

Products Catalog

Aluminum Electrolytic Capacitors

Radial Lead Type



**IN Your
Future**



Aluminum Electrolytic Capacitors (Radial lead type) INDEX

Item		Page
Guideline		1
Selection guide	Diagram	8
	Explanation of part numbers	9
	Lead taping radial lead type	10
	Packaging specifications	12
Series	FR-A : 105 °C 3000 to 5000 h	13
	FS-A : 105 °C 5000 to 10000 h	18
	FP-A : 105 °C 4000 to 5000 h	23
	★ED-A : 105 °C 8000 to 10000 h	25
	GA-A : 105 °C 1000 h	28
	KA-A : 85 °C 1000 h	30
	KA-A (Bi-polar) : 85 °C 1000 h	32
	KS-A : 85 °C 1000 h	34
	KS-A (Bi-polar) : 85 °C 1000 h	36
This Series is no longer available for purchase in the country of Japan.		
Series	★FC-A : 105 °C 1000 to 5000 h	38
	★FK-A : 105 °C 3000 to 5000 h	48
	FM-A : 105 °C 2000 to 7000 h	53
	★EB-A : 105 °C 5000 to 10000 h	57
	★EE-A : 105 °C 8000 to 10000 h	60
	TA-A : 125 °C 2000 h	64
	TP-A : 125 °C 2000 to 5000 h	67
	HD-A : 105 °C 1000 to 2000 h	69
	★NHG-A : 105 °C 1000 to 2000 h	72
	GA-A (Bi-polar) : 105 °C 1000 to 2000 h	77
	★M-A : 85 °C 2000 h	79
	SU-A (Bi-polar) : 85 °C 2000 h	84

★Some part number have been designated Not Recommended for New Design.

Guidelines and precautions regarding the technical information and use of our products described in this online catalog.

- If you want to use our products described in this online catalog for applications requiring special qualities or reliability, or for applications where the failure or malfunction of the products may directly jeopardize human life or potentially cause personal injury (e.g. aircraft and aerospace equipment, traffic and transportation equipment, combustion equipment, medical equipment, accident prevention, anti-crime equipment, and/or safety equipment), it is necessary to verify whether the specifications of our products fit to such applications. Please ensure that you will ask and check with our inquiry desk as to whether the specifications of our products fit to such applications use before you use our products.
- The quality and performance of our products as described in this online catalog only apply to our products when used in isolation. Therefore, please ensure you evaluate and verify our products under the specific circumstances in which our products are assembled in your own products and in which our products will actually be used.
- Please ensure the safety by means of protection circuit, redundant circuit etc. in your system design in order to prevent the occurrence of life crisis and other serious damages due to the failure of our products.
- The products and product specifications described in this online catalog are subject to change for improvement without prior notice. Therefore, please be sure to request and confirm the latest product specifications which explain the specifications of our products in detail, before you finalize the design of your applications, purchase, or use our products.
- The technical information in this online catalog provides examples of our products' typical operations and application circuits. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right, or interest in our intellectual property.
- If any of our products, product specifications and/or technical information in this catalog is to be exported, the laws and regulations of the exporting country, especially with regard to security and export control, shall be observed.

<Regarding the Certificate of Compliance with the EU RoHS Directive/REACH Regulations>

- The switchover date for compliance with the RoHS Directive/REACH Regulations varies depending on the part number or series of our products.
- When you use the inventory of our products for which it is unclear whether those products are compliant with the RoHS Directive/REACH Regulation, please select "Sales Inquiry" in the website inquiry form and contact us.

Please note that we do not owe any liability and responsibility if our products are used beyond the description of this catalog or without complying with precautions in this catalog.

Notices

■ Applicable laws and regulations

- This product complies with the RoHS Directive (Restriction of the use of certain hazardous substances in electrical and electronic equipment (DIRECTIVE 2011/65/EU and (EU)2015/863)).
- No Ozone Depleting Chemicals(ODC's), controlled under the Montreal Protocol Agreement, are used in producing this product. We do not use PBBs or PBDEs as brominated flame retardants.
- Follow export procedures in accordance with the Foreign Exchange and Foreign Trade Law and other export-related laws and regulations when exporting this product.
- These products are not dangerous goods on the transportation as identified by UN(United Nations) numbers or UN classification.

■ Limited applications

- This capacitor is designed to be used for electronics circuits such as audio/visual equipment, home appliances, computers and other office equipment, optical equipment, measuring equipment.
- An advanced specification must be signed individually for high-reliability use that might threaten human life or property due to a malfunction of the capacitor.

■ Intellectual property rights and licenses

- The technical information in this specification provides examples of our products' typical operations and application circuits. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right, or interest in our intellectual property.

Items to be observed

■ For specification

- This specification guarantees the quality and performance of the product as individual components.
The durability differs depending on the environment and the conditions of usage.
Before use, check and evaluate their compatibility with actual conditions when installed in the products.
When safety requirements cannot be satisfied in your technical examination, inform us immediately.
- Do not use the products beyond the specifications described in this document.

■ Upon application to products where safety is regarded as important

If a malfunction of this product may result in the loss of human life or other serious damage, in traffic transportation equipment (trains, automobiles, traffic signals, etc.), medical equipment, aerospace equipment, electric heating equipment, combustion and gas equipment, rotating equipment, disaster prevention and security equipment, etc., ensure safety by giving sufficient consideration to a fail-safe design, for example, by considering the following items.

- (1) The system is equipped with a protection circuit and protection device.
- (2) The system is equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault.

■ Conditions of use

- Before using the products, carefully check the effects on their quality and performance, and determined whether or not they can be used. These products are designed and manufactured for general-purpose and standard use in general electronic equipment. These products are not intended for use in the following special conditions.
 - (1) In liquid, such as Water, Oil, Chemicals, or Organic solvent.
 - (2) In direct sunlight, outdoors, or in dust.
 - (3) In vapor, such as dew condensation water of resistive element, or water leakage, salty air, or air with a high concentration corrosive gas, such as Cl₂, H₂S, NH₃, SO₂, or NO_x.
 - (4) In an environment where strong static electricity or electromagnetic waves exist.
 - (5) Mounting or placing heat-generating components or inflammables, such as vinyl-coated wires, near these products.
 - (6) Sealing or coating of these products or a printed circuit board on which these products are mounted, with resin and other material.
 - (7) Using solvent, water or water-soluble cleaner for flux cleaning agent after soldering. (In particular, when using water or a water-soluble cleaning agent, be careful not to leave water residues)
 - (8) Using in the atmosphere where strays acid or alkaline.
 - (9) Using in the atmosphere where there are excessive vibration and shock.
 - (10) Using in the atmosphere where there are low pressure or decompression.
- Please arrange circuit design for preventing impulse or transitional voltage.
Ensure that the voltage is lower than the rated voltage in the following condition: shock voltage circuits, transient phenomena in which excessive high voltage is applied in a short period of time, or when pulse high voltage is applied.
- Our products there is a product are using an electrolyte solution. Therefore, misuse can result in rapid deterioration of characteristics and functions of each product. Electrolyte leakage damages printed circuit and affects performance, characteristics, and functions of customer system.



Application guidelines (Radial Lead Type)

1. Circuit design

1.1 Operating temperature and frequency

Electrical characteristics of the capacitor are likely to change due to variation in temperature and/or frequency. Circuit designers should take these changes into consideration.

(1) Effects of operating temperature on electrical parameters

At higher temperatures : leakage current and capacitance increase while equivalent series resistance (ESR) decreases.

At lower temperatures : leakage current and capacitance decrease while equivalent series resistance (ESR) increases.

(2) Effects of frequency on electrical parameters

At higher frequencies : capacitance and impedance decrease while tan d increases.

At lower frequencies : heat generated by ripple current will rise due to an increase in equivalent series resistance (ESR).

1.2 Operating temperature and life expectancy

(1) Expected life is affected by operating temperature. Generally, each 10 °C reduction in temperature will double the expected life. Use capacitors at the lowest possible temperature below the upper category temperature.

(2) If operating temperatures exceed the upper category limit, rapid deterioration of electrical parameter will occur and irreversible damage will result.

Measure not only the ambient temperature but also the surface temperature of the capacitor's case top, which has effects of ripple current and radiated heat from power transistors, IC's, and/or resistors.

Avoid placing components, which could conduct heat to the capacitor from the back side of the circuit board.

(3) A formula for calculating expected life is as follows ;

$$L_2 = L_1 \times 2^{\frac{T_1 - T_2}{10}} \quad \text{where } T_1 \geq T_2$$

L₁ : Guaranteed life (h) at temperature, T₁ °C

L₂ : Expected life (h) at temperature, T₂ °C

T₁ : Upper category temperature (°C) for the series, GA-A, M-A, and SU-A

Upper category temperature + temperature rise due to rated ripple current (°C) for the other series

T₂ : Actual operating temperature, ambient temperature + temperature rise due to ripple current (°C)

(4) Using the capacitor beyond the rated lifetime will result in short circuit, electrolyte leak, vent open, and large deterioration of characteristics. The lifetime cannot exceed 15 years due to aging of sealing rubber.

1.3 Load conditions to avoid

The following load conditions will cause rapid deterioration of capacitor's electrical characteristics.

In addition, instantaneous heating and gas generation within the capacitor may cause an operation of pressure relief vent, and that results in electrolyte leaks, explosion and/or fire ignition.

The leaked electrolyte is combustible and electrically conductive.

1.3-1 Reverse voltage

DC capacitors have polarity. Therefore, do not apply the reverse voltage. Find the correct polarity before insertion.

1.3-2 Charge / Discharge applications

General purpose capacitors are not suitable for use in repeating charge/discharge applications.

For such applications, consult a sales representative with actual application condition. Rush current must not exceed 100 A.

1.3-3 ON-OFF circuit

When using capacitors in circuit where ON-OFF switching is repeated more than 10,000 times a day, consult a sales representative with actual application condition for an appropriate choice of capacitors.

1.3-4 Over voltage

Do not apply a voltage exceeding the rated voltage. The rated surge voltage can be applied only for a short time. Make sure that a sum of the DC voltage and the superimposed AC ripple voltage does not exceed the rated voltage.

1.3-5 Ripple current

Do not apply ripple currents exceeding the rated value.

Make sure that rated ripple currents superimposed on low DC bias voltages do not cause reverse voltage conditions. Even if the current is below the rated ripple current, using the capacitor for longer than the rated lifetime will cause ESR increase and internal generation of heat, which may eventually lead to vent open, bulging of case/rubber, electrolyte leak, short circuit, explosion, or ignition in the worst case.

1.4 Connections in series or parallel

1.4-1 Capacitors connected in parallel

Because the impedance of the capacitor and PCB's wiring are very close, various impedance values may cause unbalanced ripple current loads among parallel capacitors. Combine the same part number and wire them carefully to minimize the potential risk of an excessive ripple current concentrating to one capacitor of the smallest impedance.

1.4-2 Capacitors connected in series

Voltage being applied to each capacitor must be smaller than the rated voltage. Unbalanced voltages to the series capacitors may exceed the rated voltage. Voltage-divider resistors considering leakage currents could prevent the over-voltage to the series capacitors. Conductive polymer hybrid aluminum electrolytic capacitors are not allowed to be connected in series.

1.5 Capacitor mounting considerations

- (1) For double sided circuit boards, avoid wiring patterns passing between the mounted capacitor and the circuit board. When a radial lead type capacitor is dipped into a solder bath, an excess solder may deposit under the capacitor by capillary action, causing short circuit between anode and cathode terminals. Also, lead holes must be placed with special care for radial lead type capacitors because laminate on capacitor's surface may become damaged during flow process.
- (2) The pitch between circuit board holes should match the lead wire pitch of the radial lead type capacitors within the specified tolerances. Unmatched pitch may cause an excessive stress on lead wires during the insertion process and result in short/open circuit, increased leakage current, or electrolyte leak.
- (3) Clearance for case mounted pressure relief
Capacitors with case mounted pressure relief require sufficient clearance to allow for proper pressure relief operation. The minimum clearance are dependent on capacitor diameters as follows.
(\varnothing 10 mm to \varnothing 16 mm: 2 mm minimum, \varnothing 18 mm: 3 mm minimum)
- (4) Wiring near the pressure relief
Avoid locating high voltage or high current wiring or circuit board paths above the pressure relief. Flammable, high temperature gas that exceeds 100 °C may be released which could dissolve the wire insulation and ignite.
- (5) Circuit board patterns under the capacitor
Avoid circuit board runs under the capacitor, as an electrical short can occur due to an electrolyte leakage.
- (6) Resonant vibration after circuit board's production may make a heavy load on the capacitor and cause rapid change in characteristics and/or capacitor's break.

1.6 Electrical isolation

Electrically isolate the capacitor's case from cathode terminals, as well as circuit patterns.

1.7 Capacitor sleeve and coating

The vinyl sleeve or laminate coating is intended for marking and identification purposes and is not meant to electrically insulate the capacitor.

The sleeve may split or crack if immersed into solvents such as toluene or xylene and then subsequently exposed to high temperatures.

2. Capacitor handling techniques

2.1 Considerations before using

- (1) Capacitors have a finite life. Do not reuse or recycle capacitors from used equipment.
- (2) Transient recovery voltage may be generated in the capacitor due to dielectric absorption.
If required, this voltage can be discharged with a resistor with a value of about 1 k Ω .
- (3) Capacitors stored for a long period of time may exhibit an increase in leakage current.
This can be corrected by gradually applying rated voltage in series with a resistor of approximately 1 k Ω .
- (4) If capacitors are dropped, they can be damaged mechanically or electrically. Avoid using dropped capacitors.
- (5) Dented or crushed capacitors should not be used.
The seal integrity can be damaged and loss of electrolyte/ shortened life can result.

2.2 Capacitor insertion

- (1) Verify the correct capacitance and rated voltage of the capacitor.
- (2) Verify the correct polarity of the capacitor before insertion.
- (3) Verify the correct terminal dimension and land pattern size for surface mount type, or holes' pitch for radial lead type before mount to avoid short circuit, stress on the terminals, and/or lack of terminal strength.
- (4) Excessive mounting pressure can cause high leakage current, short circuit, or disconnection.
- (5) When using a mounter for radial lead type, avoid cutter wear and acute angle of lead-bending with respect to circuit board. That may create excessive stress and pull the lead to damage the capacitor.

2.3 Reflow soldering (for surface mount type)

- (1) Surface-mount type capacitor are exclusively for reflow soldering.
When reflow solder is used an ambient heat condition system such as the simultaneous use of infrared and hot-air is recommended.
- (2) Observe proper soldering conditions (temperature, time, etc.). Do not exceed the specified limits.
If the peak temperature is high or if the heating time is long, it may cause deterioration of the electrical characteristics and life characteristics.
Recommended soldering condition is a guideline for ensuring the basic characteristics of the components, but not for the stable soldering conditions. Conditions for proper soldering should be set up according to individual conditions.
 - The Temperature on Capacitor top shall be measured by using thermal couple that is fixed firmly by epoxy glue.
- (3) In case of use in 2 times reflow, 2nd reflow must be done when the capacitor's temperature return back to normal level.
- (4) In our recommended reflow condition , the case discoloration and the case swelling might be slightly generated. But please acknowledge that these two phenomena do not influence the reliability of the product.
- (5) The crack on top marking might be occurred by reflow heat stress.
But please acknowledge that it does not influence the reliability of the product.
- (6) VPS (Vapor Phase Soldering) reflow can cause significant characteristics change and/ or mounting failure due to deformation by acute temperature rise.
VPS is acceptable provided that the process does not exceed recommended reflow profile and temperature rise is less than 3 °C/sec.
Please contact Panasonic for detailed conditions.
- (7) The vibration-proof capacitors of size ø6.3 has support terminals extending from the bottom side to the lead edge.
Then, make sure to find appropriate soldering conditions to form fillet on the support terminals if required for appearance inspection. However, even if sufficient solder fillets are not observed, the reliability of vibration-proof will not be lowered because the support terminals on the bottom side enhance the solder joint to PCB.

2.4 Flow soldering (for radial lead type)

- (1) Radial lead type capacitors cannot apply to reflow soldering.
- (2) Do not immerse the capacitor body into the solder bath as excessive internal pressure could result.
- (3) Apply proper soldering conditions (temperature, time, etc.). Do not exceed the specified limits.
- (4) Do not allow other parts or components to touch the capacitor during soldering.

2.5 Manual soldering

- (1) Apply soldering conditions (temperature and time) based on the specification, or do not exceed temperature of 350 °C for 3 seconds.
- (2) If a soldered capacitor must be removed and reinserted, avoid excessive stress on the capacitor leads.
- (3) Avoid physical contacts between the tip of the soldering iron and capacitors to prevent or capacitor failure.
- (4) When bending lead wires of radial type capacitors to match the hole pitch on PCB, avoid applying excessive stress to the capacitor body.

2.6 Other soldering considerations

Rapid temperature rise during the preheat operation and resin bonding operation can cause cracking of the capacitor's vinyl sleeve. For heat curing, do not exceed 150 °C for the maximum time of 2 minutes.

2.7 Capacitor handling after soldering

- (1) Avoid moving the capacitor after soldering to prevent excessive stress on the lead wires where they enter the seal. The capacitor may break from element portion due to a torque at outer rim, causing a large stress to terminals.
- (2) Do not use the capacitor as a handle when moving the circuit board assembly. The total weight of the board would apply to element portion through terminals, and the capacitor may break.
- (3) Avoid striking the capacitor after assembly to prevent failure due to excessive shock. The capacitor may break due to excessive shock or load above specified range.

2.8 Circuit board cleaning

- (1) Circuit boards can be immersed or ultrasonically cleaned using suitable cleaning solvents for up to 5 minutes and up to 60 °C maximum temperatures. The boards should be thoroughly rinsed and dried.

The use of ozone depleting cleaning agents is not recommended for the purpose of protecting our environment.

[Target solvent]

Pine Alpha ST-100S, Aqua Cleaner 210SEP, Clean-thru 750H / 750L / 710M, Sunelec B-12, Sunelec B-12, Cold Cleaner P3-375, Techno Cleaner 219, DK Be-clear CW-5790, Telpene Cleaner EC-7R, Technocare FRW-17 / FRW-1 / FRV-1

- (2) Avoid using the following solvent groups unless specifically allowed in the specification ;
- (a) Halogenated based solvents : may permeate the seal and cause internal corrosion.
Especially, 1-1-1 trichloroethane must not be used on any aluminum electrolytic capacitors.
 - (b) Alkaline based solvents : may dissolve and react to the aluminum case.
 - (c) Petroleum based solvents : may deteriorate the sealing rubber.
 - (d) Xylene : may deteriorate the sealing rubber.
 - (e) Acetone : may erase the markings.
- (3) A thorough drying after cleaning is required to remove residual cleaning solvents that may be trapped between the capacitor and the circuit board. Avoid drying temperatures, which exceed the upper category temperature of the capacitor.
- (4) Monitor the contamination levels of the cleaning solvents during use in terms of electrical conductivity, pH, specific gravity, and water content. Inside the capacitor may corrode with high density of chlorine. Control the flux density in the cleaning agent to be less than 2 mass%.
- (5) Depending on the cleaning method, the marking on a capacitor may be erased or blurred.

※ Please consult us if you are not certain about acceptable cleaning solvents or cleaning methods.

2.9 Mounting adhesives and coating agents

When using mounting adhesives or coating agents to control humidity, avoid using materials containing halogenated solvents. Also, avoid the use of chloroprene based polymers.

Cure or dry out the coating agents thoroughly, and do not leave any solvents. Make sure to dry out cleaning agents completely immediately after washing the circuit board if the capacitors are mounted afterward, so that the solvents are not left under the capacitor body. Also, leave more than 1/3 of the sealing portion open, and do not cover that portion with any adhesives or coating.

2.10 Potting and molding

Potting and molding processes cannot be recommended. They have potential risks to change the capacitor's performance and reliability due to injection pressure, diffused material into the capacitor, as well as heat accumulation by covered resin. Also, evaporated electrolyte may remain inside the resin, then turn to liquid, and possibly short circuit PCB patterns.

2.11 Fumigation

In exporting electronic appliances with aluminum electrolytic capacitors, in some cases fumigation treatment using such halogen compound as methyl bromide is conducted for wooden boxes.

If such boxes are not dried well, the halogen left in the box is dispersed while transported and enters in the capacitors inside. This possibly causes electrical corrosion of the capacitors. Therefore, after performing fumigation and drying make sure that no halogen is left. Don't perform fumigation treatment to the whole electronic appliances packed in a box.

2.12 Flux

If you use a halogen type (Chlorine type, Bromine type, etc.) high-activity flux, please use it after confirmation in advance, as it may have an impact on performance and reliability of this product due to the residue of the flux.

3. Precautions for using capacitors

3.1 Environmental conditions

Capacitors should not be stored or used in the following environments.

- (1) Exposure to temperatures above the upper category or below the lower category temperature of the capacitor.
- (2) Direct contact with water, salt water, or oil.
- (3) High humidity conditions where water could condense on the capacitor.
- (4) Exposure to toxic gases such as hydrogen sulfide, sulfuric acid, nitric acid, chlorine, chlorine compound, bromine, bromine compound or ammonia.
- (5) Exposure to ozone, radiation, or ultraviolet rays.
- (6) Vibration and shock conditions exceeding specified requirements.

Even within the specified requirements, a large vibration acceleration may be applied due to resonance, so be sure to evaluate and confirm with the actual product.

3.2 Electrical precautions

- (1) Avoid touching the terminals of a capacitor as a possible electric shock could result. The exposed aluminum case is not insulated and could also cause electric shock if touched.
- (2) Avoid short circuiting the capacitor terminals with conductive materials such as acids or alkaline solutions.
- (3) Electrical characteristics may largely change if a silicon material with low molecular-weight siloxane is used near the capacitor.

4. Emergency procedures

- (1) If the pressure relief of the capacitor operates, immediately turn off the equipment and disconnect from the power source. This will minimize an additional damage caused by the vaporizing electrolyte.
- (2) Avoid contact with the escaping electrolyte gas, which can exceed 100 °C temperatures.
If electrolyte or gas enters the eye, immediately flush the eye with large amounts of water.
If electrolyte or gas is ingested by mouth, gargle with water.
If electrolyte contacts the skin, wash with soap and water.

5. Long term storage

- (1) Leakage current of a capacitor tends to increase after a long-term storage due to dielectric dissolution, and very high current may flow at the first voltage load. However, applying voltage will form the dielectric, and the leakage current will decrease. Expiration date is 42 months from outgoing inspection date for part numbers listed below, and it is 12 month for part numbers not listed below.

Series	Expiration date
FC-A, FK-A, HD-A, TA-A, TP-A	42 months from outgoing inspection date

Storage condition is to keep in room temperature (5 °C to 35 °C) and humidity (45 % to 85 %) with no direct sunshine.

