25	0.20	0.66	ELXQ421VSN101MP25S
	120	22×30	0.20	0.75	ELXQ421VSN121MP30S
	120	25.4×25	0.20	0.77	ELXQ421VSN121MQ25S
	150	22×35	0.20	0.86	ELXQ421VSN151MP35S
	180	22×40	0.20	0.96	ELXQ421VSN181MP40S
	180	22×45	0.20	0.98	ELXQ421VSN181MP45S
	180	25.4×30	0.20	0.97	ELXQ421VSN181MQ30S
	180	25.4×35	0.20	1.01	ELXQ421VSN181MQ35S
	180	30×25	0.20	1.02	ELXQ421VSN181MR25S
	220	22×50	0.20	1.11	ELXQ421VSN221MP50S
	220	25.4×40	0.20	1.14	ELXQ421VSN221MQ40S
	220	30×30	0.20	1.14	ELXQ421VSN221MR30S
	220	35×25	0.20	1.22	ELXQ421VSN221MA25S
	270	25.4×45	0.20	1.29	ELXQ421VSN271MQ45S
	270	30×35	0.20	1.30	ELXQ421VSN271MR35S
	270	35×30	0.20	1.38	ELXQ421VSN271MA30S
	330	25.4×50	0.20	1.44	ELXQ421VSN331MQ50S
	330	30×40	0.20	1.48	ELXQ421VSN331MR40S
	330	35×35	0.20	1.54	ELXQ421VSN331MA35S
	390	30×45	0.20	1.64	ELXQ421VSN391MR45S
	390	35×40	0.20	1.73	ELXQ421VSN391MA40S
	470	30×50	0.20	1.84	ELXQ421VSN471MR50S
	470	35×45	0.20	1.94	ELXQ421VSN471MA45S
	560	35×50	0.20	2.17	ELXQ421VSN561MA50S
450	82	22×25	0.20	0.59	ELXQ451VSN820MP25S
	100	22×30	0.20	0.69	ELXQ451VSN101MP30S
	100	25.4×25	0.20	0.70	ELXQ451VSN101MQ25S
	120	22×35	0.20	0.77	ELXQ451VSN121MP35S
	150	22×40	0.20	0.88	ELXQ451VSN151MP40S
	150	22×45	0.20	0.90	ELXQ451VSN151MP45S
	150	25.4×30	0.20	0.88	ELXQ451VSN151MQ30S
	150	25.4×35	0.20	0.92	ELXQ451VSN151MQ35S
	150	30×25	0.20	0.93	ELXQ451VSN151MR25S
	180	22×50	0.20	1.01	ELXQ451VSN181MP50S
	180	25.4×40	0.20	1.03	ELXQ451VSN181MQ40S
	180	30×30	0.20	1.03	ELXQ451VSN181MR30S
	180	35×25	0.20	1.10	ELXQ451VSN181MA25S
	220	25.4×45	0.20	1.16	ELXQ451VSN221MQ45S
	220	30×35	0.20	1.17	ELXQ451VSN221MR35S
	220	35×30	0.20	1.24	ELXQ451VSN221MA30S
	270	25.4×50	0.20	1.31	ELXQ451VSN271MQ50S
	270	30×40	0.20	1.33	ELXQ451VSN271MR40S
	270	35×35	0.20	1.39	ELXQ451VSN271MA35S
	330	30×45	0.20	1.51	ELXQ451VSN331MR45S
	390	30×50	0.20	1.67	ELXQ451VSN391MR50S
	390	35×40	0.20	1.73	ELXQ451VSN391MA40S
	390	35×45	0.20	1.77	ELXQ451VSN391MA45S
	470	35×50	0.20	1.98	ELXQ451VSN471MA50S

◆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
315 to 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXG Series

- Endurance with ripple current : 5,000 hours at 105℃
- Non solvent resistant type
- **RoHS Compliant**