(2) Environmental Conditions

Do not store under condition outside the area described in the specification, and also under conditions listed below.

- (a) Exposure to temperatures above the upper category or below the lower category temperature of the capacitor.
- (b) Direct contact with water, salt water, or oil.
- (c) High humidity conditions where water could condense on the capacitor.
- (d) Exposure to toxic gases such as hydrogen sulfide, sulfuric acid, nitric acid, chlorine, Chlorine compound, Bromine, Bromine compound or ammonia.
- (e) Exposure to ozone, radiation, or ultraviolet rays.
- (f) Vibration and shock conditions exceeding specified requirements.

6. Capacitor disposal

When disposing capacitors, use one of the following methods.

- (1) Incinerate after crushing the capacitor or puncturing the can wall (to prevent explosion due to internal pressure rise).
- (2) Dispose as solid waste.

NOTE : Local laws may have specific disposal requirements which must be followed.


The precautions in using aluminum electrolytic capacitors follow the "Safety application guide for the use in fixed aluminum electrolytic capacitors for electronic equipment", RCR-2367D issued by JEITA in October 2017.
Please refer to the above application guide for details.

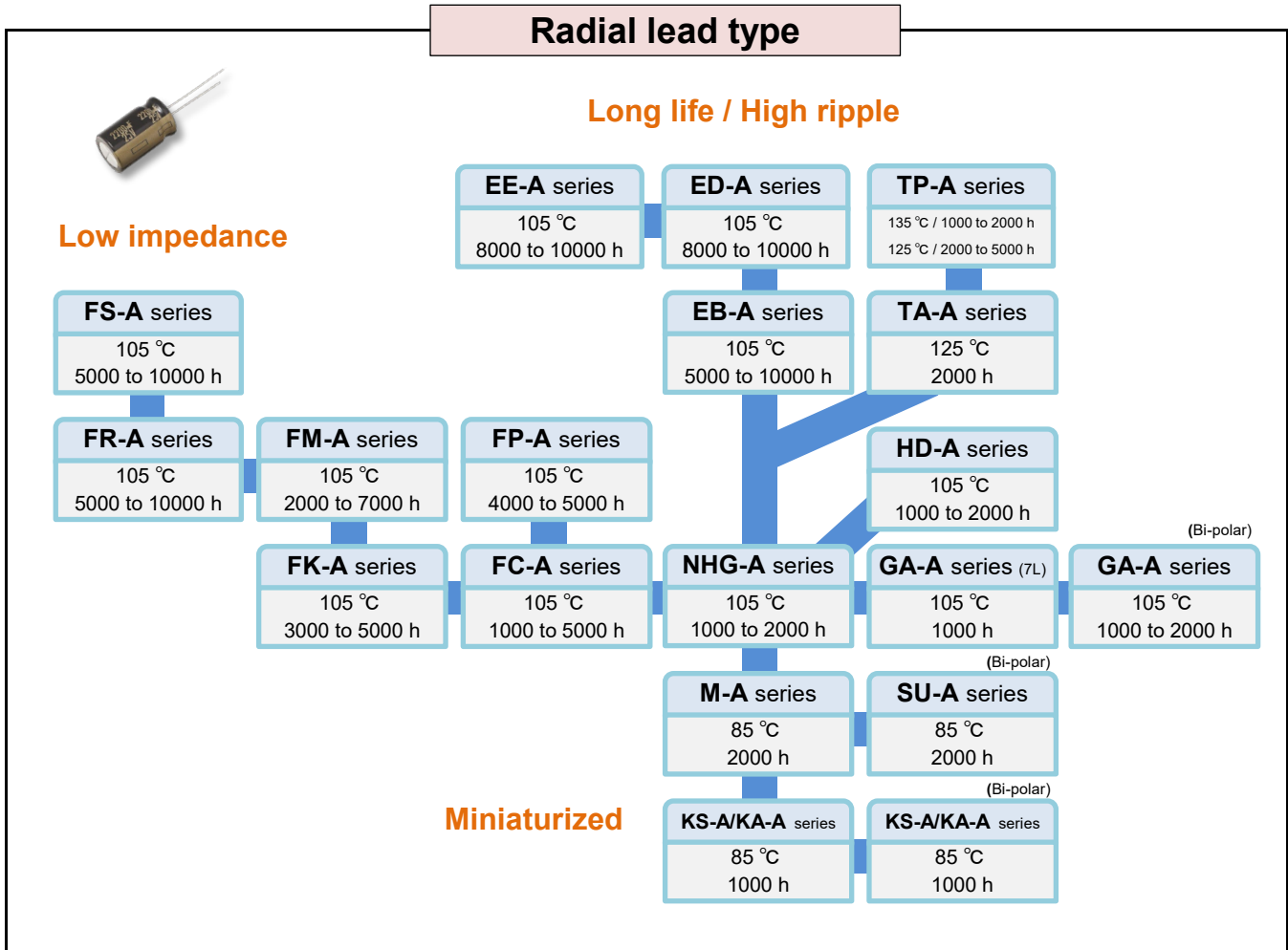
7. AEC-Q200 compliant

The products are tested based on all or part of the test conditions and methods defined in AEC-Q200.

Please consult with Panasonic for the details of the product specification and specific evaluation test results, etc., make sure to exchange product specifications for each product when placing an order.

Diagram

 This Series is no longer available for purchase in the country of Japan.



Explanation of part numbers

Part number system

◇ **Type 1 (Series : FC-A, FK-A, FM-A, FR-A, FS-A, FP-A, EB-A, ED-A, EE-A, TA-A, TP-A, HD-A, GA-A)**

EEU	FC	0J	272	□+B
Product classification 3 figures	Series code 2 figures	Voltage code 2 figures	Capacitance code 3 figures	Suffix+Taping of forming of terminal code 0 to 2 figures

Series		Code		R.voltage (V)	Code	Cap. (μF)	Code	Cap. (μF)	Code
FC-A (105 °C 1000 h to 5000 h)	FC	6.3	0J	1.5	1R5	390	391		
FK-A (105 °C 4000 h to 5000 h)	FK	10	1A	2.2	2R2	470	471		
FM-A (105 °C 4000 h to 7000 h)	FM	16	1C	3.3	3R3	510	511		
FR-A (105 °C 5000 h to 10000 h)	FR	25	1E	4.7	4R7	560	561		
FP-A (105 °C 4000 h to 5000 h)	FP	35	1V	5.6	5R6	680	681		
EB-A (105 °C 5000 h to 10000 h)	EB	50	1H	6.8	6R8	820	821		
ED-A (105 °C 8000 h to 10000 h)	ED	63	1J	10	100	1000	102		
EE-A (105 °C 8000 h to 10000 h)	EE	100	2A	12	120	1200	122		
TA-A (125 °C 2000 h)	TA	160	2C	15	150	1500	152		
TP-A (125 °C 3000 h to 5000 h)	TP	200	2D	18	180	1600	162		
HD-A (105 °C 2000 h)	HD	250	2E	22	220	1800	182		
GA-A (105 °C 1000 h)	GA	350	2V	27	270	2000	202		
		400	2G	33	330	2200	222		
		450	2W	39	390	2700	272		
				47	470	3300	332		
				56	560	3900	392		
				68	680	4700	472		
				82	820	5100	512		
				100	101	5600	562		
				120	121	6800	682		
				150	151	8200	822		
				180	181	10000	103		
				220	221	12000	123		
				270	271	15000	153		
				330	331	22000	223		

Taping of forming of terminal code	
* Blank	: Straight
* E	: Lead forming
* B	: Taping (Pitch 5.0, 7.5 mm)
* H	: Taping (Pitch 2.5 mm)

◇ **Type 2 (Series : NHG-A, GA-A Bipolar, M-A)**

ECA	0J	HG	101	□+B
Product classification 3 figures	Voltage code 2 figures	Series code 1 to 2 figures	Capacitance code 3 figures	Suffix+Taping of forming of terminal code 0 to 3 figures

R.voltage (V)	Code	Series	Code	Cap. (μF)	Code	Cap. (μF)	Code
6.3	0J	NHG-A (105°C 1000 h to 2000 h)	HG	1.5	1R5	330	331
10	1A	GA-A Bipolar (105°C 1000 h to 2000 h)	EN	2.2	2R2	470	471
16	1C	M-A (85°C 2000 h)	M	3.3	3R3	1000	102
25	1E			4.7	4R7	2200	222
35	1V			10	100	3300	332
50	1H			22	220	4700	472
63	1J			33	330	6800	682
100	2A			47	470	12000	123
160	2C			100	101	15000	153
200	2D			220	221	22000	223
250	2E						
350	2V						
400	2G						
450	2W						

Taping of forming of terminal code	
* Blank	: Straight
* E	: Lead forming
* B	: Taping (Pitch 5.0, 7.5 mm)
* i	: Taping (Pitch 2.5 mm)

◇ **Type 3 (Series : KA-A, KA-A Bipolar, KS-A, KS-A Bipolar, SU-A Bipolar)**

ECEA	0J	N	472	□+B
Product classification 4 figures	Voltage code 2 figures	Series code 1 to 2 figures	Capacitance code 3 figures	Suffix+Taping of forming of terminal code 0 to 1 figures

R.voltage (V)	Code	Series	Code	Cap. (μF)	Code	Cap. (μF)	Code
4	0D	KA-A (85°C 1000 h)	KA	2.2	2R2	220	221
6.3	0J	KA-A Bipolar (85°C 1000 h)	KN	3.3	3R3	330	331
10	1A	KS-A (85°C 1000 h)	KS	4.7	4R7	470	471
16	1C	KS-A Bipolar (85°C 1000 h)	SN	10	100	1000	102
25	1E	SU-A Bipolar (85°C 2000 h)	N	22	220	2200	222
35	1V			33	330	3300	332
50	1H			47	470	4700	472
				100	101	6800	682

Taping of forming of terminal code	
* Blank	: Straight
* E	: Lead forming
* B	: Taping (Pitch 5.0, 7.5 mm)
* i	: Taping (Pitch 2.5 mm)

Lead taping radial lead type

● Dimensions

Case size(mm) $\phi D \times L$	Lead space	2.5 mm	5.0 mm	7.5 mm
	Figure	Figure	Figure	Figure
4 × 5, 7	B	A	—	
5 × 5, 7	B	A	—	
6.3 × 5, 7	C	A	—	
8 × 5, 7	C	E	—	
5 × 11	C	D	—	
6.3 × 11.2, 15	C	D	—	

Case size(mm) $\phi D \times L$	Lead space	2.5 mm	5.0 mm	7.5 mm
	Figure	Figure	Figure	Figure
8 × 11.5, 15, 20	—	E	—	
10 × 12.5, 16, 20, 25	—	F	—	
12.5 × 15, 20, 25	—	G	—	
16 × 15, 20, 25	—	—	H	
18 × 15, 20, 25	—	—	H	

Figure A (Lead space : 5.0 mm / $\phi D \times L$: $\phi 4 \times 5, 7, \phi 5 \times 5, 7, \phi 6.3 \times 5, 7$)

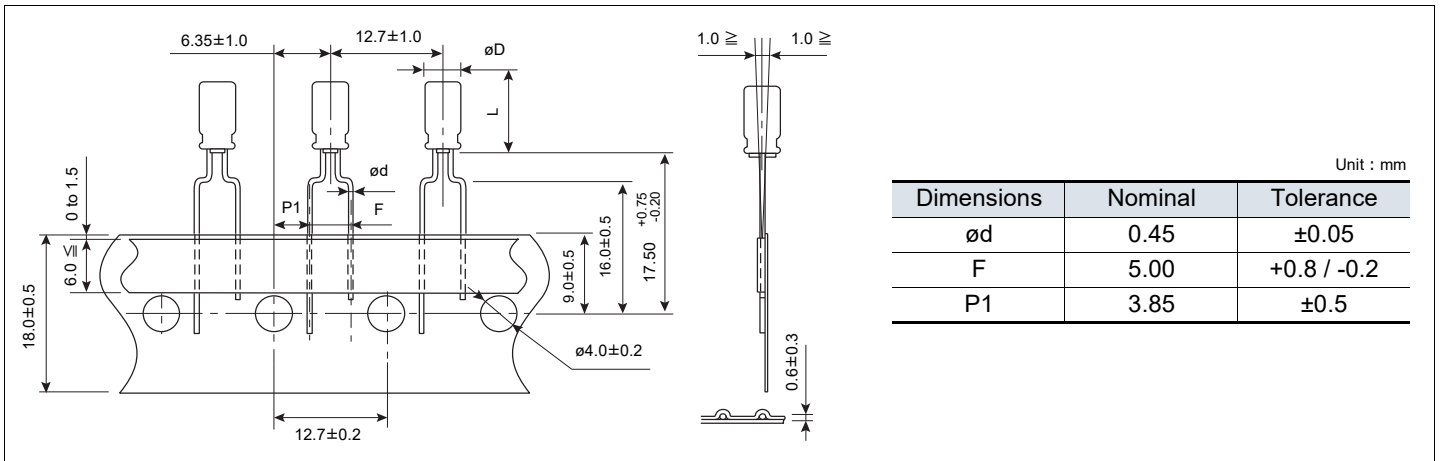


Figure B (Lead space : 2.5 mm / $\phi D \times L$: $\phi 4 \times 5, 7, \phi 5 \times 5, 7$)

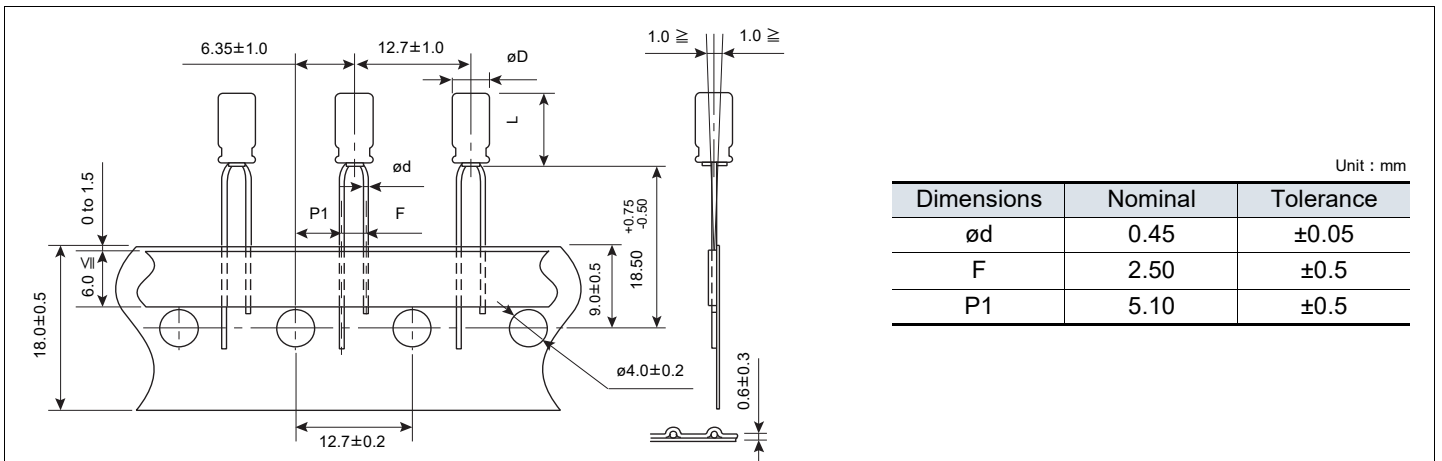


Figure C (Lead space : 2.5 mm / $\phi D \times L$: $\phi 5 \times 11, \phi 6.3 \times 5, 7, 11.2, 15, \phi 8 \times 5, 7$)

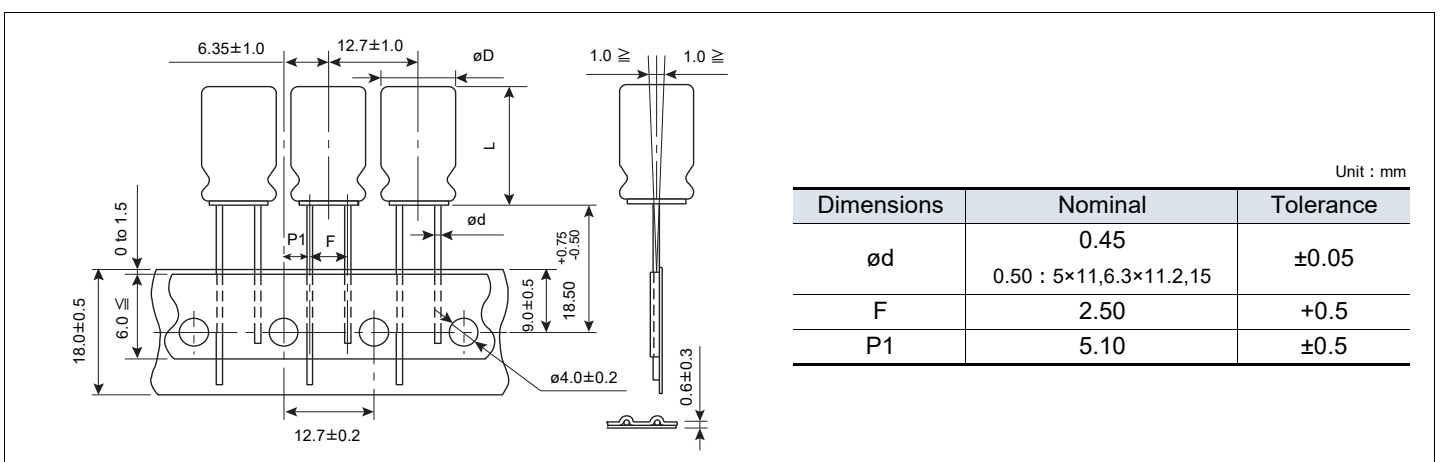


Figure D (Lead space : 5.0 mm / $\phi D \times L$: $\phi 5 \times 11, \phi 6.3 \times 11.2, 15$)

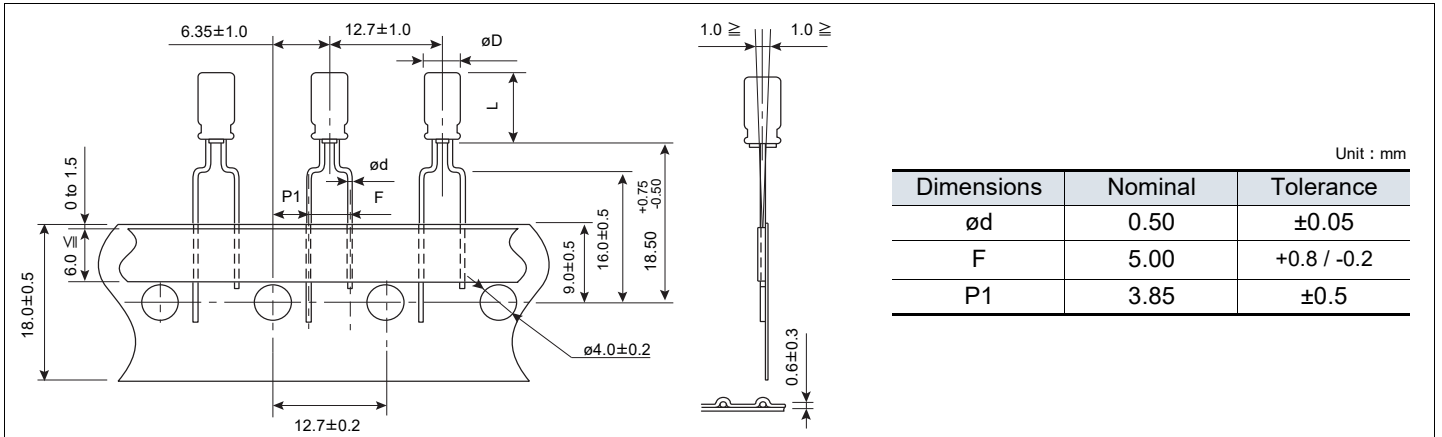


Figure E (Lead space : 5 mm / $\phi D \times L$: $\phi 8 \times 5, 7, 11.5, 15, 20$)

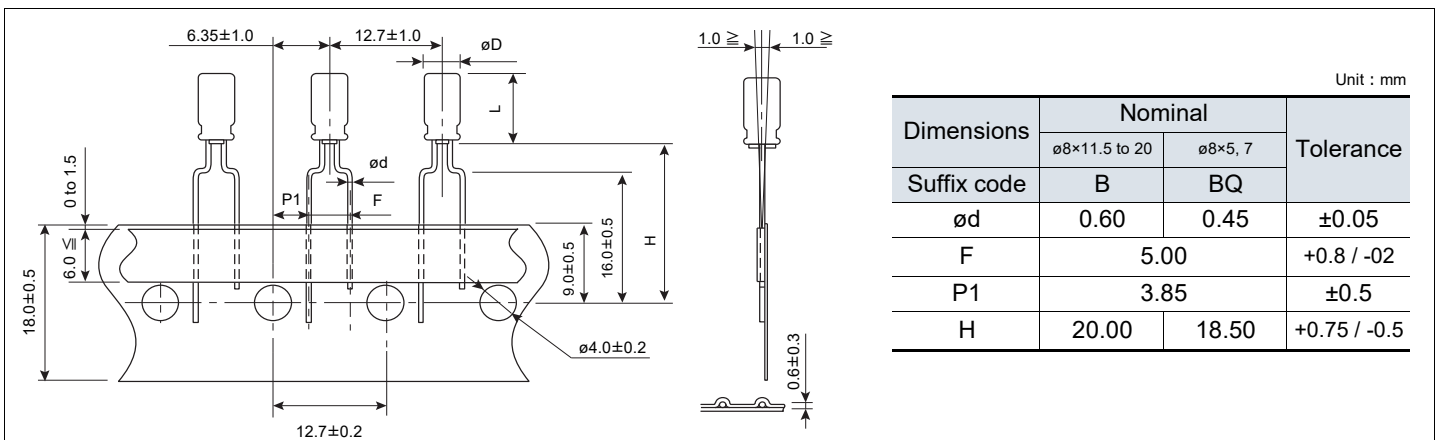


Figure F (Lead space : 5 mm / $\phi D \times L$: $\phi 10 \times 12.5, 16, 20, 25$)

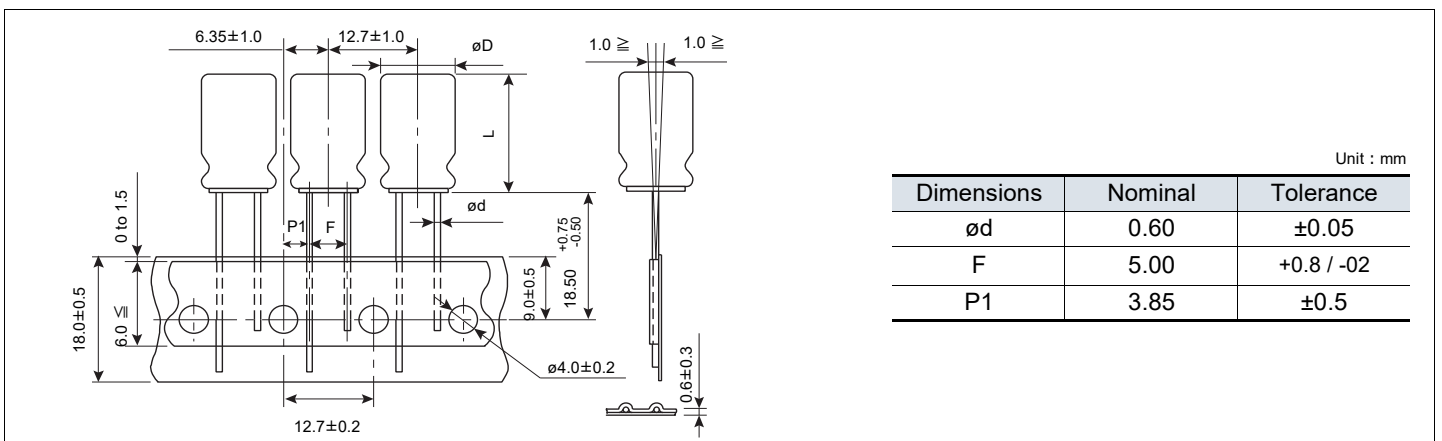


Figure G (Lead space : 5 mm / $\phi D \times L$: $\phi 12.5 \times 15, 20, 25$)

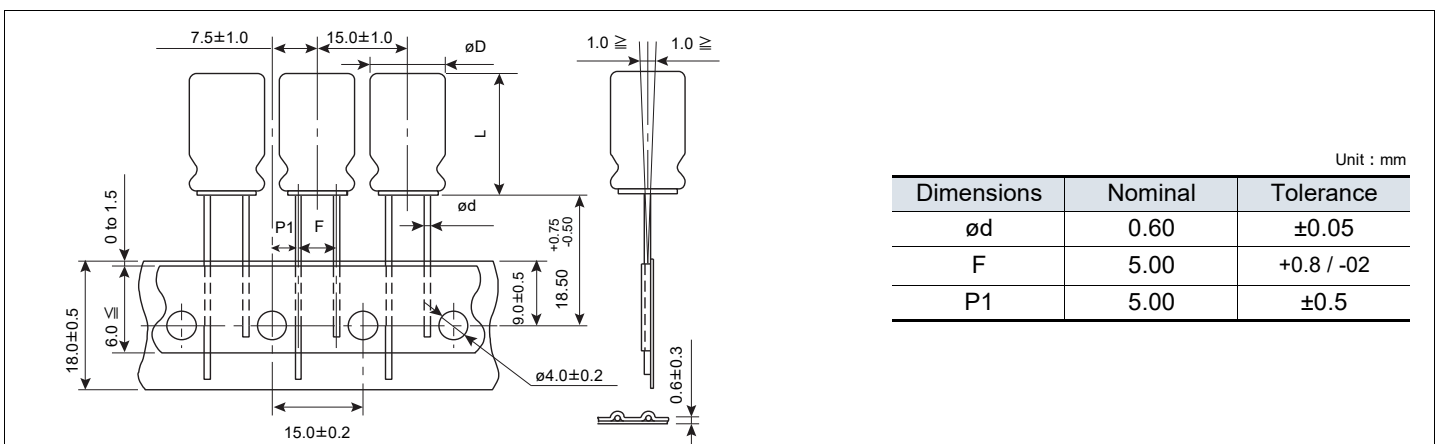
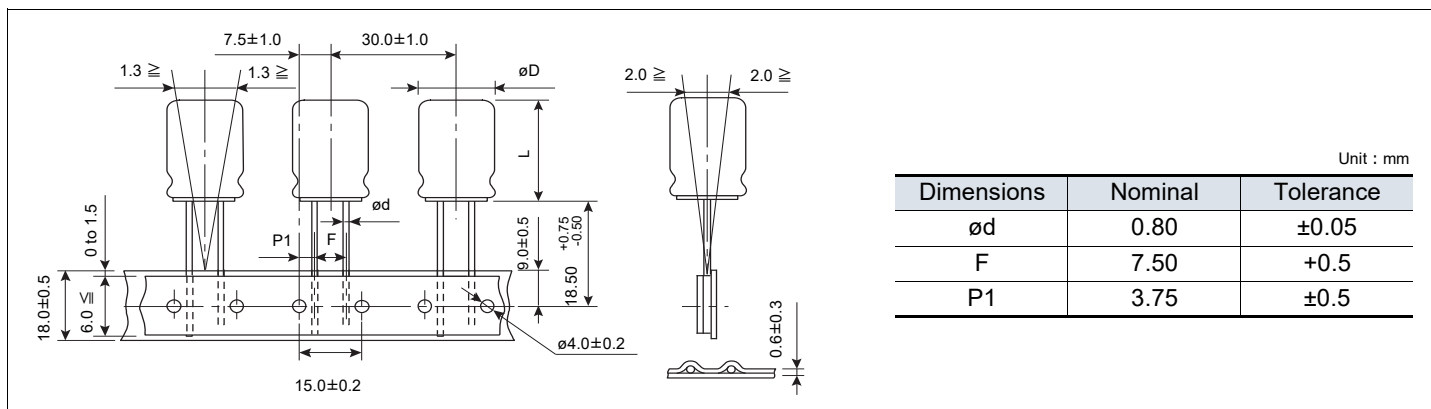


Figure H (Lead space : 7.5 mm / $\phi D \times L$: $\phi 16 \times 15, 20, 25, \phi 18 \times 15, 20, 25$)



Packaging Specifications

Dimensions of outer carton box		Dimensions				
		ø4 to ø5	ø6.3	ø8	ø10, ø12.5	ø16, ø18
a	340 max.	340 max.	340 max.	340 max.	340 max.	340 max.
b	to 55 max.	to 55 max.	to 55 max.	55 to 66 max.	62 to 75 max.	
c	170 to 210 max.	270 max.	230 max.	170 to 270 max.	225 to 310 max.	
Packaging Qty.	2000 pcs.	2000 pcs.	1000 pcs.	500 pcs.	250 pcs.	

Unit : mm

● Lead forming type (Snap-in)

Lead formed Aluminium Electrolytic Capacitor for self mounting, for rationalization and upgrade of soldering process.

Shape of lead wire

øD	Dimensions
4, 5, 6.3, 8	
10, 12.5, 16, 18	

Dimensions

øD	H1±0.5	H2	H3	F±0.5	P	E max.	ød	for PWB	
								hole dia. ø	thick ness
5.0	4.5	2.7	2.5	5.0	1.0	1.0	0.5	0.9	1.6
6.3	4.5	2.7	2.5	5.0	1.0	1.0	0.5	1.0	1.6
8.0	4.5	2.7	2.5	5.0	1.0	1.0	0.6	1.0	1.6
10.0	4.5	2.7	—	5.0	1.0	1.0	0.6	1.0	1.6
12.5	4.5	2.7	—	5.0	1.0 / 0.9	1.0	0.6 / 0.8	1.0 / 1.1	1.6
16.0	4.5	2.7	—	7.5	0.9	1.0	0.8	1.1	1.6
18.0	4.5	2.7	—	7.5	0.9	1.0	0.8	1.1	1.6

Unit : mm

Series KA/KS Dimensions

øD	H1±0.5	H2	H3±0.3	F±0.5	P	E max.	ød	for PWB	
								hole dia. ø	thick ness
4.0	4.5	2.7	1.5	5.0	0.95	1.0	0.45	0.9	1.6
5.0	4.5	2.7	1.5	5.0	0.95	1.0	0.45	0.9	1.6
6.3	4.5	2.7	1.5	5.0	0.95	1.0	0.45	0.9	1.6
8.0	4.5	2.7	1.5	5.0	0.95	1.0	0.45	0.9	1.6

Unit : mm

Aluminum Electrolytic Capacitors

Radial Lead Type

FR-A series



Features

- Endurance : 105 °C 5000 h to 10000 h
- Low ESR (Same as FM Series)
- RoHS compliant

Country of origin

- Malaysia

Specifications

Category temp. range	-40 °C to +105 °C									
Rated voltage range	6.3 V to 100 V									
Capacitance range	4.7 μF to 8200 μF									
Capacitance tolerance	±20 % (120 Hz / +20°C)									
Leakage current	$I \leq 0.01 CV (\mu A)$ After 2 minutes									
Dissipation factor (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	63	100	(120 Hz / +20°C)
	Dissipation factor (tan δ)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	
For capacitance value $\geq 1000 \mu F$, add 0.02 per every 1000 μF .										
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage) when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow. Duration $\phi 5 \times 11, \phi 6.3 \times 11.2$: 5000 h $\phi 8 \times 11.5, \phi 10 \times 12.5$: 6000 h (* Only EEUF1V331U ($\phi 10 \times 12.5$) 5000 h) $\phi 8 \times 15, \phi 10 \times 16$: 8000 h, $\phi 8 \times 20$: 9000 h $\phi 10 \times 20$ to $\phi 10 \times 25, \phi 12.5 \times 20$ to $\phi 12.5 \times 35, \phi 16 \times 20$ to $\phi 16 \times 25$: 10000 h									
	Capacitance change	Within ±25 % of the initial value (6.3 V to 10 V : ±30 %)								
	Dissipation factor (tan δ)	≤ 200 % of the initial limit								
	DC leakage current	Within the initial limit								
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)									

Frequency correction factor for ripple current

Freq. (Hz)	60	120	1 k	10 k	100 k
Cap. (μF)					
4.7 to 33	0.45	0.55	0.75	0.90	1.00
47 to 330	0.60	0.70	0.85	0.95	1.00
390 to 1000	0.65	0.75	0.90	0.98	1.00
1200 to 8200	0.75	0.80	0.95	1.00	1.00

Dimensions

Pressure relief $\phi 6.3 \leq$

Sleeve

$\phi d \pm 0.05$

14min. 3min.

$\phi 8$ $\phi 10 \leq$

$\phi D \pm 0.5$ $F \pm 0.5$ $\phi D \pm 0.5$

* $L \leq 16$: $L \pm 1.5$
 $L \geq 20$: $L \pm 2.0$

	Unit : mm							
ϕD	5.0	6.3	8.0	10.0	12.5		16.0	
L	—	—	—	—	12.5 to 25		30 to 35	—
ϕd	0.5	0.5	0.6	0.6	0.6	0.8	0.8	
F	2.0	2.5	3.5	5.0	5.0	5.0	7.5	

Case size / Impedance / Ripple current

R. voltage	6.3 V to 35 V			50 V		
	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)
	+20 °C	-10 °C	+105 °C	+20 °C	-10 °C	+105 °C
Case size (mm) (øD×L)						
5 × 11	0.300	1.000	280	0.340	1.130	250
6.3 × 11.2	0.130	0.430	455	0.140	0.460	405
8 × 11.5	0.056	0.168	950	0.061	0.183	870
8 × 15	0.041	0.123	1240	0.045	0.135	1140
8 × 20	0.030	0.090	1560	0.033	0.099	1430
10 × 12.5	0.043	0.114	1290	0.042	0.126	1170
10 × 16	0.028	0.078	1790	0.030	0.090	1650
10 × 20	0.020	0.057	2180	0.023	0.069	1890
10 × 25	0.018	0.054	2470	0.022	0.066	2150
12.5 × 20	0.018	0.045	2600	0.022	0.055	2260
12.5 × 25	0.015	0.038	3190	0.018	0.045	2660
12.5 × 30	0.013	0.033	3630	0.016	0.040	3160
12.5 × 35	0.012	0.030	3750	0.014	0.035	3270
16 × 20	0.017	0.043	3300	0.019	0.048	2870
16 × 25	0.014	0.035	3820	0.016	0.040	3320

R. voltage	63 V		
	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)
	+20 °C	-10 °C	+105 °C
Case size (mm) (øD×L)			
5 × 11	0.510	2.040	175
6.3 × 11.2	0.210	0.840	284
8 × 11.5	0.092	0.368	566
8 × 15	0.068	0.272	741
8 × 20	0.050	0.200	930
10 × 12.5	0.063	0.252	761
10 × 16	0.045	0.180	1073
10 × 20	0.035	0.140	1229
10 × 25	0.033	0.132	1500
12.5 × 20	0.033	0.125	1582
12.5 × 25	0.027	0.092	1995
12.5 × 30	0.024	0.082	2528
12.5 × 35	0.021	0.071	2780
16 × 20	0.029	0.093	2153
16 × 25	0.024	0.074	2988

R. voltage	100 V		
	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)
	+20 °C	-10 °C	+105 °C
Case size (mm) (øD×L)			
10 × 20	0.084	0.336	1500

*1: 100 kHz

Characteristics list

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impedance ^{*2} (Ω)	Endurance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
6.3	150	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFR0J151()	200	2000
	220	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFR0J221()	200	2000
	330	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFR0J331()	200	2000
	470	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFR0J471()	200	2000
	820	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFR0J821()	200	1000
	1000	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFR0J102()	200	1000
	1200	8.0	15.0	1240	0.041	8000	0.6	3.5	5.0	—	EEUFR0J122L()	200	1000
		10.0	12.5	1290	0.043	6000	0.6	5.0	5.0	—	EEUFR0J122()	200	500
	1500	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFR0J152L()	200	1000
	1800	10.0	16.0	1790	0.028	8000	0.6	5.0	5.0	—	EEUFR0J182()	200	500
	2200	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFR0J222()	200	500
	2700	10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFR0J272L()	200	500
	3300	10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFR0J332L()	200	500
	3900	12.5	20.0	2600	0.018	10000	0.6	5.0	5.0	—	EEUFR0J392()	200	500
	4700	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFR0J472()	200	500
	5600	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFR0J562L	100	—
	6800	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFR0J682L	100	—
16.0		20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFR0J682S()	100	250	
8200	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFR0J822()	100	250	
10	100	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFR1A101()	200	2000
	150	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFR1A151()	200	2000
	220	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFR1A221()	200	2000
	270	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFR1A271()	200	2000
	470	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFR1A471()	200	1000
	680	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFR1A681()	200	1000
	820	10.0	12.5	1290	0.043	6000	0.6	5.0	5.0	—	EEUFR1A821()	200	500
	1000	10.0	16.0	1790	0.028	8000	0.6	5.0	5.0	—	EEUFR1A102()	200	500
		8.0	15.0	1240	0.041	8000	0.6	3.5	5.0	—	EEUFR1A102L()	200	1000
	1500	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFR1A152L()	200	1000
		10.0	16.0	1790	0.028	8000	0.6	5.0	5.0	—	EEUFR1A152()	200	500
	1800	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFR1A182()	200	500
	2200	10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFR1A222L()	200	500
	3300	12.5	20.0	2600	0.018	10000	0.6	5.0	5.0	—	EEUFR1A332()	200	500
	3900	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFR1A392()	200	500
	4700	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFR1A472L	100	—
		16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFR1A472S()	100	250
5600	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFR1A562L	100	—	
6800	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFR1A682L	100	—	
	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFR1A682()	100	250	

*1: Ripple current (100 kHz / +105 °C)

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impe-dance ^{*2} (Ω)	Endu-rance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
16	68	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFR1C680()	200	2000
	100	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFR1C101()	200	2000
	120	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFR1C121()	200	2000
	220	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFR1C221()	200	2000
	470	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFR1C471()	200	1000
	680	8.0	15.0	1240	0.041	8000	0.6	3.5	5.0	—	EEUFR1C681L()	200	1000
		10.0	12.5	1290	0.043	6000	0.6	5.0	5.0	—	EEUFR1C681()	200	500
	1000	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFR1C102L()	200	1000
		10.0	16.0	1790	0.028	8000	0.6	5.0	5.0	—	EEUFR1C102()	200	500
	1500	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFR1C152()	200	500
		10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFR1C152L()	200	500
	1800	10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFR1C182L()	200	500
	2200	12.5	20.0	2600	0.018	10000	0.6	5.0	5.0	—	EEUFR1C222()	200	500
	2700	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFR1C272()	200	500
	3300	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFR1C332L	100	—
		16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFR1C332S()	100	250
	3900	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFR1C392L	100	—
		16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFR1C392S()	100	250
	4700	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFR1C472L	100	—
		16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFR1C472()	100	250
5600	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFR1C562()	100	250	
25	47	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFR1E470()	200	2000
	68	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFR1E680()	200	2000
	100	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFR1E101()	200	2000
	150	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFR1E151()	200	2000
	220	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFR1E221()	200	1000
	330	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFR1E331()	200	1000
	390	8.0	15.0	1240	0.041	8000	0.6	3.5	5.0	—	EEUFR1E391L()	200	1000
	470	8.0	15.0	1240	0.041	8000	0.6	3.5	5.0	—	EEUFR1E471Y()	200	1000
		8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFR1E471L()	200	1000
		10.0	12.5	1290	0.043	6000	0.6	5.0	5.0	—	EEUFR1E471()	200	500
	560	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFR1E561L()	200	1000
	680	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFR1E681L()	200	1000
		10.0	16.0	1790	0.028	8000	0.6	5.0	5.0	—	EEUFR1E681()	200	500
	820	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFR1E821()	200	500
	1000	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFR1E102()	200	500
		10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFR1E102L()	200	500
	1200	10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFR1E122L()	200	500
	1500	12.5	20.0	2600	0.018	10000	0.6	5.0	5.0	—	EEUFR1E152()	200	500
	1800	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFR1E182()	200	500
		16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFR1E182S()	100	250
2200	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFR1E222L	100	—	
	16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFR1E222S()	100	250	
2700	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFR1E272L	100	—	
	16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFR1E272S()	100	250	
3300	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFR1E332()	100	250	

*1: Ripple current (100 kHz / +105 °C)

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current ^{*1} (mA rms)	Impe- dance ^{*2} (Ω)	Endu- rance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping	
								Straight	Taping *B	Taping *H				
35	33	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFR1V330()	200	2000	
	68	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFR1V680()	200	2000	
	100	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFR1V101()	200	1000	
	180	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFR1V181()	200	1000	
	220	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFR1V221()	200	1000	
	270	8.0	15.0	1240	0.041	8000	0.6	3.5	5.0	—	EEUFR1V271L()	200	1000	
		10.0	12.5	1290	0.043	6000	0.6	5.0	5.0	—	EEUFR1V271()	200	500	
	330	10.0	12.5	1330	0.043	5000	0.6	5.0	5.0	—	EEUFR1V331U()	200	500	
	390	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFR1V391L()	200	1000	
	470	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFR1V471L()	200	1000	
		10.0	16.0	1790	0.028	8000	0.6	5.0	5.0	—	EEUFR1V471()	200	500	
	560	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFR1V561()	200	500	
	680	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFR1V681()	200	500	
		10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFR1V681L()	200	500	
	820	10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFR1V821L()	200	500	
	1000	12.5	20.0	2600	0.018	10000	0.6	5.0	5.0	—	EEUFR1V102()	200	500	
	1200	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFR1V122()	200	500	
	1500	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFR1V152L	100	—	
		16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFR1V152S()	100	250	
	1800	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFR1V182L	100	—	
16.0		25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFR1V182()	100	250		
2200	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFR1V222L	100	—		
	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFR1V222()	100	250		
50	4.7	5.0	11.0	185	0.620	5000	0.5	2.0	5.0	2.5	EEUFR1H4R7()	200	2000	
	10	5.0	11.0	250	0.340	5000	0.5	2.0	5.0	2.5	EEUFR1H100()	200	2000	
	22	5.0	11.0	250	0.340	5000	0.5	2.0	5.0	2.5	EEUFR1H220()	200	2000	
	47	6.3	11.2	405	0.140	5000	0.5	2.5	5.0	—	EEUFR1H470()	200	2000	
	56	6.3	11.2	405	0.140	5000	0.5	2.5	5.0	2.5	EEUFR1H560()	200	2000	
	100	8.0	11.5	870	0.061	6000	0.6	3.5	5.0	—	EEUFR1H101()	200	1000	
	120	8.0	15.0	1140	0.045	8000	0.6	3.5	5.0	—	EEUFR1H121L()	200	1000	
	150	10.0	12.5	1170	0.042	6000	0.6	5.0	5.0	—	EEUFR1H151()	200	500	
	180	8.0	20.0	1430	0.033	9000	0.6	3.5	5.0	—	EEUFR1H181L()	200	1000	
	220	10.0	16.0	1650	0.030	8000	0.6	5.0	5.0	—	EEUFR1H221()	200	500	
	270	10.0	20.0	1890	0.023	10000	0.6	5.0	5.0	—	EEUFR1H271()	200	500	
	330	10.0	25.0	2150	0.022	10000	0.6	5.0	5.0	—	EEUFR1H331L()	200	500	
	470	12.5	20.0	2260	0.022	10000	0.6	5.0	5.0	—	EEUFR1H471()	200	500	
	560	12.5	25.0	2660	0.018	10000	0.6	5.0	5.0	—	EEUFR1H561()	200	500	
	680	12.5	30.0	3160	0.016	10000	0.8	5.0	—	—	EEUFR1H681L	100	—	
		12.5	35.0	3270	0.014	10000	0.8	5.0	—	—	EEUFR1H821L	100	—	
	820	16.0	20.0	2870	0.019	10000	0.8	7.5	7.5	—	EEUFR1H821S()	100	250	
		16.0	25.0	3320	0.016	10000	0.8	7.5	7.5	—	EEUFR1H102()	100	250	
	63	18	5.0	11.0	175	0.510	5000	0.5	2.0	5.0	2.5	EEUFR1J180()	200	2000
		47	6.3	11.2	284	0.210	5000	0.5	2.5	5.0	2.5	EEUFR1J470()	200	2000
82		8.0	11.5	566	0.092	6000	0.6	3.5	5.0	—	EEUFR1J820()	200	1000	
100		8.0	15.0	741	0.068	8000	0.6	3.5	5.0	—	EEUFR1J101L()	200	1000	
		10.0	12.5	761	0.063	6000	0.6	5.0	5.0	—	EEUFR1J101()	200	500	
120		8.0	20.0	930	0.050	9000	0.6	3.5	5.0	—	EEUFR1J121L()	200	1000	
		10.0	16.0	1073	0.045	8000	0.6	5.0	5.0	—	EEUFR1J121()	200	500	
150		8.0	20.0	930	0.050	9000	0.6	3.5	5.0	—	EEUFR1J151L()	200	1000	
		10.0	16.0	1073	0.045	8000	0.6	5.0	5.0	—	EEUFR1J151()	200	500	
180		10.0	20.0	1229	0.035	10000	0.6	5.0	5.0	—	EEUFR1J181()	200	500	
220		10.0	25.0	1500	0.033	10000	0.6	5.0	5.0	—	EEUFR1J221L()	200	500	
		10.0	20.0	1229	0.035	10000	0.6	5.0	5.0	—	EEUFR1J271U()	200	500	
270		10.0	25.0	1500	0.033	10000	0.6	5.0	5.0	—	EEUFR1J271L()	200	500	
		12.5	20.0	1582	0.033	10000	0.6	5.0	5.0	—	EEUFR1J271()	200	500	
330		12.5	20.0	1582	0.033	10000	0.6	5.0	5.0	—	EEUFR1J331()	200	500	
390		12.5	25.0	1995	0.027	10000	0.6	5.0	5.0	—	EEUFR1J391()	200	500	
470		12.5	25.0	1995	0.027	10000	0.6	5.0	5.0	—	EEUFR1J471()	200	500	
560		12.5	30.0	2528	0.024	10000	0.8	5.0	—	—	EEUFR1J561L	100	—	
		16.0	20.0	2153	0.029	10000	0.8	7.5	7.5	—	EEUFR1J561S()	100	250	
680		12.5	35.0	2780	0.021	10000	0.8	5.0	—	—	EEUFR1J681L	100	—	
820	16.0	25.0	2988	0.024	10000	0.8	7.5	7.5	—	EEUFR1J821()	100	250		
100	100	10.0	20.0	1500	0.084	10000	0.6	5.0	5.0	—	EEUFR2A101()	200	500	