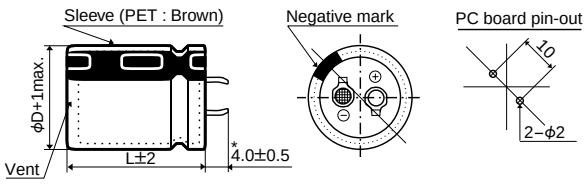
LXG
↑ Longer life
KMH

◆SPECIFICATIONS

Items	Characteristics								
Category Temperature Range	−40 to +105℃								
Rated Voltage Range	10 to 100Vdc								(at 20℃, 120Hz)
Capacitance Tolerance	±20% (M)								
Leakage Current	I=0.02CV or 3mA, 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)	Rated voltage (Vdc)	10V	16V	25V	35V	50V	63V	80 & 100V	
	tanδ (Max.)	0.60	0.45	0.30	0.25	0.20	0.15	0.15	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Capacitance change : Capacitance at the lowest operating temperature shall not be less than 70% of the 20℃ value.								
	Rated voltage (Vdc)	10V	16V	25V	35V	50V	63V	80 & 100V	
	Z(−25℃)/Z(+20℃)	4	4	3	3	2	2	2	
	Z(−40℃)/Z(+20℃)	15	15	10	8	6	6	5	(at 120Hz)
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with rated ripple current is applied for 5,000 hours at 105℃.								
	Capacitance change	≦±25% of the initial value							
	D.F. (tanδ)	≦250% 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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.								
	Capacitance change	≦±20% of the initial value							
	D.F. (tanδ)	≦150% of the initial specified value							
	Leakage current	≦The initial specified value							

◆DIMENSIONS [mm]

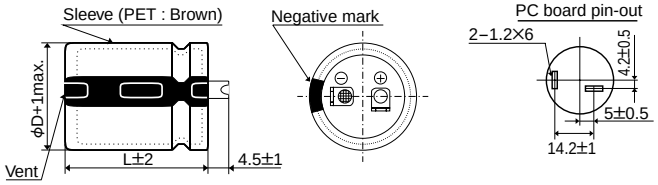
●Terminal Code : VS (φ22 to φ35) : Standard



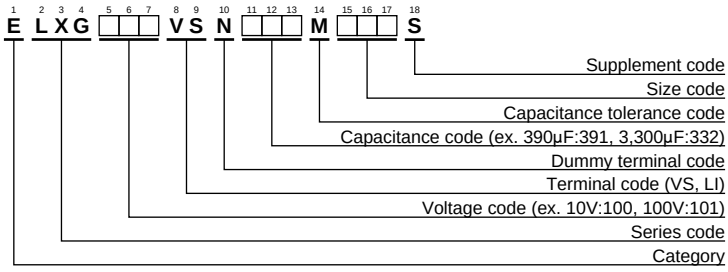
*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

●Terminal Code : LI (φ35)



◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

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

The endurance of capacitors is reduced 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.

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
10	6,800	22×25	0.60	1.30	ELXG100VSN682MP25S
	10,000	22×30	0.60	1.65	ELXG100VSN103MP30S
	10,000	25.4×25	0.60	1.64	ELXG100VSN103MQ25S
	12,000	22×35	0.60	1.85	ELXG100VSN123MP35S
	12,000	25.4×30	0.60	1.85	ELXG100VSN123MQ30S
	12,000	30×25	0.60	1.89	ELXG100VSN123MR25S
	15,000	22×40	0.60	2.12	ELXG100VSN153MP40S
	15,000	25.4×35	0.60	2.16	ELXG100VSN153MQ35S
	18,000	22×50	0.60	2.45	ELXG100VSN183MP50S
	18,000	25.4×40	0.60	2.43	ELXG100VSN183MQ40S
	18,000	30×30	0.60	2.37	ELXG100VSN183MR30S
	18,000	35×25	0.60	2.42	ELXG100VSN183MA25S
	22,000	30×35	0.60	2.73	ELXG100VSN223MR35S
	22,000	35×30	0.60	2.79	ELXG100VSN223MA30S
	27,000	25.4×50	0.60	3.11	ELXG100VSN273MQ50S
	27,000	30×40	0.60	3.13	ELXG100VSN273MR40S
	33,000	35×35	0.60	3.49	ELXG100VSN333MA35S
	39,000	30×50	0.60	3.99	ELXG100VSN393MR50S
	39,000	35×40	0.60	3.96	ELXG100VSN393MA40S
	47,000	35×50	0.60	4.62	ELXG100VSN473MA50S
16	5,600	22×25	0.45	1.44	ELXG160VSN562MP25S
	6,800	22×30	0.45	1.66	ELXG160VSN682MP30S
	6,800	25.4×25	0.45	1.66	ELXG160VSN682MQ25S
	8,200	22×35	0.45	1.87	ELXG160VSN822MP35S
	10,000	22×40	0.45	2.12	ELXG160VSN103MP40S
	10,000	25.4×30	0.45	2.07	ELXG160VSN103MQ30S
	10,000	30×25	0.45	2.11	ELXG160VSN103MR25S
	12,000	25.4×35	0.45	2.37	ELXG160VSN123MQ35S
	12,000	30×30	0.45	2.37	ELXG160VSN123MR30S
	12,000	35×25	0.45	2.42	ELXG160VSN123MA25S
	15,000	22×50	0.45	2.74	ELXG160VSN153MP50S
	15,000	25.4×40	0.45	2.71	ELXG160VSN153MQ40S
	18,000	25.4×50	0.45	3.11	ELXG160VSN183MQ50S
	18,000	30×35	0.45	3.02	ELXG160VSN183MR35S
	18,000	35×30	0.45	3.09	ELXG160VSN183MA30S
	22,000	30×40	0.45	3.46	ELXG160VSN223MR40S
	22,000	35×35	0.45	3.49	ELXG160VSN223MA35S
	27,000	30×50	0.45	4.07	ELXG160VSN273MR50S
	27,000	35×40	0.45	4.04	ELXG160VSN273MA40S
	39,000	35×50	0.45	5.16	ELXG160VSN393MA50S
25	3,900	22×25	0.30	1.31	ELXG250VSN392MP25S
	4,700	22×30	0.30	1.51	ELXG250VSN472MP30S
	4,700	25.4×25	0.30	1.51	ELXG250VSN472MQ25S
	5,600	22×35	0.30	1.70	ELXG250VSN562MP35S
	6,800	22×40	0.30	1.92	ELXG250VSN682MP40S
	6,800	25.4×30	0.30	1.87	ELXG250VSN682MQ30S
	6,800	30×25	0.30	1.90	ELXG250VSN682MR25S
	8,200	25.4×35	0.30	2.14	ELXG250VSN822MQ35S
	8,200	30×30	0.30	2.15	ELXG250VSN822MR30S
	8,200	35×25	0.30	2.19	ELXG250VSN822MA25S
	10,000	22×50	0.30	2.45	ELXG250VSN103MP50S
	10,000	25.4×40	0.30	2.43	ELXG250VSN103MQ40S
	12,000	25.4×50	0.30	2.78	ELXG250VSN123MQ50S
	12,000	30×35	0.30	2.70	ELXG250VSN123MR35S
	12,000	35×30	0.30	2.76	ELXG250VSN123MA30S
	15,000	30×40	0.30	3.13	ELXG250VSN153MR40S
	15,000	35×35	0.30	3.16	ELXG250VSN153MA35S
	18,000	30×50	0.30	3.64	ELXG250VSN183MR50S
	18,000	35×40	0.30	3.61	ELXG250VSN183MA40S
	27,000	35×50	0.30	4.70	ELXG250VSN273MA50S
35	2,200	22×25	0.25	1.10	ELXG350VSN222MP25S
	3,300	22×30	0.25	1.42	ELXG350VSN332MP30S
	3,300	25.4×25	0.25	1.41	ELXG350VSN332MQ25S
	3,900	22×35	0.25	1.58	ELXG350VSN392MP35S
	3,900	25.4×30	0.25	1.58	ELXG350VSN392MQ30S
	4,700	22×40	0.25	1.78	ELXG350VSN472MP40S