*1: Ripple current (100 kHz / +105 °C)

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Aluminum Electrolytic Capacitors

Radial Lead Type

FS-A series



Features

- Endurance : 105 °C 5000 h to 10000 h
- Low ESR, Miniaturized (1 size smaller than series FR)
- RoHS compliant

Country of origin

- Malaysia

Specifications

Category temp. range	-40 °C to +105 °C										
Rated voltage range	6.3 V to 100 V										
Capacitance range	27 µF to 10000 µF										
Capacitance tolerance	±20 % (120 Hz / +20°C)										
Leakage current	$I \leq 0.01 CV (\mu A)$ After 2 minutes										
Dissipation factor (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	63	80	100	(120 Hz / +20°C)
	Dissipation factor (tan δ)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.08	
For capacitance value $\geq 1000 \mu F$, add 0.02 per every 1000 µF.											
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage) when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow.										
	Duration										
	$\varnothing 5 \times 11, \varnothing 6.3 \times 11.2$: 5000 h $\varnothing 8 \times 11.5, \varnothing 10 \times 12.5$: 6000 h $\varnothing 8 \times 15, \varnothing 10 \times 16$: 8000 h, $\varnothing 8 \times 20$: 9000 h $\varnothing 10 \times 20$ to $\varnothing 10 \times 25, \varnothing 12.5 \times 20$ to $\varnothing 12.5 \times 35, \varnothing 16 \times 20$ to $\varnothing 16 \times 25$: 10000 h										
	Capacitance change	Within ±25 % of the initial value (6.3 V to 10 V : ±30 %)									
Shelf life	Dissipation factor (tan δ)	≤ 200 % of the initial limit									
	DC leakage current	Within the initial limit									
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance.										
	(With voltage treatment)										

Frequency correction factor for ripple current

Freq. (Hz)	60	120	1 k	10 k	100 k to
27 to 33	0.45	0.55	0.75	0.90	1.00
47 to 330	0.60	0.70	0.85	0.95	1.00
390 to 1000	0.65	0.75	0.90	0.98	1.00
1200 to 10000	0.75	0.80	0.95	1.00	1.00

Dimensions

* $L \leq 16$: $L \pm 1.5$
 $L \geq 20$: $L \pm 2.0$

	Unit : mm						
øD	5.0	6.3	8.0	10.0	12.5		16.0
L	—	—	—	—	12.5 to 25		30 to 35
ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	5.0	7.5

Case size / Impedance / Ripple current

R. voltage	6.3 V to 35 V			50 V		
	Impedance* ¹ (Ω)		Ripple current* ¹ (mA rms)	Impedance* ¹ (Ω)		Ripple current* ¹ (mA rms)
	+20 °C	-10 °C	+105 °C	+20 °C	-10 °C	+105 °C
Case size (mm) (øD×L)						
5 × 11	0.300	1.000	280	0.340	1.130	250
6.3 × 11.2	0.130	0.430	455	—	—	—
8 × 11.5	0.056	0.168	950	—	—	—
8 × 15	0.041	0.123	1240	0.045	0.135	1140
8 × 20	0.030	0.090	1560	0.033	0.099	1430
10 × 12.5	0.043	0.114	1290	—	—	—
10 × 16	0.028	0.078	1790	—	—	—
10 × 20	0.020	0.057	2180	0.023	0.069	1890
10 × 25	0.018	0.054	2470	0.022	0.066	2150
12.5 × 20	0.018	0.045	2600	—	—	—
12.5 × 25	0.015	0.038	3190	0.018	0.045	2660
12.5 × 30	0.013	0.033	3630	0.016	0.040	3160
12.5 × 35	0.012	0.030	3750	0.014	0.035	3270
16 × 20	0.017	0.043	3300	—	—	—
16 × 25	0.014	0.035	3820	0.016	0.040	3320

R. voltage	63 V			80 V to 100 V		
	Impedance* ¹ (Ω)		Ripple current* ¹ (mA rms)	Impedance* ¹ (Ω)		Ripple current* ¹ (mA rms)
	+20 °C	-10 °C	+105 °C	+20 °C	-10 °C	+105 °C
Case size (mm) (øD×L)						
5 × 11	0.510	2.040	175	—	—	—
6.3 × 11.2	—	—	—	—	—	—
8 × 11.5	—	—	—	0.160	0.720	490
8 × 15	0.068	0.272	741	0.112	0.504	590
8 × 20	0.050	0.200	930	0.096	0.432	810
10 × 12.5	0.063	0.252	761	0.112	0.448	600
10 × 16	0.045	0.180	1073	0.072	0.288	930
10 × 20	—	—	—	0.054	0.224	1120
10 × 25	0.033	0.132	1500	0.044	0.176	1200
12.5 × 20	0.033	0.125	1582	0.043	0.135	1400
12.5 × 25	0.027	0.092	1995	0.034	0.108	1800
12.5 × 30	—	—	—	0.030	0.099	2200
12.5 × 35	0.021	0.071	2780	0.023	0.070	2380
16 × 20	0.029	0.093	2153	0.032	0.108	1450
16 × 25	0.024	0.074	2988	0.025	0.076	2500

*1: 100 kHz

Characteristics list

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impe-dance ^{*2} (Ω)	Endu-rance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
6.3	220	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFS0J221()	200	2000
	1500	8.0	15.0	1240	0.041	8000	0.6	3.5	5.0	—	EEUFS0J152L()	200	1000
		10.0	12.5	1290	0.043	6000	0.6	5.0	5.0	—	EEUFS0J152()	200	500
	1800	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFS0J182L()	200	1000
	2000	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFS0J202L()	200	1000
		10.0	16.0	1790	0.028	8000	0.6	5.0	5.0	—	EEUFS0J202()	200	500
	2200	10.0	16.0	1790	0.028	8000	0.6	5.0	5.0	—	EEUFS0J222()	200	500
	2700	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFS0J272()	200	500
	3300	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFS0J332()	200	500
	3900	10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFS0J392L()	200	500
	4700	12.5	20.0	2600	0.018	10000	0.6	5.0	5.0	—	EEUFS0J472()	200	500
	5100	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFS0J512()	200	500
	5600	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFS0J562()	200	500
	6200	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFS0J622L	100	—
	6800	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFS0J682L	100	—
	7500	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFS0J752L	100	—
		16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFS0J752S()	100	250
	8200	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFS0J822L	100	—
		16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFS0J822S()	100	250
	9100	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFS0J912()	100	250
10000	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFS0J103()	100	250	
10	180	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFS1A181()	200	2000
	330	6.3	11.2	455	0.130	5000	0.5	2.5	5.0	2.5	EEUFS1A331()	200	2000
	820	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFS1A821()	200	1000
	1000	10.0	12.5	1290	0.043	6000	0.6	5.0	5.0	—	EEUFS1A102()	200	500
	1200	8.0	15.0	1240	0.041	8000	0.6	3.5	5.0	—	EEUFS1A122L()	200	1000
		10.0	12.5	1290	0.043	6000	0.6	5.0	5.0	—	EEUFS1A122()	200	500
	1800	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFS1A182L()	200	1000
		10.0	16.0	1790	0.028	8000	0.6	5.0	5.0	—	EEUFS1A182()	200	500
	2000	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFS1A202()	200	500
	2200	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFS1A222()	200	500
	2700	10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFS1A272L()	200	500
	3600	12.5	20.0	2600	0.018	10000	0.6	5.0	5.0	—	EEUFS1A362()	200	500
	4700	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFS1A472()	200	500
	5100	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFS1A512L	100	—
	5600	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFS1A562L	100	—
		16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFS1A562S()	100	250
7500	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFS1A752L	100	—	
8200	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFS1A822()	100	250	

*1: Ripple current (100 kHz / +105 °C)

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Qty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impedance ^{*2} (Ω)	Endurance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
16	120	5.0	11.0	280	0.300	5000	0.5	2.0	5.0	2.5	EEUFS1C121()	200	2000
	510	8.0	11.5	950	0.056	6000	0.6	3.5	5.0	—	EEUFS1C511()	200	1000
	820	8.0	15.0	1240	0.041	8000	0.6	3.5	5.0	—	EEUFS1C821L()	200	1000
		10.0	12.5	1290	0.043	6000	0.6	5.0	5.0	—	EEUFS1C821()	200	500
	1200	8.0	20.0	1560	0.030	9000	0.6	3.5	5.0	—	EEUFS1C122L()	200	1000
		10.0	16.0	1790	0.028	8000	0.6	5.0	5.0	—	EEUFS1C122()	200	500
	1800	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFS1C182()	200	500
	2200	10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFS1C222L()	200	500
	2400	12.5	20.0	2600	0.018	10000	0.6	5.0	5.0	—	EEUFS1C242()	200	500
	3300	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFS1C332()	200	500
	3600	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFS1C362L	100	—
	3900	12.5	30.0	3630	0.013	10000	0.8	5.0	—	—	EEUFS1C392L	100	—
	4700	16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFS1C472S()	100	250
5100	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFS1C512L	100	—	
6200	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFS1C622()	100	250	
25	1200	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFS1E122()	200	500
	2200	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFS1E222()	200	500
	3300	12.5	35.0	3750	0.012	10000	0.8	5.0	—	—	EEUFS1E332L	100	—
	3900	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFS1E392()	100	250
35	330	8.0	15.0	1240	0.041	8000	0.6	3.5	5.0	—	EEUFS1V331L()	200	1000
	820	10.0	20.0	2180	0.020	10000	0.6	5.0	5.0	—	EEUFS1V821()	200	500
	1000	10.0	25.0	2470	0.018	10000	0.6	5.0	5.0	—	EEUFS1V102L()	200	500
	1500	12.5	25.0	3190	0.015	10000	0.6	5.0	5.0	—	EEUFS1V152()	200	500
	1800	16.0	20.0	3300	0.017	10000	0.8	7.5	7.5	—	EEUFS1V182S()	100	250
	2700	16.0	25.0	3820	0.014	10000	0.8	7.5	7.5	—	EEUFS1V272()	100	250
50	27	5.0	11.0	250	0.340	5000	0.5	2.0	5.0	2.5	EEUFS1H270()	200	2000
	150	8.0	15.0	1140	0.045	8000	0.6	3.5	5.0	—	EEUFS1H151L()	200	1000
	220	8.0	20.0	1430	0.033	9000	0.6	3.5	5.0	—	EEUFS1H221L()	200	1000
	330	10.0	20.0	1890	0.023	10000	0.6	5.0	5.0	—	EEUFS1H331()	200	500
	390	10.0	25.0	2150	0.022	10000	0.6	5.0	5.0	—	EEUFS1H391L()	200	500
	680	12.5	25.0	2660	0.018	10000	0.6	5.0	5.0	—	EEUFS1H681()	200	500
	820	12.5	30.0	3160	0.016	10000	0.8	5.0	—	—	EEUFS1H821L	100	—
	1000	12.5	35.0	3270	0.014	10000	0.8	5.0	—	—	EEUFS1H102L	100	—
	1200	16.0	25.0	3320	0.016	10000	0.8	7.5	7.5	—	EEUFS1H122()	100	250
63	27	5.0	11.0	175	0.510	5000	0.5	2.0	5.0	2.5	EEUFS1J270()	200	2000
	120	8.0	15.0	741	0.068	8000	0.6	3.5	5.0	—	EEUFS1J121L()	200	1000
		10.0	12.5	761	0.063	6000	0.6	5.0	5.0	—	EEUFS1J121()	200	500
	180	8.0	20.0	930	0.050	9000	0.6	3.5	5.0	—	EEUFS1J181L()	200	1000
		10.0	16.0	1073	0.045	8000	0.6	5.0	5.0	—	EEUFS1J181()	200	500
	330	10.0	25.0	1500	0.033	10000	0.6	5.0	5.0	—	EEUFS1J331L()	200	500
	390	12.5	20.0	1582	0.033	10000	0.6	5.0	5.0	—	EEUFS1J391()	200	500
	560	12.5	25.0	1995	0.027	10000	0.6	5.0	5.0	—	EEUFS1J561()	200	500
	680	16.0	20.0	2153	0.029	10000	0.8	7.5	7.5	—	EEUFS1J681S()	100	250
	820	12.5	35.0	2780	0.021	10000	0.8	5.0	—	—	EEUFS1J821L	100	—
1000	16.0	25.0	2988	0.024	10000	0.8	7.5	7.5	—	EEUFS1J102()	100	250	

*1: Ripple current (100 kHz / +105 °C)

*2: Impedance (100 kHz / +20 °C)

- When requesting taped product, please put the letter "B" or "H" between the "()".
Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.
- Please refer to the page of "Taping dimensions".

Characteristics list

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impedance ^{*2} (Ω)	Endurance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping
								Straight	Taping *B			
80	47	8.0	11.5	490	0.160	6000	0.6	3.5	5.0	EEUFS1K470()	200	1000
	56	8.0	11.5	490	0.160	6000	0.6	3.5	5.0	EEUFS1K560()	200	1000
	68	8.0	15.0	590	0.112	8000	0.6	3.5	5.0	EEUFS1K680()	200	1000
	82	8.0	15.0	590	0.112	8000	0.6	3.5	5.0	EEUFS1K820()	200	1000
	100	8.0	20.0	810	0.096	9000	0.6	3.5	5.0	EEUFS1K101L()	200	1000
		10.0	12.5	600	0.112	6000	0.6	5.0	5.0	EEUFS1K101()	200	500
	120	8.0	20.0	810	0.096	9000	0.6	3.5	5.0	EEUFS1K121L()	200	1000
	150	10.0	16.0	930	0.072	8000	0.6	5.0	5.0	EEUFS1K151()	200	500
	180	10.0	20.0	1120	0.054	10000	0.6	5.0	5.0	EEUFS1K181()	200	500
	220	10.0	20.0	1120	0.054	10000	0.6	5.0	5.0	EEUFS1K221()	200	500
		10.0	25.0	1200	0.044	10000	0.6	5.0	5.0	EEUFS1K221L()	200	500
	270	10.0	25.0	1200	0.044	10000	0.6	5.0	5.0	EEUFS1K271L()	200	500
		12.5	20.0	1400	0.043	10000	0.6	5.0	5.0	EEUFS1K271()	200	500
	390	12.5	25.0	1800	0.034	10000	0.6	5.0	5.0	EEUFS1K391()	200	500
	470	12.5	30.0	2200	0.030	10000	0.8	5.0	—	EEUFS1K471L()	100	—
		16.0	20.0	1450	0.032	10000	0.8	7.5	7.5	EEUFS1K471S()	100	250
560	12.5	35.0	2380	0.023	10000	0.8	5.0	—	EEUFS1K561L()	100	—	
680	16.0	25.0	2500	0.025	10000	0.8	7.5	7.5	EEUFS1K681()	100	250	
100	27	8.0	11.5	490	0.160	6000	0.6	3.5	5.0	EEUFS2A270()	200	1000
	33	8.0	11.5	490	0.160	6000	0.6	3.5	5.0	EEUFS2A330()	200	1000
	39	8.0	15.0	590	0.112	8000	0.6	3.5	5.0	EEUFS2A390()	200	1000
	47	8.0	15.0	590	0.112	8000	0.6	3.5	5.0	EEUFS2A470L()	200	1000
		10.0	12.5	600	0.112	6000	0.6	5.0	5.0	EEUFS2A470()	200	500
	56	8.0	20.0	810	0.096	9000	0.6	3.5	5.0	EEUFS2A560L()	200	1000
	68	8.0	20.0	810	0.096	9000	0.6	3.5	5.0	EEUFS2A680L()	200	1000
		10.0	16.0	930	0.072	8000	0.6	5.0	5.0	EEUFS2A680()	200	500
	120	10.0	20.0	1120	0.054	10000	0.6	5.0	5.0	EEUFS2A121()	200	500
		10.0	25.0	1200	0.044	10000	0.6	5.0	5.0	EEUFS2A121L()	200	500
	150	10.0	25.0	1200	0.044	10000	0.6	5.0	5.0	EEUFS2A151L()	200	500
		12.5	20.0	1400	0.043	10000	0.6	5.0	5.0	EEUFS2A151()	200	500
	180	12.5	25.0	1800	0.034	10000	0.6	5.0	5.0	EEUFS2A181()	200	500
	220	12.5	25.0	1800	0.034	10000	0.6	5.0	5.0	EEUFS2A221()	200	500
	270	12.5	30.0	2200	0.030	10000	0.8	5.0	—	EEUFS2A271L()	100	—
		16.0	20.0	1450	0.032	10000	0.8	7.5	7.5	EEUFS2A271S()	100	250
330	12.5	35.0	2380	0.023	10000	0.8	5.0	—	EEUFS2A331L()	100	—	
390	16.0	25.0	2500	0.025	10000	0.8	7.5	7.5	EEUFS2A391()	100	250	

*1: Ripple current (100 kHz / +105 °C)

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" between the "()".

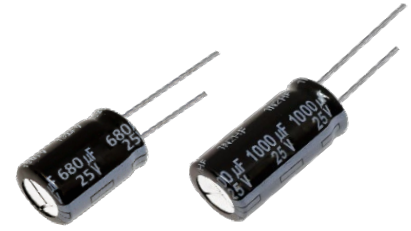
Lead wire pitch *B=5 mm, 7.5 mm.

• Please refer to the page of "Taping dimensions".

Aluminum Electrolytic Capacitors

Radial Lead Type

FP-A series



Features

- Endurance : 105 °C 4000 h to 5000 h
- High ripple current (2 to 2.5 times as high as FC series)
- Large capacitance (Up to 60 % larger than FC series)
- AEC-Q200 compliant
- RoHS compliant

Country of origin

- Malaysia

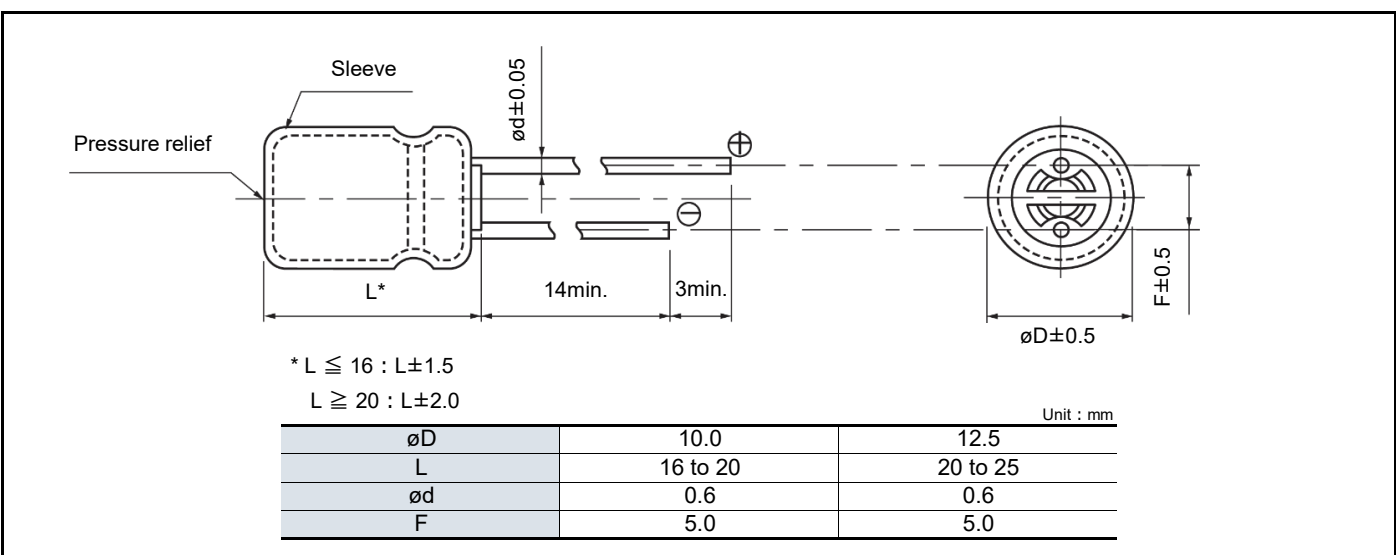
Specifications

Category temp. range	-55 °C to +105 °C		
Rated voltage range	25 V to 35 V		
Capacitance range	510 µF to 2000 µF		
Capacitance tolerance	±20 % (120 Hz / +20°C)		
Leakage current	$I \leq 0.01 CV (\mu A)$ After 2 minutes		
Dissipation factor (tan δ)	Rated voltage (V)	25	35
	Dissipation factor (tan δ)	0.14	0.12
(120 Hz / +20°C)			
For capacitance value $\geq 1000 \mu F$, add 0.02 per every 1000 µF.			
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage)when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow.		
	Duration ø10 : 4000 h, ø12.5 : 5000 h		
	Capacitance change	Within ±30 % of the initial value	
	Dissipation factor (tan δ)	≤ 300 % of the initial limit	
Shelf life	DC leakage current	Within the initial limit	
	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)		

Frequency correction factor for ripple current

Cap. (µF) \ Freq. (Hz)	120	1 k	10 k	100 k to
510 to 1000	0.65	0.75	0.95	1.00
1200 to 2000	0.75	0.80	1.00	1.00

Dimensions



Case size / Impedance / Ripple current

R. voltage Case size (mm) (ϕ D×L)	25 V to 35 V		
	ESR (Ω) (100 kHz)		Ripple current (mA rms) (100 kHz)
	+20 °C	-10 °C	+105 °C
10 × 16	0.068	0.136	2500
10 × 20	0.052	0.104	3000
12.5 × 20	0.038	0.076	3250
12.5 × 25	0.030	0.060	4000

Characteristics list

Rated voltage (V)	Capacitance ($\pm 20\%$) (μ F)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)	
		ϕ D	L	Ripple current ^{*1} (mA rms)	ESR ^{*2} (Ω)	Endu- rance (h)	Lead dia. (ϕ d)	Lead space			Straight leads	Taping
								Straight	Taping *B			
25	680	10.0	16.0	2500	0.068	4000	0.6	5.0	5.0	EEUFP1E681()	200	500
	1000	10.0	20.0	3000	0.052	4000	0.6	5.0	5.0	EEUFP1E102()	200	500
	1500	12.5	20.0	3250	0.038	5000	0.6	5.0	5.0	EEUFP1E152()	200	500
	2000	12.5	25.0	4000	0.030	5000	0.6	5.0	5.0	EEUFP1E202()	200	500
35	510	10.0	16.0	2500	0.068	4000	0.6	5.0	5.0	EEUFP1V511()	200	500
	750	10.0	20.0	3000	0.052	4000	0.6	5.0	5.0	EEUFP1V751()	200	500
	1000	12.5	20.0	3250	0.038	5000	0.6	5.0	5.0	EEUFP1V102()	200	500
	1300	12.5	25.0	4000	0.030	5000	0.6	5.0	5.0	EEUFP1V132()	200	500

*1: Ripple current (100 kHz / +105 °C)

*2: ESR (100 kHz / +20 °C)

- When requesting taped product, please put the letter "B". Lead wire pitch *B=5 mm.
- Please refer to the page of "Taping dimensions".

! Some part numbers are not recommended for new design.



Aluminum Electrolytic Capacitors

Radial Lead Type

ED-A series

*Propose EE series for New design

■ Not available in Japan

Features

- Endurance : 105 °C 8000 h to 10000 h
- High ripple current (at high frequency)
- Including low profile products (20 mm height)
- RoHS compliant

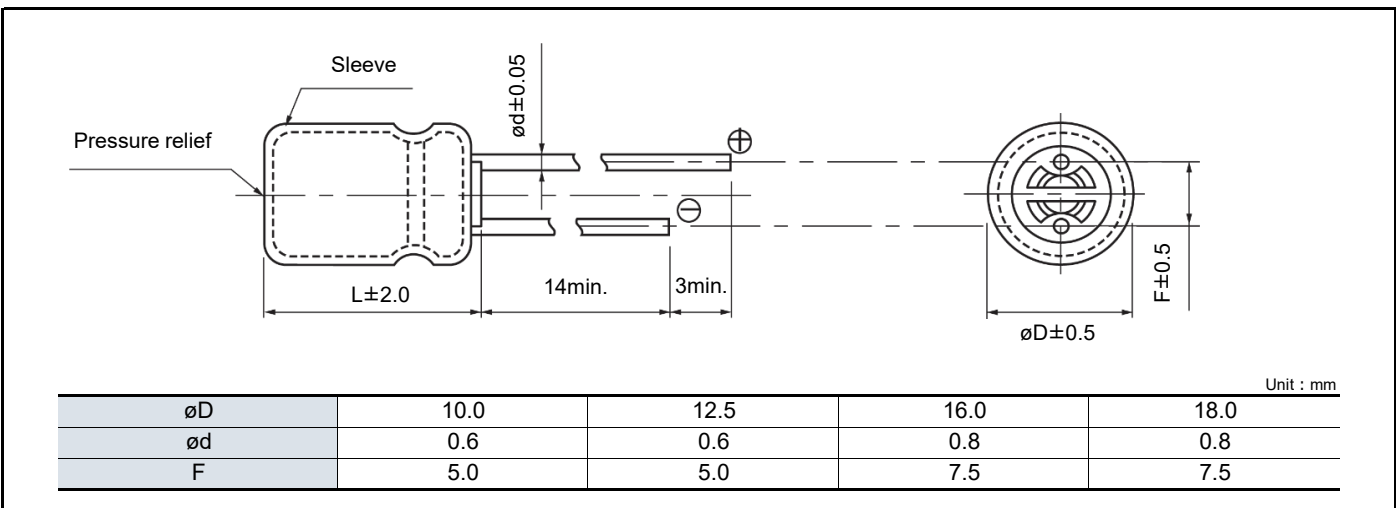
Specifications

Category temp. range	-25 °C to +105 °C							
Rated voltage range	160 V to 450 V							
Capacitance range	10 µF to 330 µF							
Capacitance tolerance	±20 % (120 Hz / +20°C)							
Leakage current	$I \leq 0.06 CV + 10 (\mu A)$ After 2 minutes application of rated working voltage at +20 °C							
Dissipation factor (tan δ)	Please see the attached characteristics list							
Characteristics at low temperature	Rated voltage (V)	160	200	250	350	400	450	(Impedance ratio at 120 Hz)
	Z(-25 °C) / Z(+20 °C)	3	3	3	6	6	6	
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage) when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow.							
	Duration							
	ø10 : 8000 h							
	ø12.5 to ø18 : 10000 h							
	Capacitance change	Within ±20 % of the initial value						
	Dissipation factor (tan δ)	≤ 200 % of the initial limit						
	DC leakage current	Within the initial limit						
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)							

Frequency correction factor for ripple current

Freq. (Hz)	50	120	300	1 k	10 k	100 k to
Cap. (µF)						
10 to 82	0.30	0.40	0.55	0.70	0.90	1.00
100 to 330	0.35	0.45	0.60	0.75	0.90	1.00

Dimensions



Characteristics list

Endurance : 105 °C 8000 h / ϕ 10, 105 °C 10000 h / ϕ 12.5 to ϕ 18

Rated voltage (V)	Capacitance ($\pm 20\%$) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		ϕD	L	Ripple current ^{*1} (mA rms)	$\tan \delta^{*2}$	Endurance (h)	Lead dia. (ϕ)	Lead space			Straight leads	Taping	
								Straight	Taping *B				
160	22	10.0	20.0	500	0.15	8000	0.6	5.0	5.0	EEUED2C220()	200	500	
	33	10.0	20.0	580	0.15	8000	0.6	5.0	5.0	EEUED2C330()	200	500	
	47	10.0	20.0	750	0.15	8000	0.6	5.0	5.0	EEUED2C470()	200	500	
	68	12.5	20.0	950	0.15	10000	0.6	5.0	5.0	EEUED2C680()	200	500	
	82	12.5	25.0	1060	0.15	10000	0.6	5.0	5.0	EEUED2C820()	200	500	
	100	12.5	25.0	1170	0.15	10000	0.6	5.0	5.0	EEUED2C101()	200	500	
		16.0	20.0	1280	0.15	10000	0.8	7.5	7.5	EEUED2C101S()	100	250	
	150	16.0	25.0	1400	0.15	10000	0.8	7.5	7.5	EEUED2C151()	100	250	
		18.0	20.0	1400	0.15	10000	0.8	7.5	7.5	EEUED2C151S()	100	250	
	220	16.0	31.5	1700	0.15	10000	0.8	7.5	—	EEUED2C221	100	—	
18.0		25.0	1500	0.15	10000	0.8	7.5	7.5	EEUED2C221S()	100	250		
NRFND	330	18.0	31.5	2000	0.15	10000	0.8	7.5	—	EEUED2C331	50	—	
200	22	10.0	20.0	600	0.15	8000	0.6	5.0	5.0	EEUED2D220()	200	500	
	33	10.0	20.0	650	0.15	8000	0.6	5.0	5.0	EEUED2D330()	200	500	
	47	12.5	20.0	790	0.15	10000	0.6	5.0	5.0	EEUED2D470()	200	500	
	68	12.5	25.0	950	0.15	10000	0.6	5.0	5.0	EEUED2D680()	200	500	
		16.0	20.0	1000	0.15	10000	0.8	7.5	7.5	EEUED2D680S()	100	250	
	82	16.0	20.0	1100	0.15	10000	0.8	7.5	7.5	EEUED2D820S()	100	250	
	100	16.0	25.0	1300	0.15	10000	0.8	7.5	7.5	EEUED2D101()	100	250	
		18.0	20.0	1280	0.15	10000	0.8	7.5	7.5	EEUED2D101S()	100	250	
	150	16.0	25.0	1400	0.15	10000	0.8	7.5	7.5	EEUED2D151()	100	250	
	NRFND	220	18.0	31.5	2000	0.15	10000	0.8	7.5	—	EEUED2D221	50	—
NRFND	330	18.0	40.0	2400	0.15	10000	0.8	7.5	—	EEUED2D331	50	—	
250	22	10.0	20.0	560	0.15	8000	0.6	5.0	5.0	EEUED2E220()	200	500	
	33	12.5	20.0	710	0.15	10000	0.6	5.0	5.0	EEUED2E330()	200	500	
	47	12.5	25.0	920	0.15	10000	0.6	5.0	5.0	EEUED2E470()	200	500	
		16.0	20.0	990	0.15	10000	0.8	7.5	7.5	EEUED2E470S()	100	250	
	68	16.0	20.0	1000	0.15	10000	0.8	7.5	7.5	EEUED2E680S()	100	250	
	82	16.0	25.0	1200	0.15	10000	0.8	7.5	7.5	EEUED2E820()	100	250	
		18.0	20.0	1200	0.15	10000	0.8	7.5	7.5	EEUED2E820S()	100	250	
	100	16.0	31.5	1500	0.15	10000	0.8	7.5	—	EEUED2E101	100	—	
		18.0	25.0	1500	0.15	10000	0.8	7.5	7.5	EEUED2E101S()	100	250	
	NRFND	150	18.0	31.5	1800	0.15	10000	0.8	7.5	—	EEUED2E151	50	—
NRFND	220	18.0	40.0	2100	0.15	10000	0.8	7.5	—	EEUED2E221	50	—	
350	10	10.0	20.0	350	0.20	8000	0.6	5.0	5.0	EEUED2V100()	200	500	
	22	12.5	20.0	480	0.20	10000	0.6	5.0	5.0	EEUED2V220()	200	500	
	33	16.0	20.0	640	0.20	10000	0.8	7.5	7.5	EEUED2V330S()	100	250	
		16.0	25.0	800	0.20	10000	0.8	7.5	7.5	EEUED2V470()	100	250	
	47	18.0	20.0	800	0.20	10000	0.8	7.5	7.5	EEUED2V470S()	100	250	
		16.0	31.5	1100	0.20	10000	0.8	7.5	—	EEUED2V680	100	—	
	68	18.0	25.0	1000	0.20	10000	0.8	7.5	7.5	EEUED2V680S()	100	250	
		82	18.0	25.0	1100	0.20	10000	0.8	7.5	7.5	EEUED2V820S()	100	250
	NRFND	100	18.0	31.5	1200	0.20	10000	0.8	7.5	—	EEUED2V101	50	—

*1: Ripple current (100 kHz / +105 °C)

*2: $\tan \delta$ (120 Hz / +20 °C)**NRFND** Not recommended for new design

- When requesting taped product, please put the letter "B". Lead wire pitch *B=5 mm, 7.5 mm.
- Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 8000 h / ϕ 10, 105 °C 10000 h / ϕ 12.5 to ϕ 18

Rated voltage (V)	Capacitance ($\pm 20\%$) (μ F)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Qty (PCS)	
		ϕ D	L	Ripple current ^{*1} (mA rms)	$\tan \delta$ ^{*2}	Endurance (h)	Lead dia. (ϕ d)	Lead space			Straight leads	Taping
								Straight	Taping *B			
400	10	10.0	20.0	300	0.24	8000	0.6	5.0	5.0	EEUED2G100()	200	500
	15	12.5	20.0	410	0.24	10000	0.6	5.0	5.0	EEUED2G150()	200	500
	22	12.5	25.0	500	0.24	10000	0.6	5.0	5.0	EEUED2G220()	200	500
		16.0	20.0	600	0.24	10000	0.8	7.5	7.5	EEUED2G220S()	100	250
	33	16.0	20.0	730	0.24	10000	0.8	7.5	7.5	EEUED2G330S()	100	250
	47	16.0	25.0	840	0.24	10000	0.8	7.5	7.5	EEUED2G470()	100	250
		18.0	20.0	840	0.24	10000	0.8	7.5	7.5	EEUED2G470S()	100	250
	NRFND	68	18.0	31.5	1200	0.24	10000	0.8	7.5	—	EEUED2G680	50
NRFND	82	18.0	40.0	1500	0.24	10000	0.8	7.5	—	EEUED2G820	50	—
450	10	12.5	20.0	350	0.24	10000	0.6	5.0	5.0	EEUED2W100()	200	500
	15	12.5	25.0	560	0.24	10000	0.6	5.0	5.0	EEUED2W150()	200	500
	22	16.0	20.0	680	0.24	10000	0.8	7.5	7.5	EEUED2W220S()	100	250
	33	16.0	31.5	850	0.24	10000	0.8	7.5	—	EEUED2W330	100	—
		18.0	25.0	850	0.24	10000	0.8	7.5	7.5	EEUED2W330S()	100	250
	NRFND	47	18.0	31.5	1000	0.24	10000	0.8	7.5	—	EEUED2W470	50
NRFND	68	18.0	40.0	1300	0.24	10000	0.8	7.5	—	EEUED2W680	50	—

*1: Ripple current (100 kHz / +105 °C)

NRFND

Not recommended for new design

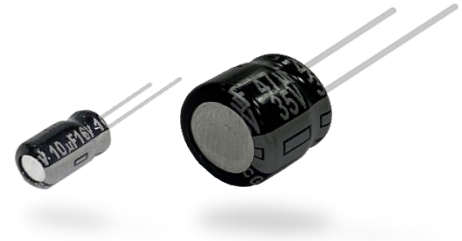
*2: $\tan \delta$ (120 Hz / +20 °C)

- When requesting taped product, please put the letter "B". Lead wire pitch *B=5 mm, 7.5 mm.
- Please refer to the page of "Taping dimensions".

Aluminum Electrolytic Capacitors

Radial Lead Type

GA-A series



Features

- Endurance : 105 °C 1000 h
- RoHS compliant

Specifications

Category temp. range	-55 °C to +105 °C		
Rated voltage range	10 V to 50 V		
Capacitance range	1.5 μF to 220 μF		
Capacitance tolerance	±20 % (120 Hz / +20°C)		
Leakage current	I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)		
Dissipation factor (tan δ)	Please see the attached characteristics list		
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage), for 1000 hours, when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified below.		
	Capacitance change	Within ±20 % of the initial value	
	Dissipation factor (tan δ)	≤ 200 % of the initial limit	
	DC leakage current	Within the initial limit	
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)		

Frequency correction factor for ripple current

Freq. (Hz)	60	120	1 k	10 k	100 k to
Cap. (μF)					
1.5 to 220	0.85	1.00	1.30	1.40	1.55

Dimensions

	Unit : mm			
øD	4.0	5.0	6.3	8.0
ød	0.45	0.45	0.45	0.45
F	1.5	2.0	2.5	2.5

Characteristics list

Endurance : 105 °C 1000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current* ¹ (mA rms)	tan δ ²	Endurance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				Taping *H
10	22	4.0	7.0	30	0.22	1000	0.45	1.5	5.0	2.5	EEAGA1A220()	200	2000
	33	5.0	7.0	50	0.22	1000	0.45	2.0	5.0	2.5	EEAGA1A330()	200	2000
	47	6.3	7.0	65	0.22	1000	0.45	2.5	5.0	2.5	EEAGA1A470()	200	2000
	68	6.3	7.0	75	0.22	1000	0.45	2.5	5.0	2.5	EEAGA1A680()	200	2000
	100	6.3	7.0	110	0.22	1000	0.45	2.5	5.0	2.5	EEAGA1A101()	200	2000
	220	8.0	7.0	160	0.22	1000	0.45	2.5	5.0	2.5	EEAGA1A221()	200	1000
16	10	4.0	7.0	30	0.18	1000	0.45	1.5	5.0	2.5	EEAGA1C100()	200	2000
	15	4.0	7.0	33	0.18	1000	0.45	1.5	5.0	2.5	EEAGA1C150()	200	2000
	22	5.0	7.0	50	0.18	1000	0.45	2.0	5.0	2.5	EEAGA1C220()	200	2000
	33	6.3	7.0	65	0.18	1000	0.45	2.5	5.0	2.5	EEAGA1C330()	200	2000
	47	6.3	7.0	77	0.18	1000	0.45	2.5	5.0	2.5	EEAGA1C470()	200	2000
	100	8.0	7.0	120	0.18	1000	0.45	2.5	5.0	2.5	EEAGA1C101()	200	1000
25	10	4.0	7.0	33	0.16	1000	0.45	1.5	5.0	2.5	EEAGA1E100()	200	2000
	15	5.0	7.0	45	0.16	1000	0.45	2.0	5.0	2.5	EEAGA1E150()	200	2000
	22	5.0	7.0	50	0.16	1000	0.45	2.0	5.0	2.5	EEAGA1E220()	200	2000
	33	6.3	7.0	75	0.16	1000	0.45	2.5	5.0	2.5	EEAGA1E330()	200	2000
	68	8.0	7.0	100	0.16	1000	0.45	2.5	5.0	2.5	EEAGA1E680()	200	1000
35	6.8	4.0	7.0	33	0.13	1000	0.45	1.5	5.0	2.5	EEAGA1V6R8()	200	2000
	10	5.0	7.0	35	0.13	1000	0.45	2.0	5.0	2.5	EEAGA1V100()	200	2000
	15	6.3	7.0	50	0.13	1000	0.45	2.5	5.0	2.5	EEAGA1V150()	200	2000
	22	6.3	7.0	70	0.13	1000	0.45	2.5	5.0	2.5	EEAGA1V220()	200	2000
	47	8.0	7.0	96	0.13	1000	0.45	2.5	5.0	2.5	EEAGA1V470()	200	1000
50	1.5	4.0	7.0	16	0.10	1000	0.45	1.5	5.0	2.5	EEAGA1H1R5()	200	2000
	2.2	4.0	7.0	18	0.10	1000	0.45	1.5	5.0	2.5	EEAGA1H2R2()	200	2000
	3.3	4.0	7.0	22	0.10	1000	0.45	1.5	5.0	2.5	EEAGA1H3R3()	200	2000
	4.7	4.0	7.0	26	0.10	1000	0.45	1.5	5.0	2.5	EEAGA1H4R7()	200	2000
	6.8	5.0	7.0	35	0.10	1000	0.45	2.0	5.0	2.5	EEAGA1H6R8()	200	2000
	10	6.3	7.0	39	0.10	1000	0.45	2.5	5.0	2.5	EEAGA1H100()	200	2000
	15	6.3	7.0	55	0.10	1000	0.45	2.5	5.0	2.5	EEAGA1H150()	200	2000
	22	8.0	7.0	70	0.10	1000	0.45	2.5	5.0	2.5	EEAGA1H220()	200	1000
	33	8.0	7.0	91	0.10	1000	0.45	2.5	5.0	2.5	EEAGA1H330()	200	1000

*1: Ripple current (120 Hz / +105 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, H=2.5 mm. Suffix "BQ" for ø8×7, 5 mm pitch products

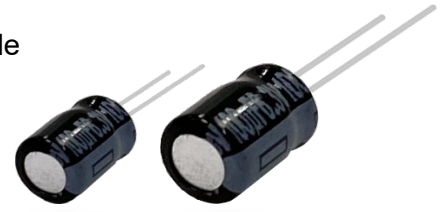
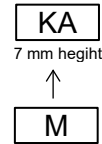
• Please refer to the page of "Taping dimensions".

Aluminum Electrolytic Capacitors

Radial Lead Type

KA-A series

Low Profile



Features

- Endurance : 85 °C 1000 h
- 7 mm height
- RoHS compliant

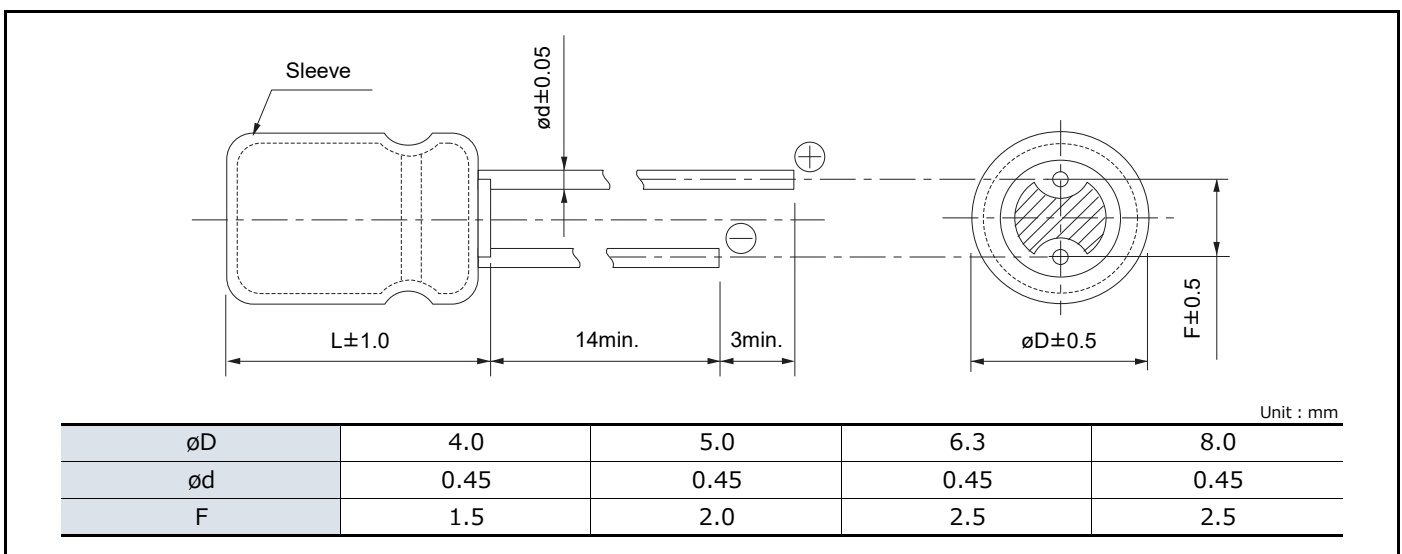
Specifications

Category temp. range	-40 °C to +85 °C	
Rated voltage range	4 V to 50 V	
Capacitance range	2.2 μF to 470 μF	
Capacitance tolerance	±20 % (120 Hz / +20°C)	
Leakage current	I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)	
Dissipation factor (tan δ)	Please see the attached characteristics list	
Endurance	After applying rated working voltage for 1000 h at +85 °C±2 °C when the capacitors are restored to 20 °C, capacitors shall meet the following limits.	
	Capacitance change	Within ±20 % of the initial value
	Dissipation factor (tan δ)	≤ 200 % of the initial limit
	DC leakage current	Within the initial limit
Shelf life	After storage for 1000 h at +85 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)	