	4,700	30×25	0.25	1.77	ELXG350VSN472MR25S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
35	5,600	25.4×35	0.25	1.98	ELXG350VSN562MQ35S
	5,600	30×30	0.25	1.98	ELXG350VSN562MR30S
	5,600	35×25	0.25	2.03	ELXG350VSN562MA25S
	6,800	22×50	0.25	2.26	ELXG350VSN682MP50S
	6,800	25.4×40	0.25	2.24	ELXG350VSN682MQ40S
	8,200	25.4×50	0.25	2.57	ELXG350VSN822MQ50S
	8,200	30×35	0.25	2.50	ELXG350VSN822MR35S
	8,200	35×30	0.25	2.55	ELXG350VSN822MA30S
	10,000	30×40	0.25	2.86	ELXG350VSN103MR40S
	10,000	35×35	0.25	2.88	ELXG350VSN103MA35S
	12,000	30×50	0.25	3.32	ELXG350VSN123MR50S
	12,000	35×40	0.25	3.30	ELXG350VSN123MA40S
	18,000	35×50	0.25	4.29	ELXG350VSN183MA50S
50	1,500	22×25	0.20	1.02	ELXG500VSN152MP25S
	1,800	22×30	0.20	1.17	ELXG500VSN182MP30S
	1,800	25.4×25	0.20	1.17	ELXG500VSN182MQ25S
	2,200	22×35	0.20	1.33	ELXG500VSN222MP35S
	2,700	22×40	0.20	1.51	ELXG500VSN272MP40S
	2,700	25.4×30	0.20	1.47	ELXG500VSN272MQ30S
	2,700	30×25	0.20	1.50	ELXG500VSN272MR25S
	3,300	25.4×35	0.20	1.70	ELXG500VSN332MQ35S
	3,300	30×30	0.20	1.70	ELXG500VSN332MR30S
	3,300	35×25	0.20	1.74	ELXG500VSN332MA25S
	3,900	22×50	0.20	1.91	ELXG500VSN392MP50S
	3,900	25.4×40	0.20	1.89	ELXG500VSN392MQ40S
	4,700	30×35	0.20	2.11	ELXG500VSN472MR35S
	4,700	35×30	0.20	2.16	ELXG500VSN472MA30S
	5,600	25.4×50	0.20	2.38	ELXG500VSN562MQ50S
	5,600	30×40	0.20	2.39	ELXG500VSN562MR40S
	5,600	35×35	0.20	2.41	ELXG500VSN562MA35S
	6,800	30×50	0.20	2.79	ELXG500VSN682MR50S
	6,800	35×40	0.20	2.78	ELXG500VSN682MA40S
	10,000	35×50	0.20	3.57	ELXG500VSN103MA50S
63	1,000	22×25	0.15	1.00	ELXG630VSN102MP25S
	1,200	22×30	0.15	1.15	ELXG630VSN122MP30S
	1,200	25.4×25	0.15	1.15	ELXG630VSN122MQ25S
	1,500	22×35	0.15	1.32	ELXG630VSN152MP35S
	1,800	22×40	0.15	1.49	ELXG630VSN182MP40S
	1,800	25.4×30	0.15	1.45	ELXG630VSN182MQ30S
	1,800	30×25	0.15	1.48	ELXG630VSN182MR25S
	2,200	25.4×35	0.15	1.67	ELXG630VSN222MQ35S
	2,200	30×30	0.15	1.68	ELXG630VSN222MR30S
	2,200	35×25	0.15	1.71	ELXG630VSN222MA25S
	2,700	22×50	0.15	1.92	ELXG630VSN272MP50S
	2,700	25.4×40	0.15	1.90	ELXG630VSN272MQ40S
	2,700	30×35	0.15	1.93	ELXG630VSN272MR35S
	3,300	25.4×50	0.15	2.20	ELXG630VSN332MQ50S
	3,300	35×30	0.15	2.18	ELXG630VSN332MA30S
	3,900	30×40	0.15	2.41	ELXG630VSN392MR40S
	3,900	35×35	0.15	2.43	ELXG630VSN392MA35S
	4,700	30×50	0.15	2.80	ELXG630VSN472MR50S
	4,700	35×40	0.15	2.78	ELXG630VSN472MA40S
	6,800	35×50	0.15	3.55	ELXG630VSN682MA50S
80	680	22×25	0.15	0.97	ELXG800VSN681MP25S
	820	22×30	0.15	1.12	ELXG800VSN821MP30S
	1,000	22×35	0.15	1.27	ELXG800VSN102MP35S
	1,000	25.4×25	0.15	1.23	ELXG800VSN102MQ25S
	1,200	22×40	0.15	1.42	ELXG800VSN122MP40S
	1,200	25.4×30	0.15	1.39	ELXG800VSN122MQ30S
	1,200	30×25	0.15	1.41	ELXG800VSN122MR25S
	1,500	25.4×35	0.15	1.62	ELXG800VSN152MQ35S
	1,800	22×50	0.15	1.84	ELXG800VSN182MP50S
	1,800	25.4×40	0.15	1.82	ELXG800VSN182MQ40S
	1,800	30×30	0.15	1.78	ELXG800VSN182MR30S
	1,800	35×25	0.15	1.82	ELXG800VSN182MA25S
	2,200	25.4×50	0.15	2.11	ELXG800VSN222MQ50S
	2,200	30×35	0.15	2.05	ELXG800VSN222MR35S

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105℃

LXG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
80	2,200	35×30	0.15	2.09	ELXG800VSN222MA30S
	2,700	30×40	0.15	2.35	ELXG800VSN272MR40S
	2,700	35×35	0.15	2.37	ELXG800VSN272MA35S
	3,300	30×50	0.15	2.75	ELXG800VSN332MR50S
	3,300	35×40	0.15	2.73	ELXG800VSN332MA40S
	4,700	35×50	0.15	3.46	ELXG800VSN472MA50S
100	390	22×25	0.15	0.78	ELXG101VSN391MP25S
	560	22×30	0.15	0.99	ELXG101VSN561MP30S
	560	25.4×25	0.15	0.98	ELXG101VSN561MQ25S
	680	22×35	0.15	1.12	ELXG101VSN681MP35S
	820	22×40	0.15	1.26	ELXG101VSN821MP40S
	820	25.4×30	0.15	1.23	ELXG101VSN821MQ30S
	820	30×25	0.15	1.25	ELXG101VSN821MR25S

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
100	1,000	25.4×35	0.15	1.41	ELXG101VSN102MQ35S
	1,000	30×30	0.15	1.42	ELXG101VSN102MR30S
	1,000	35×25	0.15	1.45	ELXG101VSN102MA25S
	1,200	22×50	0.15	1.60	ELXG101VSN122MP50S
	1,200	25.4×40	0.15	1.59	ELXG101VSN122MQ40S
	1,200	30×35	0.15	1.61	ELXG101VSN122MR35S
	1,500	25.4×50	0.15	1.86	ELXG101VSN152MQ50S
	1,500	30×40	0.15	1.87	ELXG101VSN152MR40S
	1,500	35×30	0.15	1.85	ELXG101VSN152MA30S
	1,800	35×35	0.15	2.07	ELXG101VSN182MA35S
	2,200	30×50	0.15	2.40	ELXG101VSN222MR50S
	2,200	35×40	0.15	2.39	ELXG101VSN222MA40S
	2,700	35×50	0.15	2.81	ELXG101VSN272MA50S

◆MAXIMUM IMPEDANCE [mΩ/20℃, 30kHz]

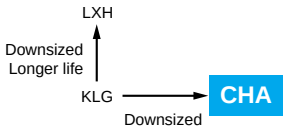
Vdc / Case size φDXL (mm)	10 to 63	80	100
22X25	120	150	
22X30	100	120	
22X35	80	95	
22X40	70	80	
22X50	50	60	
25.4X25	90	110	
25.4X30	70	85	
25.4X35	60	70	
25.4X40	50	60	
25.4X50	40	45	
30X25	70	80	
30X30	50	60	
30X35	40	50	
30X40	35	40	
30X50	25	30	
35X25	65	70	
35X30	45	50	
35X35	38	40	
35X40	30	30	
35X50	23	25	

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Overvoltage resistant design, 105℃

CHA Series

- Doesn't spark with DC over voltage
- Downsized from current KLG series
- Endurance with ripple current : 2,000hours at 105℃
- Non solvent resistant type
- **RoHS Compliant**

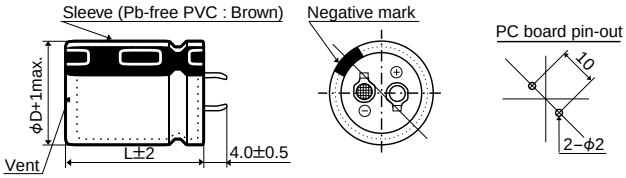


◆SPECIFICATIONS

Items	Characteristics		
Category Temperature Range	−25 to +105℃		
Rated Voltage Range	200 to 450Vdc		
Capacitance Tolerance	±20% (M)		(at 20℃, 120Hz)
Leakage Current	I≦3√CV Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (Vdc)		(at 20℃ after 5 minutes)
Dissipation Factor (tanδ)	200Vdc : 0.15 max. (0.20 max. for φD=35mm) 400Vdc : 0.15 max.		(at 20℃, 120Hz)
Low Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage (Vdc)	200 to 450V	
	Z(-25℃) / Z(+20℃)	4	(at 120Hz)
ESL	50nH max.		(at 20℃, 1MHz)
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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.		
	Capacitance change	≦±15% of the initial value	
	D.F. (tanδ)	≦150% of the initial specified value	
	Leakage current	≦The initial specified value	

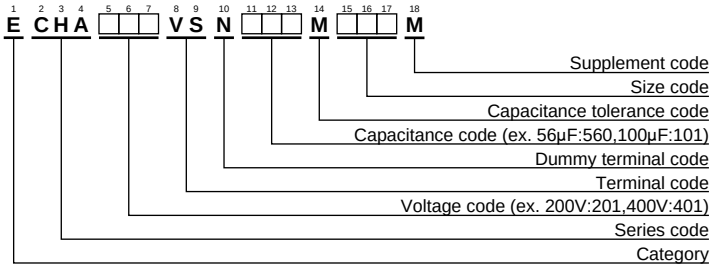
◆DIMENSIONS [mm]

- Terminal Code : VS (φ22 to φ35)



The standard design has no plastic disc.

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

◆RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

Frequency (Hz)	50	120	300	1k	10k	50k
200 to 450Vdc	0.77	1.00	1.16	1.30	1.41	1.43

The endurance of capacitors is reduced 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.