Frequency correction factor for ripple current

Freq. (Hz)	50, 60	120	1 k	10 k to
Cap. (μF)				
2.2 to 470	0.70	1.00	1.30	1.70

Dimensions



Characteristics list

Endurance : 85 °C 1000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Lead dia. (ød)	Lead space			Straight leads	Taping	
							Straight	Taping *B				Taping *i
4	47	4.0	7.0	34	0.35	0.45	1.5	5.0	2.5	ECEA0GKA470()	200	2000
	100	5.0	7.0	61	0.35	0.45	2.0	5.0	2.5	ECEA0GKA101()	200	2000
	220	6.3	7.0	82	0.35	0.45	2.5	5.0	2.5	ECEA0GKA221()	200	2000
	330	8.0	7.0	110	0.35	0.45	2.5	—	2.5	ECEA0GKA331()	200	1000
		8.0	7.0	110	0.35	0.45	—	5.0	—	ECEA0GKA331Q	—	1000
	470	8.0	7.0	140	0.35	0.45	2.5	—	2.5	ECEA0GKA471()	200	1000
8.0		7.0	140	0.35	0.45	—	5.0	—	ECEA0GKA471Q	—	1000	
6.3	47	4.0	7.0	46	0.24	0.45	1.5	5.0	2.5	ECEA0JKA470()	200	2000
	100	5.0	7.0	71	0.24	0.45	2.0	5.0	2.5	ECEA0JKA101()	200	2000
	220	6.3	7.0	103	0.24	0.45	2.5	5.0	2.5	ECEA0JKA221()	200	2000
	330	8.0	7.0	130	0.24	0.45	2.5	—	2.5	ECEA0JKA331()	200	1000
		8.0	7.0	130	0.24	0.45	—	5.0	—	ECEA0JKA331Q	—	1000
10	33	4.0	7.0	43	0.20	0.45	1.5	5.0	2.5	ECEA1AKA330()	200	2000
	100	6.3	7.0	80	0.20	0.45	2.5	5.0	2.5	ECEA1AKA101()	200	2000
	220	8.0	7.0	120	0.20	0.45	2.5	—	2.5	ECEA1AKA221()	200	1000
		8.0	7.0	120	0.20	0.45	—	5.0	—	ECEA1AKA221Q	—	1000
16	10	4.0	7.0	28	0.16	0.45	1.5	5.0	2.5	ECEA1CKA100()	200	2000
	22	4.0	7.0	39	0.16	0.45	1.5	5.0	2.5	ECEA1CKA220()	200	2000
	33	5.0	7.0	60	0.16	0.45	2.0	5.0	2.5	ECEA1CKA330()	200	2000
	47	5.0	7.0	70	0.16	0.45	2.0	5.0	2.5	ECEA1CKA470()	200	2000
	100	6.3	7.0	91	0.16	0.45	2.5	5.0	2.5	ECEA1CKA101()	200	2000
25	10	4.0	7.0	28	0.14	0.45	1.5	5.0	2.5	ECEA1EKA100()	200	2000
	22	5.0	7.0	55	0.14	0.45	2.0	5.0	2.5	ECEA1EKA220()	200	2000
	33	6.3	7.0	65	0.14	0.45	2.5	5.0	2.5	ECEA1EKA330()	200	2000
	47	6.3	7.0	70	0.14	0.45	2.5	5.0	2.5	ECEA1EKA470()	200	2000
8.0		7.0	85	0.12	0.45	2.5	—	2.5	ECEA1VKA470()	200	1000	
35	10	5.0	7.0	30	0.12	0.45	2.0	5.0	2.5	ECEA1VKA100()	200	2000
	22	6.3	7.0	60	0.12	0.45	2.5	5.0	2.5	ECEA1VKA220()	200	2000
	33	6.3	7.0	65	0.12	0.45	2.5	5.0	2.5	ECEA1VKA330()	200	2000
	47	8.0	7.0	85	0.12	0.45	2.5	—	2.5	ECEA1VKA470()	200	1000
		8.0	7.0	85	0.12	0.45	—	5.0	—	ECEA1VKA470Q	—	1000
50	2.2	4.0	7.0	16	0.10	0.45	1.5	5.0	2.5	ECEA1HKA2R2()	200	2000
	3.3	4.0	7.0	18	0.10	0.45	1.5	5.0	2.5	ECEA1HKA3R3()	200	2000
	4.7	4.0	7.0	23	0.10	0.45	1.5	5.0	2.5	ECEA1HKA4R7()	200	2000
	10	5.0	7.0	35	0.10	0.45	2.0	5.0	2.5	ECEA1HKA100()	200	2000
	22	6.3	7.0	60	0.10	0.45	2.5	5.0	2.5	ECEA1HKA220()	200	2000
		8.0	7.0	75	0.10	0.45	2.5	—	2.5	ECEA1HKA330()	200	1000
33	8.0	7.0	75	0.10	0.45	—	5.0	—	ECEA1HKA330Q	—	1000	

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, i=2.5 mm.

• Please refer to the page of "Taping dimensions".

Aluminum Electrolytic Capacitors

Radial Lead Type

KA-A (Bi-polar) series



Features

- Endurance : 85 °C 1000 h
- 7 mm height
- RoHS compliant

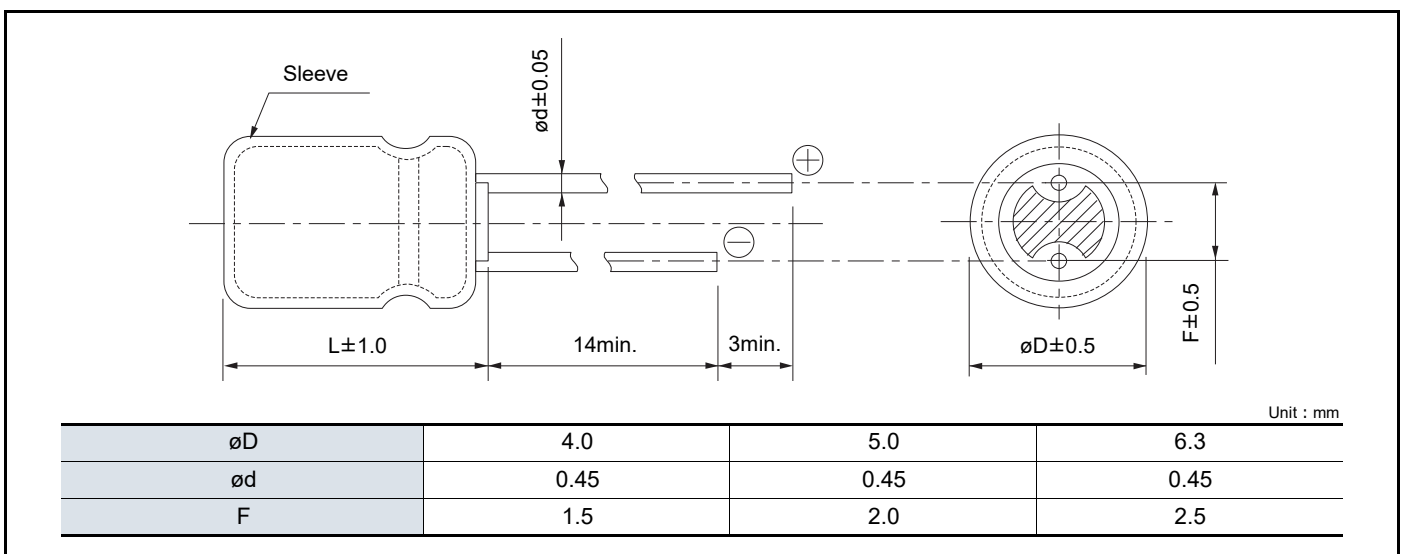
Specifications

Category temp. range	-40 °C to +85 °C	
Rated voltage range	4 V to 50 V	
Capacitance range	2.2 μF to 100 μF	
Capacitance tolerance	±20 % (120 Hz / +20°C)	
Leakage current	$I \leq 0.05 CV$ or 10 (μA) After 2 minutes (Whichever is greater)	
Dissipation factor (tan δ)	Please see the attached characteristics list	
Endurance	After 1000 h application of DC working voltage (500 h for each polarity) at +85 °C±2 °C, when the capacitors are restored to 20 °C, the capacitors shall meet the following limits.	
	Capacitance change	Within ±20 % of the initial value
	Dissipation factor (tan δ)	≤ 200 % of the initial limit
	DC leakage current	Within the initial limit
Shelf life	After storage for 1000 h at +85 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)	

Frequency correction factor for ripple current

Freq. (Hz)	50, 60	120	1 k	10 k to
Cap. (μF)				
2.2 to 100	0.70	1.00	1.30	1.70

Dimensions



Characteristics list

Endurance : 85 °C 1000 h (500 h for each polarity)

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Lead dia. (ød)	Lead space			Straight leads	Taping	
							Straight	Taping *B				Taping *i
4	100	6.3	7.0	61	0.35	0.45	2.5	5.0	2.5	ECEA0GKN101()	200	2000
6.3	22	5.0	7.0	29	0.24	0.45	2.0	5.0	2.5	ECEA0JKN220()	200	2000
	33	5.0	7.0	38	0.24	0.45	2.0	5.0	2.5	ECEA0JKN330()	200	2000
	47	6.3	7.0	46	0.24	0.45	2.5	5.0	2.5	ECEA0JKN470()	200	2000
10	10	4.0	7.0	25	0.20	0.45	1.5	5.0	2.5	ECEA1AKN100()	200	2000
	22	5.0	7.0	35	0.20	0.45	2.0	5.0	2.5	ECEA1AKN220()	200	2000
	33	6.3	7.0	43	0.20	0.45	2.5	5.0	2.5	ECEA1AKN330()	200	2000
	47	6.3	7.0	65	0.20	0.45	2.5	5.0	2.5	ECEA1AKN470()	200	2000
16	4.7	4.0	7.0	20	0.16	0.45	1.5	5.0	2.5	ECEA1CKN4R7()	200	2000
	10	5.0	7.0	25	0.16	0.45	2.0	5.0	2.5	ECEA1CKN100()	200	2000
	22	6.3	7.0	39	0.16	0.45	2.5	5.0	2.5	ECEA1CKN220()	200	2000
	33	6.3	7.0	60	0.16	0.45	2.5	5.0	2.5	ECEA1CKN330()	200	2000
25	3.3	4.0	7.0	16	0.16	0.45	1.5	5.0	2.5	ECEA1EKN3R3()	200	2000
	4.7	5.0	7.0	21	0.16	0.45	2.0	5.0	2.5	ECEA1EKN4R7()	200	2000
	10	6.3	7.0	28	0.16	0.45	2.5	5.0	2.5	ECEA1EKN100()	200	2000
	22	6.3	7.0	55	0.16	0.45	2.5	5.0	2.5	ECEA1EKN220()	200	2000
35	2.2	4.0	7.0	12	0.14	0.45	1.5	5.0	2.5	ECEA1VKN2R2()	200	2000
	3.3	5.0	7.0	16	0.14	0.45	2.0	5.0	2.5	ECEA1VKN3R3()	200	2000
	4.7	5.0	7.0	22	0.14	0.45	2.0	5.0	2.5	ECEA1VKN4R7()	200	2000
	10	6.3	7.0	30	0.14	0.45	2.5	5.0	2.5	ECEA1VKN100()	200	2000
50	2.2	5.0	7.0	16	0.12	0.45	2.0	5.0	2.5	ECEA1HKN2R2()	200	2000
	3.3	5.0	7.0	16	0.12	0.45	2.0	5.0	2.5	ECEA1HKN3R3()	200	2000
	4.7	6.3	7.0	23	0.12	0.45	2.5	5.0	2.5	ECEA1HKN4R7()	200	2000

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, i=2.5 mm.

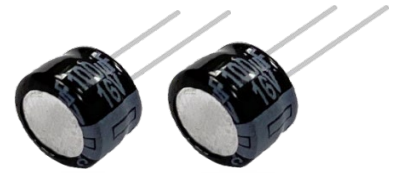
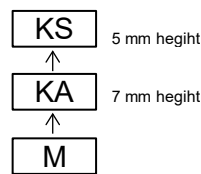
• Please refer to the page of "Taping dimensions".

Aluminum Electrolytic Capacitors

Radial Lead Type

KS-A series

Low Profile



Features

- Endurance : 85 °C 1000 h
- 5 mm height
- RoHS compliant

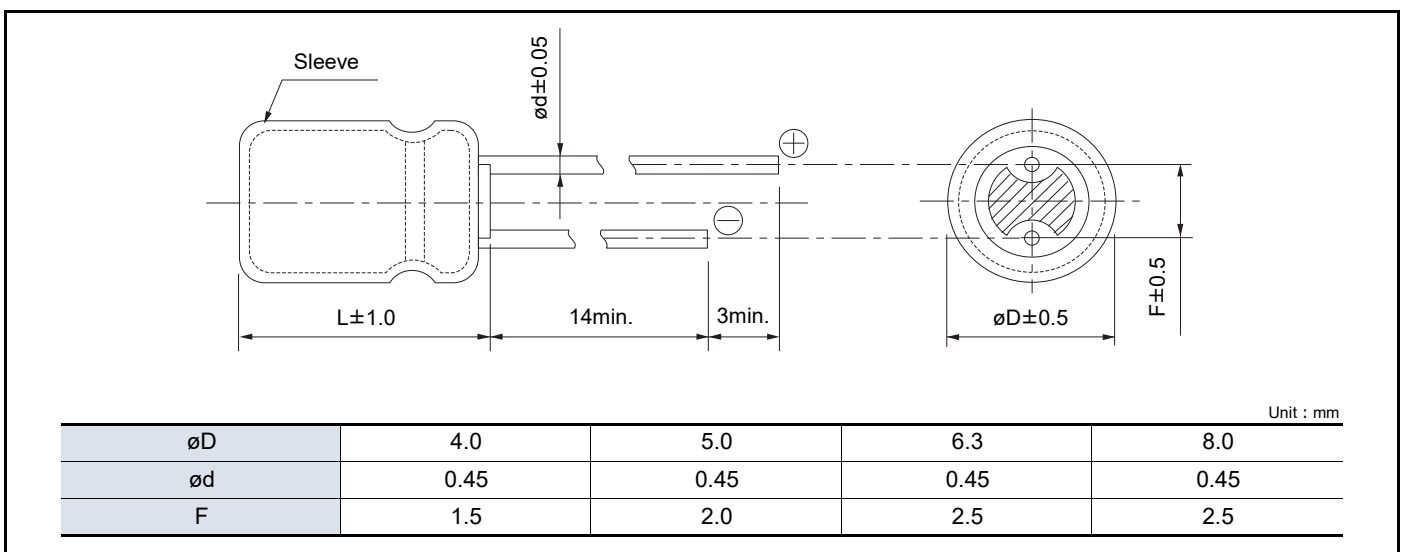
Specifications

Category temp. range	-40 °C to +85 °C	
Rated voltage range	4 V to 50 V	
Capacitance range	2.2 μF to 330 μF	
Capacitance tolerance	±20 % (120 Hz / +20°C)	
Leakage current	I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)	
Dissipation factor (tan δ)	Please see the attached characteristics list	
Endurance	After applying rated working voltage for 1000 h at +85 °C±2 °C when the capacitors are restored to 20 °C, capacitors shall meet the following limits.	
	Capacitance change	Within ±20 % of the initial value (4 V : ±30 %)
	Dissipation factor (tan δ)	≤ 200 % of the initial limit
	DC leakage current	Within the initial limit
Shelf life	After storage for 1000 h at +85 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)	

Frequency correction factor for ripple current

Freq. (Hz)	50, 60	120	1 k	10 k to
Cap. (μF)				
2.2 to 330	0.70	1.00	1.30	1.70

Dimensions



Characteristics list

Endurance : 85 °C 1000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)				Part No.	Min. Packaging Qty (PCS)		
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Lead dia. (ød)	Lead space				Straight leads	Taping	
							Straight	Taping *B	Taping *i				
4	33	4.0	5.0	26	0.35	0.45	1.5	5.0	2.5	ECEA0GKS330()	200	2000	
	47	4.0	5.0	34	0.35	0.45	1.5	5.0	2.5	ECEA0GKS470()	200	2000	
	100	5.0	5.0	61	0.35	0.45	2.0	5.0	2.5	ECEA0GKS101()	200	2000	
	220	6.3	5.0	82	0.35	0.45	2.5	5.0	2.5	ECEA0GKS221()	200	2000	
6.3	22	4.0	5.0	29	0.24	0.45	1.5	5.0	2.5	ECEA0JKS220()	200	2000	
	33	5.0	5.0	38	0.24	0.45	2.0	5.0	2.5	ECEA0JKS330()	200	2000	
	47	5.0	5.0	46	0.24	0.45	2.0	5.0	2.5	ECEA0JKS470()	200	2000	
	100	6.3	5.0	71	0.24	0.45	2.5	5.0	2.5	ECEA0JKS101()	200	2000	
	330	8.0	5.0	130	0.24	0.45	2.5	—	2.5	ECEA0JKS331()	200	1000	
		8.0	5.0	130	0.24	0.45	—	5.0	—	ECEA0JKS331Q	—	1000	
10	22	5.0	5.0	35	0.20	0.45	2.0	5.0	2.5	ECEA1AKS220()	200	2000	
	33	5.0	5.0	43	0.20	0.45	2.0	5.0	2.5	ECEA1AKS330()	200	2000	
	47	6.3	5.0	65	0.20	0.45	2.5	5.0	2.5	ECEA1AKS470()	200	2000	
	100	6.3	5.0	80	0.20	0.45	2.5	5.0	2.5	ECEA1AKS101()	200	2000	
	220	8.0	5.0	120	0.20	0.45	2.5	—	2.5	ECEA1AKS221()	200	1000	
			8.0	5.0	120	0.20	0.45	—	5.0	—	ECEA1AKS221Q	—	1000
16	10	4.0	5.0	28	0.16	0.45	1.5	5.0	2.5	ECEA1CKS100()	200	2000	
	22	5.0	5.0	39	0.16	0.45	2.0	5.0	2.5	ECEA1CKS220()	200	2000	
	33	6.3	5.0	60	0.16	0.45	2.5	5.0	2.5	ECEA1CKS330()	200	2000	
	47	6.3	5.0	70	0.16	0.45	2.5	5.0	2.5	ECEA1CKS470()	200	2000	
	100	8.0	5.0	91	0.16	0.45	2.5	—	2.5	ECEA1CKS101()	200	1000	
			8.0	5.0	91	0.16	0.45	—	5.0	—	ECEA1CKS101Q	—	1000
25	4.7	4.0	5.0	22	0.14	0.45	1.5	5.0	2.5	ECEA1EKS4R7()	200	2000	
	10	5.0	5.0	28	0.14	0.45	2.0	5.0	2.5	ECEA1EKS100()	200	2000	
	22	6.3	5.0	55	0.14	0.45	2.5	5.0	2.5	ECEA1EKS220()	200	2000	
	33	6.3	5.0	65	0.14	0.45	2.5	5.0	2.5	ECEA1EKS330()	200	2000	
	100	8.0	5.0	85	0.14	0.45	2.5	—	2.5	ECEA1EKS101()	200	1000	
			8.0	5.0	85	0.14	0.45	—	5.0	—	ECEA1EKS101Q	—	1000
35	3.3	4.0	5.0	16	0.12	0.45	1.5	5.0	2.5	ECEA1VKS3R3()	200	2000	
	4.7	4.0	5.0	22	0.12	0.45	1.5	5.0	2.5	ECEA1VKS4R7()	200	2000	
	10	5.0	5.0	30	0.12	0.45	2.0	5.0	2.5	ECEA1VKS100()	200	2000	
	22	6.3	5.0	60	0.12	0.45	2.5	5.0	2.5	ECEA1VKS220()	200	2000	
	33	8.0	5.0	65	0.12	0.45	2.5	—	2.5	ECEA1VKS330()	200	1000	
			8.0	5.0	65	0.12	0.45	—	5.0	—	ECEA1VKS330Q	—	1000
	47	8.0	5.0	85	0.12	0.45	2.5		2.5	ECEA1VKS470()	200	1000	
			8.0	5.0	85	0.12	0.45	—	5.0	—	ECEA1VKS470Q	—	1000
50	2.2	4.0	5.0	16	0.10	0.45	1.5	5.0	2.5	ECEA1HKS2R2()	200	2000	
	3.3	4.0	5.0	16	0.10	0.45	1.5	5.0	2.5	ECEA1HKS3R3()	200	2000	
	4.7	5.0	5.0	23	0.10	0.45	2.0	5.0	2.5	ECEA1HKS4R7()	200	2000	
	10	6.3	5.0	35	0.10	0.45	2.5	5.0	2.5	ECEA1HKS100()	200	2000	
	22	8.0	5.0	60	0.10	0.45	2.5	—	2.5	ECEA1HKS220()	200	1000	
			8.0	5.0	60	0.10	0.45	—	5.0	—	ECEA1HKS220Q	—	1000

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, i=2.5 mm.

• Please refer to the page of "Taping dimensions".

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.

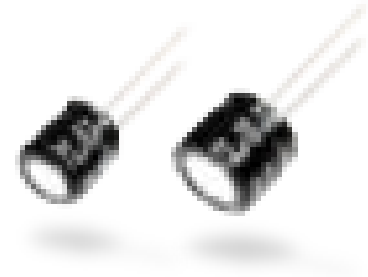
Should a safety concern arise regarding this product, please be sure to contact us immediately.

28-Feb-20

Aluminum Electrolytic Capacitors

Radial Lead Type

KS-A (Bi-polar) series



Features

- Endurance : 85 °C 1000 h
- 5 mm height
- RoHS compliant

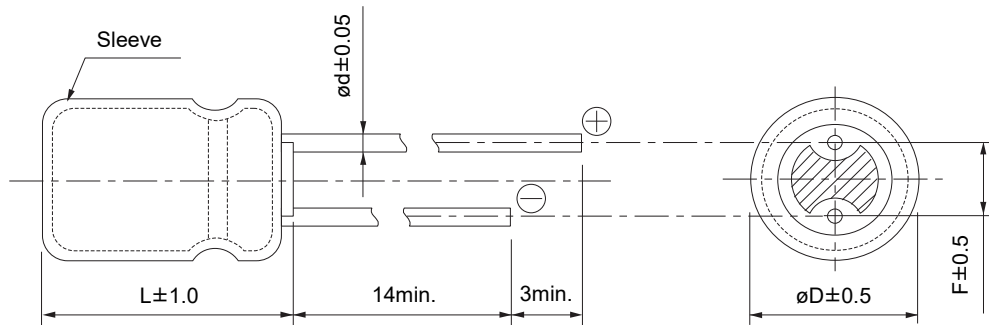
Specifications

Category temp. range	-40 °C to +85 °C	
Rated voltage range	6.3 V to 50 V	
Capacitance range	2.2 μF to 47 μF	
Capacitance tolerance	±20 % (120 Hz / +20°C)	
Leakage current	$I \leq 0.05 CV$ or 10 (μA) After 2 minutes (Whichever is greater)	
Dissipation factor (tan δ)	Please see the attached characteristics list	
Endurance	After 1000 h application of DC working voltage (500 h for each polarity) at +85 °C±2 °C, when the capacitors are restored to 20 °C, the capacitors shall meet the following limits.	
	Capacitance change	Within ±20 % of the initial value
	Dissipation factor (tan δ)	≤ 200 % of the initial limit
Shelf life	After storage for 1000 h at +85 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)	
	DC leakage current	Within the initial limit

Frequency correction factor for ripple current

Freq. (Hz)	50, 60	120	1 k	10 k to
Cap. (μF)				
2.2 to 47	0.70	1.00	1.30	1.70

Dimensions



	Unit : mm		
øD	4	5	6.3
ød	0.45	0.45	0.45
F	1.5	2.0	2.5

Characteristics list


Endurance : 85 °C 1000 h (500 h for each polarity)

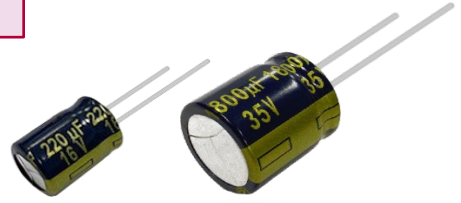
Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)				
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Lead dia. (ød)	Lead space			Straight	Taping *B	Taping *i	Straight leads	Taping
							Lead length	Lead length						
6.3	22	5.0	5.0	29	0.24	0.45	2.0	5.0	2.5	ECEA0JSN220()	200	2000		
	33	6.3	5.0	38	0.24	0.45	2.5	5.0	2.5	ECEA0JSN330()	200	2000		
	47	6.3	5.0	46	0.24	0.45	2.5	5.0	2.5	ECEA0JSN470()	200	2000		
10	10	4.0	5.0	25	0.20	0.45	1.5	5.0	2.5	ECEA1ASN100()	200	2000		
	22	6.3	5.0	35	0.20	0.45	2.5	5.0	2.5	ECEA1ASN220()	200	2000		
	33	6.3	5.0	43	0.20	0.45	2.5	5.0	2.5	ECEA1ASN330()	200	2000		
16	4.7	4.0	5.0	20	0.20	0.45	1.5	5.0	2.5	ECEA1CSN4R7()	200	2000		
	10	5.0	5.0	25	0.20	0.45	2.0	5.0	2.5	ECEA1CSN100()	200	2000		
	22	6.3	5.0	39	0.20	0.45	2.5	5.0	2.5	ECEA1CSN220()	200	2000		
25	3.3	5.0	5.0	18	0.20	0.45	2.0	5.0	2.5	ECEA1ESN3R3()	200	2000		
	4.7	5.0	5.0	21	0.20	0.45	2.0	5.0	2.5	ECEA1ESN4R7()	200	2000		
	10	6.3	5.0	28	0.20	0.45	2.5	5.0	2.5	ECEA1ESN100()	200	2000		
35	2.2	4.0	5.0	12	0.20	0.45	1.5	5.0	2.5	ECEA1VSN2R2()	200	2000		
50	2.2	5.0	5.0	16	0.20	0.45	2.0	5.0	2.5	ECEA1HSN2R2()	200	2000		

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

- When requesting taped product, please put the letter "B" or "i" between the "()".
Lead wire pitch *B=5 mm, i=2.5 mm.
- Please refer to the page of "Taping dimensions".

 Some part numbers are not recommended for new design.



Aluminum Electrolytic Capacitors

Radial Lead Type

FC-A series

■ Not available in Japan

Features

- Endurance : 105 °C 1000 h to 5000 h
- Low impedance
- AEC-Q200 compliant
- RoHS compliant

Specifications

Category temp. range	-55 °C to +105 °C									
Rated voltage range	6.3 V to 100 V									
Capacitance range	2.2 μF to 15000 μF									
Capacitance tolerance	±20 % (120 Hz / +20°C)									
Leakage current	I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)									
Dissipation factor (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	63	100	(120 Hz / +20°C)
	Dissipation factor (tan δ)	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.07	
For capacitance value ≥ 1000 μF, add 0.02 per every 1000 μF.										
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage)when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified below.									
	Duration ø4 to ø6.3 : 1000 h, ø8 : 2000 h, ø10 : 3000 h, ø12.5 to ø18 : 5000 h									
	Capacitance change	Within ±20 % of the initial value								
	Dissipation factor (tan δ)	≤ 200 % of the initial limit								
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance.									
	(With voltage treatment)									

Frequency correction factor for ripple current

Cap. (μF) \ Freq. (Hz)	60	120	1 k	10 k	100 k
2.2 to 330	0.55	0.65	0.85	0.90	1.00
390 to 1000	0.70	0.75	0.90	0.95	1.00
1200 to 2200	0.75	0.80	0.90	0.95	1.00
2700 to 15000	0.80	0.85	0.95	1.00	1.00

Dimensions

L^*
 $L \geq 16 : L \pm 1.0$ ($\phi 8 \times 15, \phi 16 \times 15, \phi 18 \times 15 : L \pm 1.5$)
 $L \geq 20 : L \pm 2.0$

Unit : mm

	L ≥ 11										L = 7		
øD	4.0	5.0	6.3	8.0	10.0	12.5	16.0	18.0	4.0	5.0	6.3		
L	—	—	—	—	—	15 to 25	30 to 35	—	—	—	—		
ød	0.45	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.45	0.45	0.45	
F	1.5	2.0	2.5	3.5	5.0	5.0	5.0	7.5	7.5	1.5	2.0	2.5	

Case size/ Impedance/ Ripple current

R. voltage Case size (mm) (\varnothing D×L)	6.3 V to 35 V			50 V			63 V			100 V		
	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)
	+20°C	-10°C		+20°C	-10°C		+20°C	-10°C		+20°C	-10°C	
4 × 7	2.00	5.00	65	—	—	—	—	—	—	—	—	—
5 × 7	0.950	2.40	120	—	—	—	—	—	—	—	—	—
6.3 × 7	0.450	1.20	200	—	—	—	—	—	—	—	—	—
5 × 11	0.800	1.60	175	*2	*2	*2	2.00	4.00	145	4.10	8.20	80
6.3 × 11.2	0.350	0.700	290	0.600	1.20	260	1.00	2.00	240	1.80	3.60	114
8 × 11.5	0.117	0.234	555	0.234	0.468	485	0.342	0.684	405	0.680	1.36	260
8 × 15	0.085	0.170	730	0.155	0.310	635	0.230	0.460	535	0.450	0.900	340
8 × 20	0.065	0.130	995	0.120	0.240	860	0.178	0.356	690	0.330	0.660	455
10 × 12.5	0.090	0.180	755	0.162	0.324	615	0.256	0.512	535	0.530	1.060	306
10 × 16	0.068	0.136	1050	0.119	0.238	850	0.194	0.388	600	0.360	0.720	400
10 × 20	0.052	0.104	1220	0.090	0.180	1030	0.147	0.294	885	0.240	0.480	463
10 × 25	0.045	0.090	1440	0.082	0.164	1200	0.130	0.260	1050	0.210	0.420	599
10 × 30	0.035	0.070	1815	0.060	0.120	1610	0.090	0.180	1300	0.150	0.300	698
12.5 × 15	0.065	0.130	1205	0.110	0.220	1150	0.150	0.300	1020	0.230	0.460	511
12.5 × 20	0.038	0.076	1655	0.063	0.126	1480	0.085	0.170	1285	0.180	0.360	671
12.5 × 25	0.030	0.060	1945	0.050	0.100	1832	0.070	0.140	1720	0.110	0.220	807
12.5 × 30	0.025	0.050	2310	0.040	0.080	2215	0.055	0.110	2090	0.098	0.196	937
12.5 × 35	0.022	0.044	2510	0.034	0.068	2285	0.047	0.094	2265	0.087	0.174	1040
12.5 × 40	0.018	0.036	2655	0.030	0.060	2590	0.042	0.084	2560	0.072	0.144	1130
16 × 15	0.043	0.086	1690	0.080	0.160	1610	0.090	0.180	1410	0.140	0.280	793
16 × 20	0.029	0.058	2205	0.048	0.096	1835	0.059	0.118	1765	0.110	0.220	995
16 × 25	0.022	0.044	2555	0.034	0.068	2235	0.050	0.100	2160	0.089	0.178	1170
16 × 31.5	0.018	0.036	3010	0.028	0.056	2700	0.043	0.086	2670	0.062	0.124	1520
16 × 35.5	0.016	0.032	3150	0.025	0.050	2790	0.036	0.072	2770	0.053	0.106	1730
16 × 40	0.015	0.030	3360	0.023	0.046	2845	0.030	0.060	2825	0.047	0.094	1920
18 × 15	0.038	0.076	2000	0.068	0.136	1900	0.086	0.172	1690	0.120	0.240	917
18 × 20	0.028	0.056	2490	0.042	0.084	2420	0.055	0.110	2290	0.080	0.160	1230
18 × 25	0.020	0.040	2740	0.029	0.058	2610	0.043	0.086	2585	0.070	0.140	1420
18 × 31.5	0.016	0.032	3635	0.025	0.050	3000	0.032	0.064	2950	0.062	0.124	1600
18 × 35.5	0.015	0.030	3680	0.023	0.046	3100	0.030	0.060	3095	0.041	0.082	1770
18 × 40	0.014	0.028	3735	—	—	—	0.025	0.050	3205	0.036	0.072	2300

*1: 100 kHz

*2

Case size (mm) (\varnothing D×L)	Capacitance (μ F)	Impedance (Ω) (100 kHz)		Ripple current (mA rms) (100 kHz)
		+20°C	-10°C	
5 × 11	2.2	1.80	3.60	45
	3.3	1.30	2.60	65
	4.7	1.30	2.60	95
	10	1.30	2.60	125
	12	1.30	2.60	135
	15	1.30	2.60	145
	18	1.30	2.60	155
	22	1.30	2.60	155

Characteristics list

Endurance : 105 °C 1000 h / ø4 to ø6.3, 105 °C 2000 h / ø8, 105 °C 3000 h / ø10, 105 °C 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current ^{*1} (mA rms)	Impe-dance ^{*2} (Ω)	Endu-rance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				Taping *H
6.3	27	4.0	7.0	65	2.000	1000	0.45	1.5	5.0	2.5	EEAFC0J270()	200	2000
	56	5.0	7.0	120	0.950	1000	0.45	2.0	5.0	2.5	EEAFC0J560()	200	2000
	100	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC0J101()	200	2000
	120	6.3	7.0	200	0.450	1000	0.45	2.5	5.0	2.5	EEAFC0J121()	200	2000
	220	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC0J221()	200	2000
	270	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC0J271()	200	2000
	330	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC0J331S()	200	2000
	390	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC0J391()	200	1000
	470	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC0J471()	200	1000
	560	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC0J561()	200	1000
	820	8.0	15.0	730	0.085	2000	0.60	3.5	5.0	—	EEUFC0J821L()	200	1000
		10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC0J821()	200	500
	1000	10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC0J102()	200	500
	1200	8.0	20.0	995	0.065	2000	0.60	3.5	5.0	—	EEUFC0J122L()	200	1000
		10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC0J122()	200	500
	1500	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC0J152()	200	500
		12.5	15.0	1205	0.065	5000	0.60	5.0	5.0	—	EEUFC0J152S()	200	500
	1800	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC0J182()	200	500
	2200	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC0J222()	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC0J222S()	100	250
	2700	10.0	30.0	1815	0.035	3000	0.60	5.0	—	—	EEUFC0J272L	100	—
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC0J272()	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC0J272S()	100	250
	3300	12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC0J332()	200	500
		18.0	15.0	2000	0.038	5000	0.80	7.5	7.5	—	EEUFC0J332S()	100	250
	3900	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC0J392()	200	500
	4700	12.5	30.0	2310	0.025	5000	0.80	5.0	—	—	EEUFC0J472	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC0J472S()	100	250
	5600	12.5	35.0	2510	0.022	5000	0.80	5.0	—	—	EEUFC0J562L	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC0J562()	100	250
NRFND 6800	12.5	40.0	2655	0.018	5000	0.80	5.0	—	—	EEUFC0J682L	100	—	
6800	16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC0J682()	100	250	
	18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC0J682S()	100	250	
8200	16.0	31.5	3010	0.018	5000	0.80	7.5	—	—	EEUFC0J822	100	—	
NRFND 10000	16.0	35.5	3150	0.016	5000	0.80	7.5	—	—	EEUFC0J103	100	—	
10000	18.0	25.0	2740	0.020	5000	0.80	7.5	7.5	—	EEUFC0J103S()	100	250	
NRFND 12000	16.0	40.0	3360	0.015	5000	0.80	7.5	—	—	EEUFC0J123L	100	—	
12000	18.0	31.5	3635	0.016	5000	0.80	7.5	—	—	EEUFC0J123	50	—	
15000	18.0	35.5	3680	0.015	5000	0.80	7.5	—	—	EEUFC0J153	50	—	

*1: Ripple current (100 kHz / +105 °C)

NRFND Not recommended for new design

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 1000 h / ø4 to ø6.3, 105 °C 2000 h / ø8, 105 °C 3000 h / ø10, 105 °C 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current ^{*1} (mA rms)	Impe-dance ^{*2} (Ω)	Endu-rance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				Taping *H
10	22	4.0	7.0	65	2.000	1000	0.45	1.5	5.0	2.5	EEAFC1A220()	200	2000
	39	5.0	7.0	120	0.950	1000	0.45	2.0	5.0	2.5	EEAFC1A390()	200	2000
	82	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1A820()	200	2000
		6.3	7.0	200	0.450	1000	0.45	2.5	5.0	2.5	EEAFC1A820()	200	2000
	100	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1A101S()	200	2000
	150	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1A151()	200	2000
	180	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1A181()	200	2000
	220	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1A221S()	200	2000
	330	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1A331()	200	1000
	390	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1A391()	200	1000
	470	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1A471()	200	1000
	560	10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1A561()	200	500
	680	8.0	15.0	730	0.085	2000	0.60	3.5	5.0	—	EEUFC1A681L()	200	1000
		10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1A681()	200	500
	820	10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1A821()	200	500
	1000	8.0	20.0	995	0.065	2000	0.60	3.5	5.0	—	EEUFC1A102L()	200	1000
		10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1A102()	200	500
	1200	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1A122()	200	500
		12.5	15.0	1205	0.065	5000	0.60	5.0	5.0	—	EEUFC1A122S()	200	500
	1500	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC1A152()	200	500
	1800	12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1A182()	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC1A182S()	100	250
	2200	10.0	30.0	1815	0.035	3000	0.60	5.0	—	—	EEUFC1A222L	100	—
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1A222()	200	500
	2700	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1A272()	200	500
		18.0	15.0	2000	0.038	5000	0.80	7.5	7.5	—	EEUFC1A272S()	100	250
	3300	12.5	30.0	2310	0.025	5000	0.80	5.0	—	—	EEUFC1A332	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1A332S()	100	250
	3900	12.5	35.0	2510	0.022	5000	0.80	5.0	—	—	EEUFC1A392L	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1A392()	100	250
NRFND	4700	12.5	40.0	2655	0.018	5000	0.80	5.0	—	—	EEUFC1A472L	100	—
4700	16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1A472()	100	250	
5600	16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1A562()	100	250	
	18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1A562S()	100	250	
6800	16.0	31.5	3010	0.018	5000	0.80	7.5	—	—	EEUFC1A682	100	—	
	18.0	25.0	2740	0.020	5000	0.80	7.5	7.5	—	EEUFC1A682S()	100	250	
NRFND	8200	16.0	35.5	3150	0.016	5000	0.80	7.5	—	—	EEUFC1A822L	100	—
8200	18.0	31.5	3635	0.016	5000	0.80	7.5	—	—	EEUFC1A822	50	—	
10000	18.0	35.5	3680	0.015	5000	0.80	7.5	—	—	EEUFC1A103	50	—	
12000	18.0	40.0	3735	0.014	5000	0.80	7.5	—	—	EEUFC1A123	50	—	

*1: Ripple current (100 kHz / +105 °C)

*2: Impedance (100 kHz / +20 °C)

NRFND Not recommended for new design

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 1000 h / ø4 to ø6.3, 105 °C 2000 h / ø8, 105 °C 3000 h / ø10, 105 °C 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (µF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current ^{*1} (mA rms)	Impedance ^{*2} (Ω)	Endurance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				Taping *H
16	15	4.0	7.0	65	2.000	1000	0.45	1.5	5.0	2.5	EEAFC1C150()	200	2000
	27	5.0	7.0	120	0.950	1000	0.45	2.0	5.0	2.5	EEAFC1C270()	200	2000
	47	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1C470()	200	2000
	56	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1C560()	200	2000
		6.3	7.0	200	0.450	1000	0.45	2.5	5.0	2.5	EEAFC1C560()	200	2000
	68	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1C680()	200	2000
	100	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1C101()	200	2000
	120	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1C121()	200	2000
	220	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1C221()	200	1000
	270	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1C271()	200	1000
	330	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1C331()	200	1000
	390	10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1C391()	200	500
	470	8.0	15.0	730	0.085	2000	0.60	3.5	5.0	—	EEUFC1C471L()	200	1000
		10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1C471()	200	500
	560	10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1C561()	200	500
	680	8.0	20.0	995	0.065	2000	0.60	3.5	5.0	—	EEUFC1C681L()	200	1000
		10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1C681()	200	500
	820	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1C821()	200	500
		12.5	15.0	1205	0.065	5000	0.60	5.0	5.0	—	EEUFC1C821S()	200	500
	1000	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1C102S()	200	500
		10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC1C102()	200	500
	1200	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC1C122()	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC1C122S()	100	250
	1500	10.0	30.0	1815	0.035	3000	0.60	5.0	—	—	EEUFC1C152L	100	—
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1C152()	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC1C152S()	100	250
	1800	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1C182()	200	500
		18.0	15.0	2000	0.038	5000	0.80	7.5	7.5	—	EEUFC1C182S()	100	250
	2200	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1C222()	200	500
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1C222S()	100	250
	2700	12.5	30.0	2310	0.025	5000	0.80	5.0	—	—	EEUFC1C272L	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1C272()	100	250
3300	12.5	35.0	2510	0.022	5000	0.80	5.0	—	—	EEUFC1C332	100	—	
	18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1C332S()	100	250	
3900	16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1C392()	100	250	
	18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1C392S()	100	250	
4700	16.0	31.5	3010	0.018	5000	0.80	7.5	—	—	EEUFC1C472	100	—	
	18.0	25.0	2740	0.020	5000	0.80	7.5	7.5	—	EEUFC1C472S()	100	250	
NRFND	5600	16.0	35.5	3150	0.016	5000	0.80	7.5	—	—	EEUFC1C562L	100	—
	5600	18.0	31.5	3635	0.016	5000	0.80	7.5	—	—	EEUFC1C562	50	—
NRFND	6800	16.0	40.0	3360	0.015	5000	0.80	7.5	—	—	EEUFC1C682	100	—
	8200	18.0	35.5	3680	0.015	5000	0.80	7.5	—	—	EEUFC1C822	50	—

*1: Ripple current (100 kHz / +105 °C)

NRFND Not recommended for new design

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 1000 h / ϕ 4 to ϕ 6.3, 105 °C 2000 h / ϕ 8, 105 °C 3000 h / ϕ 10, 105 °C 5000 h / ϕ 12.5 to ϕ 18

Rated voltage (V)	Capacitance ($\pm 20\%$) (μ F)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		ϕ D	L	Ripple current ^{*1} (mA rms)	Impe-dance ^{*2} (Ω)	Endu-rance (h)	Lead dia. (ϕ d)	Lead space			Straight leads	Taping	
								Straight	Taping *B				Taping *H
25	10	4.0	7.0	65	2.000	1000	0.45	1.5	5.0	2.5	EEAFC1E100()	200	2000
	22	5.0	7.0	120	0.950	1000	0.45	2.0	5.0	2.5	EEAFC1E220()	200	2000
	39	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1E390()	200	2000
		6.3	7.0	200	0.450	1000	0.45	2.5	5.0	2.5	EEAFC1E390()	200	2000
	47	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1E470()	200	2000
	82	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1E820()	200	2000
	100	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1E101S()	200	2000
	180	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1E181()	200	1000
	220	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1E221()	200	1000
	270	10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1E271()	200	500
	330	8.0	15.0	730	0.085	2000	0.60	3.5	5.0	—	EEUFC1E331L()	200	1000
		10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1E331()	200	500
	390	10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1E391()	200	500
	470	8.0	20.0	995	0.065	2000	0.60	3.5	5.0	—	EEUFC1E471L()	200	1000
		10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1E471()	200	500
	560	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1E561()	200	500
		12.5	15.0	1205	0.065	5000	0.60	5.0	5.0	—	EEUFC1E561S()	200	500
	680	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1E681()	200	500
	820	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC1E821()	200	500
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1E821S()	200	500
	1000	10.0	30.0	1815	0.035	3000	0.60	5.0	—	—	EEUFC1E102L	100	—
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1E102()	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC1E102S()	100	250
	1200	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1E122()	200	500
		18.0	15.0	2000	0.038	5000	0.80	7.5	7.5	—	EEUFC1E122S()	100	250
	1500	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1E152()	200	500
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1E152S()	100	250
	1800	12.5	30.0	2310	0.025	5000	0.80	5.0	—	—	EEUFC1E182L	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1E182()	100	250
	2200	12.5	35.0	2510	0.022	5000	0.80	5.0	—	—	EEUFC1E222	100	—
18.0		20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1E222S()	100	250	
2700	16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1E272()	100	250	
3300	16.0	31.5	3010	0.018	5000	0.80	7.5	—	—	EEUFC1E332	100	—	
	18.0	25.0	2740	0.020	5000	0.80	7.5	7.5	—	EEUFC1E332S()	100	250	
NRFND 3900	16.0	35.5	3150	0.016	5000	0.80	7.5	—	—	EEUFC1E392L	100	—	
3900	18.0	31.5	3635	0.016	5000	0.80	7.5	—	—	EEUFC1E392	50	—	
4700	18.0	35.5	3680	0.015	5000	0.80	7.5	—	—	EEUFC1E472	50	—	
5600	18.0	40.0	3735	0.014	5000	0.80	7.5	—	—	EEUFC1E562	50	—	

*1: Ripple current (100 kHz / +105 °C)