CAT. No. E1001H

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Overvoltage resistant design, 105℃

CHA Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
200	180	22×20	0.15	0.82	ECHA201VSN181MP20M
	220	22×20	0.15	0.90	ECHA201VSN221MP20M
	270	22×25	0.15	1.02	ECHA201VSN271MP25M
	330	22×30	0.15	1.20	ECHA201VSN331MP30M
	330	25.4×25	0.15	1.20	ECHA201VSN331MQ25M
	390	22×30	0.15	1.35	ECHA201VSN391MP30M
	390	25.4×25	0.15	1.35	ECHA201VSN391MQ25M
	470	22×35	0.15	1.45	ECHA201VSN471MP35M
	470	25.4×30	0.15	1.45	ECHA201VSN471MQ30M
	470	30×25	0.15	1.47	ECHA201VSN471MR25M
	560	22×40	0.15	1.62	ECHA201VSN561MP40M
	560	25.4×30	0.15	1.60	ECHA201VSN561MQ30M
	560	30×25	0.15	1.60	ECHA201VSN561MR25M
	680	25.4×35	0.15	1.82	ECHA201VSN681MQ35M
	680	30×30	0.15	1.81	ECHA201VSN681MR30M
	680	35×25	0.20	1.86	ECHA201VSN681MA25M
	820	25.4×45	0.15	2.11	ECHA201VSN821MQ45M
	820	30×35	0.15	2.11	ECHA201VSN821MR35M
	820	35×25	0.20	2.11	ECHA201VSN821MA25M
	1,000	30×35	0.15	2.40	ECHA201VSN102MR35M
	1,000	35×30	0.20	2.40	ECHA201VSN102MA30M
	1,200	30×45	0.15	2.69	ECHA201VSN122MR45M
	1,200	35×35	0.20	2.65	ECHA201VSN122MA35M
250	120	22×20	0.15	0.68	ECHA251VSN121MP20M
	180	22×25	0.15	0.87	ECHA251VSN181MP25M
	180	25.4×20	0.15	0.93	ECHA251VSN181MQ20M
	220	22×30	0.15	1.00	ECHA251VSN221MP30M
	270	22×35	0.15	1.14	ECHA251VSN271MP35M
	270	25.4×25	0.15	1.13	ECHA251VSN271MQ25M
	270	30×20	0.15	1.25	ECHA251VSN271MR20M
	330	22×40	0.15	1.28	ECHA251VSN331MP40M
	330	25.4×30	0.15	1.29	ECHA251VSN331MQ30M
	390	22×45	0.15	1.42	ECHA251VSN391MP45M
	390	25.4×35	0.15	1.46	ECHA251VSN391MQ35M
	390	30×25	0.15	1.52	ECHA251VSN391MR25M

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/ 105℃,120Hz)	Part No.
250	390	35×20	0.20	1.62	ECHA251VSN391MA20M
	470	25.4×40	0.15	1.64	ECHA251VSN471MQ40M
	470	30×30	0.15	1.67	ECHA251VSN471MR30M
	560	25.4×45	0.15	1.82	ECHA251VSN561MQ45M
	560	30×35	0.15	1.87	ECHA251VSN561MR35M
	560	35×25	0.20	1.99	ECHA251VSN561MA25M
	680	30×40	0.15	2.12	ECHA251VSN681MR40M
	680	35×30	0.20	2.19	ECHA251VSN681MA30M
	820	30×45	0.15	2.39	ECHA251VSN821MR45M
	820	35×35	0.20	2.42	ECHA251VSN821MA35M
400	56	22×20	0.15	0.45	ECHA401VSN560MP20M
	68	22×20	0.15	0.51	ECHA401VSN680MP20M
	82	22×25	0.15	0.58	ECHA401VSN820MP25M
	100	22×25	0.15	0.66	ECHA401VSN101MP25M
	100	25.4×25	0.15	0.66	ECHA401VSN101MQ25M
	120	22×30	0.15	0.76	ECHA401VSN121MP30M
	120	25.4×25	0.15	0.76	ECHA401VSN121MQ25M
	150	22×35	0.15	0.85	ECHA401VSN151MP35M
	150	25.4×30	0.15	0.85	ECHA401VSN151MQ30M
	150	30×25	0.15	0.85	ECHA401VSN151MR25M
	180	22×40	0.15	0.94	ECHA401VSN181MP40M
	180	25.4×35	0.15	0.95	ECHA401VSN181MQ35M
	180	30×25	0.15	0.95	ECHA401VSN181MR25M
	220	25.4×35	0.15	1.24	ECHA401VSN221MQ35M
	220	30×30	0.15	1.24	ECHA401VSN221MR30M
	220	35×25	0.15	1.24	ECHA401VSN221MA25M
	270	25.4×45	0.15	1.30	ECHA401VSN271MQ45M
	270	30×35	0.15	1.30	ECHA401VSN271MR35M
	270	35×25	0.15	1.30	ECHA401VSN271MA25M
	330	30×40	0.15	1.47	ECHA401VSN331MR40M
	330	35×30	0.15	1.47	ECHA401VSN331MA30M
450	180	30×35	0.20	1.00	ECHA451VSN181MR35M
	220	30×40	0.20	1.20	ECHA451VSN221MR40M
	390	35×40	0.20	1.60	ECHA451VSN391MA40M

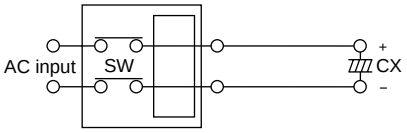
◆DC OVERVOLTAGE TEST CONDITIONS

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

●Test DC voltage

Rated Voltage	Nominal Capacitance	Current Limit	Test Voltage
200Vdc	<330	4A	300/375Vdc
	330μF≦C<470μF	5A	
	≧470μF	7A	
250Vdc	<330μF	4A	350/450Vdc
	330μF≦C<470μF	5A	
	≧470μF	7A	
400Vdc	<100μF	2A	500/600Vdc
	100μF≦C<220μF	4A	
	≧220μF	7A	
450Vdc	<100μF	2A	550/675Vdc
	100μF≦C<220μF	4A	
	≧220μF	7A	

●Test Circuit



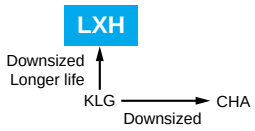
Constant DC voltage/current power supply

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Long life, Overvoltage resistant design, 105℃

LXH Series

- ●Doesn't spark with DC over voltage
- ●Same case sizes of KMH
- ●Endurance with ripple current : 5,000 hours at 105℃
- ●Non solvent resistant type
- ●**RoHS Compliant**

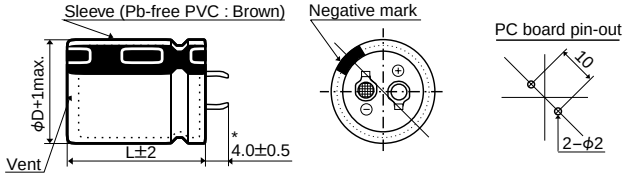


◆SPECIFICATIONS

Items	Characteristics
Category Temperature Range	−25 to +105℃
Rated Voltage	200 & 400Vdc
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.02CV or 3mA, 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)	0.15 max. (at 20℃, 120Hz)
Low Temperature Characteristics	Z(−25℃) /Z(+20℃)≦4 (at 120Hz)
ESL	50nH max. (at 20℃, 1MHz)
DC Overvoltage Test	When an excessive DC voltage is applied to the capacitors under the test conditions on next page, the vent shall operate and then the capacitors shall become open-circuit without burning materials.
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 or 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. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. Capacitance change: ≦±15% of the initial value D.F. (tanδ): ≦150% of the initial specified value Leakage current: ≦The initial specified value

◆DIMENSIONS [mm]

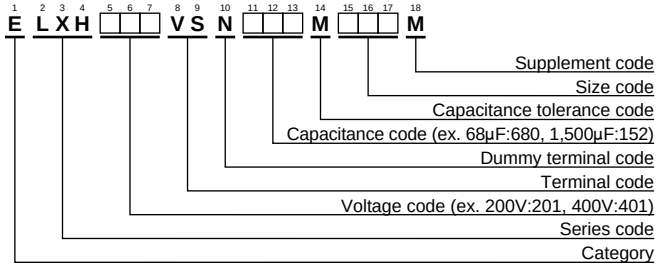
●Terminal Code : VS (ϕ22 to ϕ35)



*ϕD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency (Hz)	50	120	300	1k	10k	50k
200Vdc	0.81	1.00	1.17	1.32	1.45	1.50
400Vdc	0.77	1.00	1.16	1.30	1.41	1.43

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

NIPPON CHEMI-CON

LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Long life, Overvoltage resistant design, 105℃

LXH Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φD×L(mm)	tanδ	Rated ripple current (Arms/105℃,120Hz)		Part No.
				5,000 hours	3,000 hours	
200	270	22×25	0.15	0.45	0.87	ELXH201VSN271MP25M
	330	22×30	0.15	0.62	1.20	ELXH201VSN331MP30M
	330	25.4×25	0.15	0.62	1.21	ELXH201VSN331MQ25M
	390	22×35	0.15	0.67	1.31	ELXH201VSN391MP35M
	390	25.4×30	0.15	0.66	1.28	ELXH201VSN391MQ30M
	470	22×40	0.15	0.72	1.40	ELXH201VSN471MP40M
	470	25.4×30	0.15	0.72	1.41	ELXH201VSN471MQ30M
	470	30×25	0.15	0.77	1.50	ELXH201VSN471MR25M
	560	22×45	0.15	0.80	1.56	ELXH201VSN561MP45M
	560	25.4×35	0.15	0.78	1.53	ELXH201VSN561MQ35M
	560	30×30	0.15	0.81	1.57	ELXH201VSN561MR30M
	680	22×50	0.15	0.89	1.74	ELXH201VSN681MP50M
	680	25.4×40	0.15	0.89	1.74	ELXH201VSN681MQ40M
	680	30×30	0.15	0.89	1.74	ELXH201VSN681MR30M
	680	35×25	0.15	0.88	1.72	ELXH201VSN681MA25M
	820	25.4×50	0.15	1.05	2.04	ELXH201VSN821MQ50M
	820	30×35	0.15	1.03	2.00	ELXH201VSN821MR35M
	820	35×30	0.15	1.05	2.04	ELXH201VSN821MA30M
	1,000	30×45	0.15	1.18	2.30	ELXH201VSN102MR45M
	1,000	35×35	0.15	1.18	2.30	ELXH201VSN102MA35M
	1,200	30×50	0.15	1.33	2.60	ELXH201VSN122MR50M
	1,200	35×40	0.15	1.36	2.65	ELXH201VSN122MA40M
	1,500	35×45	0.15	1.57	3.08	ELXH201VSN152MA45M
400	68	22×25	0.15	0.26	0.51	ELXH401VSN680MP25M
	68	25.4×20	0.15	0.24	0.46	ELXH401VSN680MQ20M
	82	22×30	0.15	0.30	0.58	ELXH401VSN820MP30M
	82	25.4×25	0.15	0.30	0.58	ELXH401VSN820MQ25M
	100	22×35	0.15	0.34	0.66	ELXH401VSN101MP35M
	100	25.4×30	0.15	0.34	0.66	ELXH401VSN101MQ30M
	120	22×40	0.15	0.37	0.72	ELXH401VSN121MP40M
	120	25.4×30	0.15	0.37	0.72	ELXH401VSN121MQ30M
	120	30×25	0.15	0.39	0.76	ELXH401VSN121MR25M
	150	22×45	0.15	0.42	0.82	ELXH401VSN151MP45M
	150	25.4×35	0.15	0.43	0.84	ELXH401VSN151MQ35M
	150	30×30	0.15	0.43	0.84	ELXH401VSN151MR30M
	180	22×50	0.15	0.49	0.95	ELXH401VSN181MP50M
	180	25.4×40	0.15	0.48	0.94	ELXH401VSN181MQ40M
	180	30×30	0.15	0.47	0.92	ELXH401VSN181MR30M
	180	35×25	0.15	0.48	0.94	ELXH401VSN181MA25M
	220	25.4×45	0.15	0.55	1.07	ELXH401VSN221MQ45M
	220	30×35	0.15	0.54	1.06	ELXH401VSN221MR35M
	220	35×30	0.15	0.55	1.08	ELXH401VSN221MA30M
	270	25.4×50	0.15	0.62	1.21	ELXH401VSN271MQ50M
	270	30×40	0.15	0.62	1.21	ELXH401VSN271MR40M
	270	35×30	0.15	0.59	1.15	ELXH401VSN271MA30M
	330	30×45	0.15	0.71	1.39	ELXH401VSN331MR45M
	330	35×35	0.15	0.69	1.35	ELXH401VSN331MA35M
	390	30×50	0.15	0.80	1.55	ELXH401VSN391MR50M
	390	35×40	0.15	0.79	1.54	ELXH401VSN391MA40M
	470	35×45	0.15	0.89	1.74	ELXH401VSN471MA45M

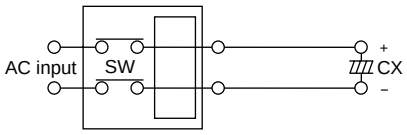
◆DC OVERVOLTAGE TEST CONDITIONS

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

●Test DC voltage

Rated Voltage	Capacitance	Current limit	Test DC voltage
200Vdc	<330μF	4A	300/375Vdc
	330≦C<470μF	5A	
	≧470μF	7A	
400Vdc	<100μF	2A	500/600Vdc
	100≦C<220μF	4A	
	≧220μF	7A	

●Test Circuit



Constant DC voltage/current power supply

NIPPON CHEMI-CON

PART NUMBERING SYSTEM

Appendix (Part number)

◆Capacitance code

* How to use the table

	1st
2nd	Cap. Value

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

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)

Example of conversion

Real cap.	The first 2 digits	Treatment of fraction	Code 11th	12th	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 a plastic disk.
We also produce Pb-free snap-in type with "Plastic disk, Pb-free PVC sleeve and Sn100% terminal plating".
In this case, supplement code (the 18th digit) is "T".

Screw mount terminal type

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