NRFND Not recommended for new design

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 1000 h / ø4 to ø6.3, 105 °C 2000 h / ø8, 105 °C 3000 h / ø10, 105 °C 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current ^{*1} (mA rms)	Impe-dance ^{*2} (Ω)	Endu-rance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				Taping *H
35	6.8	4.0	7.0	65	2.000	1000	0.45	1.5	5.0	2.5	EEAFC1V6R8()	200	2000
	12	5.0	7.0	120	0.950	1000	0.45	2.0	5.0	2.5	EEAFC1V120()	200	2000
	22	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1V220()	200	2000
	27	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1V270()	200	2000
		6.3	7.0	200	0.450	1000	0.45	2.5	5.0	2.5	EEAFC1V270()	200	2000
	33	5.0	11.0	175	0.800	1000	0.50	2.0	5.0	2.5	EEUFC1V330()	200	2000
	47	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1V470()	200	2000
	56	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1V560()	200	2000
	68	6.3	11.2	290	0.350	1000	0.50	2.5	5.0	2.5	EEUFC1V680()	200	2000
	100	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1V101()	200	1000
	120	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1V121()	200	1000
	150	8.0	11.5	555	0.117	2000	0.60	3.5	5.0	—	EEUFC1V151()	200	1000
	180	10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1V181()	200	500
	220	8.0	15.0	730	0.085	2000	0.60	3.5	5.0	—	EEUFC1V221L()	200	1000
		10.0	12.5	755	0.090	3000	0.60	5.0	5.0	—	EEUFC1V221()	200	500
	270	10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1V271()	200	500
	330	8.0	20.0	995	0.065	2000	0.60	3.5	5.0	—	EEUFC1V331L()	200	1000
		10.0	16.0	1050	0.068	3000	0.60	5.0	5.0	—	EEUFC1V331()	200	500
	390	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1V391()	200	500
		12.5	15.0	1205	0.065	5000	0.60	5.0	5.0	—	EEUFC1V391S()	200	500
	470	10.0	20.0	1220	0.052	3000	0.60	5.0	5.0	—	EEUFC1V471()	200	500
	560	10.0	25.0	1440	0.045	3000	0.60	5.0	5.0	—	EEUFC1V561()	200	500
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1V561S()	200	500
	680	10.0	30.0	1815	0.035	3000	0.60	5.0	—	—	EEUFC1V681L	100	—
		12.5	20.0	1655	0.038	5000	0.60	5.0	5.0	—	EEUFC1V681()	200	500
		16.0	15.0	1690	0.043	5000	0.80	7.5	7.5	—	EEUFC1V681S()	100	250
	820	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1V821L()	200	500
		18.0	15.0	2000	0.038	5000	0.80	7.5	7.5	—	EEUFC1V821()	100	250
	1000	12.5	25.0	1945	0.030	5000	0.60	5.0	5.0	—	EEUFC1V102()	200	500
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1V102S()	100	250
	1200	12.5	30.0	2310	0.025	5000	0.80	5.0	—	—	EEUFC1V122L	100	—
		16.0	20.0	2205	0.029	5000	0.80	7.5	7.5	—	EEUFC1V122()	100	250
	1500	12.5	35.0	2510	0.022	5000	0.80	5.0	—	—	EEUFC1V152L	100	—
		16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1V152()	100	250
		18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1V152S()	100	250
NRFND 1800	12.5	40.0	2655	0.018	5000	0.80	5.0	—	—	EEUFC1V182L	100	—	
1800	16.0	25.0	2555	0.022	5000	0.80	7.5	7.5	—	EEUFC1V182()	100	250	
	18.0	20.0	2490	0.028	5000	0.80	7.5	7.5	—	EEUFC1V182S()	100	250	
2200	16.0	31.5	3010	0.018	5000	0.80	7.5	—	—	EEUFC1V222	100	—	
	18.0	25.0	2740	0.020	5000	0.80	7.5	7.5	—	EEUFC1V222S()	100	250	
NRFND 2700	16.0	35.5	3150	0.016	5000	0.80	7.5	—	—	EEUFC1V272L	100	—	
2700	18.0	31.5	3635	0.016	5000	0.80	7.5	—	—	EEUFC1V272	50	—	
3300	18.0	35.5	3680	0.015	5000	0.80	7.5	—	—	EEUFC1V332	50	—	
3900	18.0	40.0	3735	0.014	5000	0.80	7.5	—	—	EEUFC1V392	50	—	

*1: Ripple current (100 kHz / +105 °C)

NRFND Not recommended for new design

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 1000 h / ø4 to ø6.3, 105 °C 2000 h / ø8, 105 °C 3000 h / ø10, 105 °C 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (µF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current ^{*1} (mA rms)	Impedance ^{*2} (Ω)	Endurance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				Taping *H
50	2.2	5.0	11.0	45	1.800	1000	0.50	2.0	5.0	2.5	EEUFC1H2R2()	200	2000
	3.3	5.0	11.0	65	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H3R3()	200	2000
	4.7	5.0	11.0	95	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H4R7()	200	2000
	10	5.0	11.0	125	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H100L()	200	2000
	12	5.0	11.0	135	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H120()	200	2000
	15	5.0	11.0	145	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H150()	200	2000
	18	5.0	11.0	155	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H180()	200	2000
	22	5.0	11.0	155	1.300	1000	0.50	2.0	5.0	2.5	EEUFC1H220()	200	2000
	33	6.3	11.2	260	0.600	1000	0.50	2.5	5.0	2.5	EEUFC1H330()	200	2000
	39	6.3	11.2	260	0.600	1000	0.50	2.5	5.0	2.5	EEUFC1H390()	200	2000
	47	6.3	11.2	260	0.600	1000	0.50	2.5	5.0	2.5	EEUFC1H470()	200	2000
	68	8.0	11.5	485	0.234	2000	0.60	3.5	5.0	—	EEUFC1H680()	200	1000
	82	8.0	11.5	485	0.234	2000	0.60	3.5	5.0	—	EEUFC1H820()	200	1000
	100	10.0	12.5	615	0.162	3000	0.60	5.0	5.0	—	EEUFC1H101()	200	500
	120	8.0	15.0	635	0.155	2000	0.60	3.5	5.0	—	EEUFC1H121L()	200	1000
		10.0	12.5	615	0.162	3000	0.60	5.0	5.0	—	EEUFC1H121()	200	500
	150	10.0	16.0	850	0.119	3000	0.60	5.0	5.0	—	EEUFC1H151()	200	500
	180	8.0	20.0	860	0.120	2000	0.60	3.5	5.0	—	EEUFC1H181L()	200	1000
		10.0	16.0	850	0.119	3000	0.60	5.0	5.0	—	EEUFC1H181()	200	500
	220	10.0	20.0	1030	0.090	3000	0.60	5.0	5.0	—	EEUFC1H221()	200	500
		12.5	15.0	1150	0.110	5000	0.60	5.0	5.0	—	EEUFC1H221S()	200	500
	270	10.0	25.0	1200	0.082	3000	0.60	5.0	5.0	—	EEUFC1H271()	200	500
	330	10.0	30.0	1610	0.060	3000	0.60	5.0	—	—	EEUFC1H331L	100	—
		12.5	20.0	1480	0.063	5000	0.60	5.0	5.0	—	EEUFC1H331()	200	500
	390	12.5	20.0	1480	0.063	5000	0.60	5.0	5.0	—	EEUFC1H391()	200	500
		16.0	15.0	1610	0.080	5000	0.80	7.5	7.5	—	EEUFC1H391S()	100	250
	470	10.0	30.0	1610	0.060	3000	0.60	5.0	—	—	EEUFC1H471L	100	—
		12.5	25.0	1832	0.050	5000	0.60	5.0	5.0	—	EEUFC1H471()	200	500
560	12.5	25.0	1832	0.050	5000	0.60	5.0	5.0	—	EEUFC1H561()	200	500	
	18.0	15.0	1900	0.068	5000	0.80	7.5	7.5	—	EEUFC1H561S()	100	250	
680	12.5	30.0	2215	0.040	5000	0.80	5.0	—	—	EEUFC1H681L	100	—	
	16.0	20.0	1835	0.048	5000	0.80	7.5	7.5	—	EEUFC1H681()	100	250	
820	12.5	35.0	2285	0.034	5000	0.80	5.0	—	—	EEUFC1H821L	100	—	
	18.0	20.0	2420	0.042	5000	0.80	7.5	7.5	—	EEUFC1H821()	100	250	
NRFND 1000	12.5	40.0	2590	0.030	5000	0.80	5.0	—	—	EEUFC1H102L	100	—	
1000	16.0	25.0	2235	0.034	5000	0.80	7.5	7.5	—	EEUFC1H102()	100	250	
1200	16.0	31.5	2700	0.028	5000	0.80	7.5	—	—	EEUFC1H122	100	—	
	18.0	25.0	2610	0.029	5000	0.80	7.5	7.5	—	EEUFC1H122S()	100	250	
NRFND 1500	16.0	35.5	2790	0.025	5000	0.80	7.5	—	—	EEUFC1H152L	100	—	
NRFND 1800	16.0	40.0	2845	0.023	5000	0.80	7.5	—	—	EEUFC1H182L	100	—	
1800	18.0	31.5	3000	0.025	5000	0.80	7.5	—	—	EEUFC1H182	50	—	
2200	18.0	35.5	3100	0.023	5000	0.80	7.5	—	—	EEUFC1H222	50	—	

*1: Ripple current (100 kHz / +105 °C)

NRFND Not recommended for new design

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 1000 h / ø4 to ø6.3, 105 °C 2000 h / ø8, 105 °C 3000 h / ø10, 105 °C 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current ^{*1} (mA rms)	Impe-dance ^{*2} (Ω)	Endu-rance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				Taping *H
63	12	5.0	11.0	145	2.000	1000	0.50	2.0	5.0	2.5	EEUFC1J120()	200	2000
	22	6.3	11.2	240	1.000	1000	0.50	2.5	5.0	2.5	EEUFC1J220()	200	2000
	33	6.3	11.2	240	1.000	1000	0.50	2.5	5.0	2.5	EEUFC1J330()	200	2000
	47	8.0	11.5	405	0.342	2000	0.60	3.5	5.0	—	EEUFC1J470()	200	1000
	56	8.0	11.5	405	0.342	2000	0.60	3.5	5.0	—	EEUFC1J560()	200	1000
	68	8.0	11.5	405	0.342	2000	0.60	3.5	5.0	—	EEUFC1J680()	200	1000
	82	10.0	12.5	535	0.256	3000	0.60	5.0	5.0	—	EEUFC1J820()	200	500
	100	8.0	15.0	535	0.230	2000	0.60	3.5	5.0	—	EEUFC1J101L()	200	1000
		10.0	12.5	535	0.256	3000	0.60	5.0	5.0	—	EEUFC1J101()	200	500
	120	10.0	16.0	600	0.194	3000	0.60	5.0	5.0	—	EEUFC1J121()	200	500
	150	8.0	20.0	690	0.178	2000	0.60	3.5	5.0	—	EEUFC1J151()	200	1000
	180	10.0	20.0	885	0.147	3000	0.60	5.0	5.0	—	EEUFC1J181()	200	500
		12.5	15.0	1020	0.150	5000	0.60	5.0	5.0	—	EEUFC1J181S()	200	500
	220	10.0	20.0	885	0.147	3000	0.60	5.0	5.0	—	EEUFC1J221X()	200	500
		10.0	25.0	1050	0.130	3000	0.60	5.0	5.0	—	EEUFC1J221()	200	500
		12.5	20.0	1285	0.085	5000	0.60	5.0	5.0	—	EEUFC1J221S()	200	500
	270	16.0	15.0	1410	0.090	5000	0.80	7.5	7.5	—	EEUFC1J271()	100	250
	330	10.0	30.0	1300	0.090	3000	0.60	5.0	—	—	EEUFC1J331L	100	—
		12.5	20.0	1285	0.085	5000	0.60	5.0	5.0	—	EEUFC1J331()	200	500
	390	12.5	25.0	1720	0.070	5000	0.60	5.0	5.0	—	EEUFC1J391()	200	500
		18.0	15.0	1690	0.086	5000	0.80	7.5	7.5	—	EEUFC1J391S()	100	250
	470	12.5	30.0	2090	0.055	5000	0.80	5.0	—	—	EEUFC1J471L	100	—
		16.0	20.0	1765	0.059	5000	0.80	7.5	7.5	—	EEUFC1J471()	100	250
	560	16.0	25.0	2160	0.050	5000	0.80	7.5	7.5	—	EEUFC1J561()	100	250
	680	12.5	35.0	2265	0.047	5000	0.80	5.0	—	—	EEUFC1J681L	100	—
		16.0	25.0	2160	0.050	5000	0.80	7.5	7.5	—	EEUFC1J681()	100	250
		18.0	20.0	2290	0.055	5000	0.80	7.5	7.5	—	EEUFC1J681S()	100	250
	NRFND 820	12.5	40.0	2560	0.042	5000	0.80	5.0	—	—	EEUFC1J821L	100	—
820	16.0	31.5	2670	0.043	5000	0.80	7.5	—	—	EEUFC1J821	100	—	
	18.0	25.0	2585	0.043	5000	0.80	7.5	7.5	—	EEUFC1J821S()	100	250	
1000	16.0	31.5	2670	0.043	5000	0.80	7.5	—	—	EEUFC1J102U	100	—	
NRFND 1000	16.0	35.5	2770	0.036	5000	0.80	7.5	—	—	EEUFC1J102	100	—	
NRFND 1200	16.0	40.0	2825	0.030	5000	0.80	7.5	—	—	EEUFC1J122L	100	—	
1200	18.0	31.5	2950	0.032	5000	0.80	7.5	—	—	EEUFC1J122	50	—	
1500	18.0	35.5	3095	0.030	5000	0.80	7.5	—	—	EEUFC1J152	50	—	
1800	18.0	40.0	3205	0.025	5000	0.80	7.5	—	—	EEUFC1J182	50	—	

*1: Ripple current (100 kHz / +105 °C)

NRFND Not recommended for new design

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 1000 h / ø4 to ø6.3, 105 °C 2000 h / ø8, 105 °C 3000 h / ø10, 105 °C 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impedance ^{*2} (Ω)	Endurance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
100	5.6	5.0	11.0	80	4.100	1000	0.5	2.0	5.0	2.5	EEUFC2A5R6()	200	2000
	12	6.3	11.2	114	1.800	1000	0.5	2.5	5.0	2.5	EEUFC2A120()	200	2000
	22	8.0	11.5	260	0.680	2000	0.6	3.5	5.0	—	EEUFC2A220()	200	1000
	33	8.0	15.0	340	0.450	2000	0.6	3.5	5.0	—	EEUFC2A330L()	200	1000
		10.0	12.5	306	0.530	3000	0.6	5.0	5.0	—	EEUFC2A330()	200	500
	39	8.0	20.0	455	0.330	2000	0.6	5.0	5.0	—	EEUFC2A390L()	200	1000
		10.0	16.0	400	0.360	3000	0.6	5.0	5.0	—	EEUFC2A390()	200	500
	47	10.0	20.0	463	0.240	3000	0.6	5.0	5.0	—	EEUFC2A470()	200	500
	56	10.0	20.0	463	0.240	3000	0.6	5.0	5.0	—	EEUFC2A560()	200	500
	68	10.0	25.0	599	0.210	3000	0.6	5.0	5.0	—	EEUFC2A680L()	200	500
		12.5	15.0	511	0.230	5000	0.6	5.0	5.0	—	EEUFC2A680()	200	500
	100	10.0	30.0	698	0.150	3000	0.6	5.0	—	—	EEUFC2A101L	100	—
		12.5	20.0	671	0.180	5000	0.6	5.0	5.0	—	EEUFC2A101()	200	500
	120	16.0	15.0	793	0.140	5000	0.8	7.5	7.5	—	EEUFC2A121S()	100	250
	150	12.5	25.0	807	0.110	5000	0.6	5.0	5.0	—	EEUFC2A151()	200	500
		18.0	15.0	917	0.120	5000	0.8	7.5	7.5	—	EEUFC2A151S()	100	250
	180	12.5	30.0	937	0.098	5000	0.8	5.0	—	—	EEUFC2A181L	100	—
		16.0	20.0	995	0.110	5000	0.8	7.5	7.5	—	EEUFC2A181()	100	250
	220	12.5	35.0	1040	0.087	5000	0.8	5.0	—	—	EEUFC2A221L	100	—
		16.0	25.0	1170	0.089	5000	0.8	7.5	7.5	—	EEUFC2A221()	100	250
NRFND	270	12.5	40.0	1130	0.072	5000	0.8	5.0	—	—	EEUFC2A271L	100	—
270	18.0	20.0	1230	0.080	5000	0.8	7.5	7.5	—	EEUFC2A271S()	100	250	
330	16.0	31.5	1520	0.062	5000	0.8	7.5	—	—	EEUFC2A331	100	—	
	18.0	25.0	1420	0.070	5000	0.8	7.5	7.5	—	EEUFC2A331S()	100	250	
NRFND	390	16.0	35.5	1730	0.053	5000	0.8	7.5	—	—	EEUFC2A391L	100	—
390	18.0	31.5	1600	0.062	5000	0.8	7.5	—	—	EEUFC2A391	50	—	
NRFND	470	16.0	40.0	1920	0.047	5000	0.8	7.5	—	—	EEUFC2A471	100	—
560	18.0	35.5	1770	0.041	5000	0.8	7.5	—	—	EEUFC2A561	50	—	
680	18.0	40.0	2300	0.036	5000	0.8	7.5	—	—	EEUFC2A681	50	—	

*1: Ripple current (100 kHz / +105 °C)

NRFND Not recommended for new design

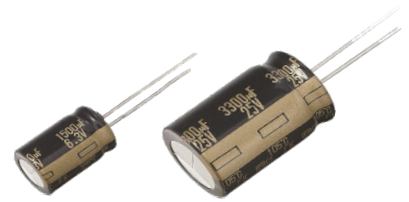
*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

 Some part numbers are not recommended for new design.



Aluminum Electrolytic Capacitors

Radial Lead Type

FK-A series

■ Not available in Japan

Features

- Endurance : 105 °C 3000 h to 5000 h
- Low impedance (10 % to 30 % less than FC Series)
- Miniaturization (30 % to 40 % less than FC Series)
- AEC-Q200 compliant
- RoHS compliant

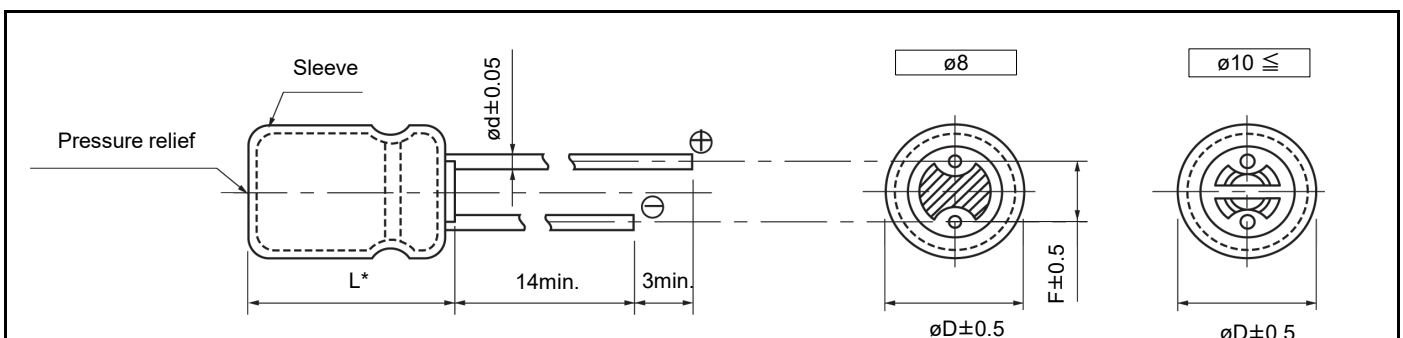
Specifications

Category temp. range	-55 °C to +105 °C						
Rated voltage range	6.3 V to 35 V						
Capacitance range	180 µF to 12000 µF						
Capacitance tolerance	±20 % (120 Hz / +20°C)						
Leakage current	$I \leq 0.01 CV (\mu A)$ After 2 minutes						
Dissipation factor (tan δ)	Rated voltage (V)	6.3	10	16	25	35	(120 Hz / +20°C)
	Dissipation factor (tan δ)	0.22	0.19	0.16	0.14	0.12	
For capacitance value ≥ 1000 µF, add 0.02 per every 1000 µF.							
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage)when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow.						
	Duration ø8 : 3000 h, ø10 : 4000 h, ø12.5 to ø18 : 5000 h						
	Capacitance change	Within ±20 % of the initial value					
	Dissipation factor (tan δ)	≤ 200 % of the initial limit					
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance.						
	(With voltage treatment)						

Frequency correction factor for ripple current

Cap. (µF) \ Freq. (Hz)	60	120	1 k	10 k	100 k
180 to 330	0.60	0.70	0.85	0.95	1.00
390 to 1000	0.65	0.75	0.90	0.98	1.00
1200 to 12000	0.75	0.80	0.95	1.00	1.00

Dimensions



* $L \leq 16 : L \pm 1.5$
 $L \geq 20 : L \pm 2.0$

	Unit : mm					
øD	8.0	10.0	12.5		16.0	18.0
L	—	—	12.5 to 25	30 to 35	—	—
ød	0.6	0.6	0.6	0.8	0.8	0.8
F	3.5	5.0	5.0	5.0	7.5	7.5

Case size / Impedance / Ripple current			
Case size (mm) (\varnothing D×L)	Impedance (Ω) (100 kHz)		Ripple current (mA rms) (100 kHz)
	+20 °C	-10 °C	+105 °C
8 × 11.5	0.090	0.180	630
8 × 15	0.062	0.124	860
8 × 20	0.044	0.088	1220
10 × 12.5	0.063	0.126	900
10 × 16	0.049	0.098	1240
10 × 20	0.035	0.070	1490
10 × 25	0.033	0.066	1680
10 × 30	0.025	0.050	2140
12.5 × 15	0.048	0.096	1400
12.5 × 20	0.029	0.058	1890
12.5 × 25	0.022	0.044	2280
12.5 × 30	0.018	0.036	2720
12.5 × 35	0.016	0.032	2940
12.5 × 40	0.014	0.028	3010
16 × 15	0.038	0.076	1800
16 × 20	0.026	0.052	2330
16 × 25	0.019	0.038	2760
18 × 15	0.036	0.072	2060
18 × 20	0.025	0.050	2640
18 × 25	0.018	0.036	2850

Characteristics list

Endurance : 105 °C 3000 h / ø8, 105 °C 4000 h / ø10, 105 °C 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impe-dance ^{*2} (Ω)	Endu-rance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping
								Straight	Taping *B			
6.3	680	8.0	11.5	630	0.090	3000	0.6	3.5	5.0	EEUFK0J681()	200	1000
	1000	8.0	15.0	860	0.062	3000	0.6	3.5	5.0	EEUFK0J102L()	200	1000
		10.0	12.5	900	0.063	4000	0.6	5.0	5.0	EEUFK0J102()	200	500
	1500	8.0	20.0	1220	0.044	3000	0.6	3.5	5.0	EEUFK0J152L()	200	1000
		10.0	16.0	1240	0.049	4000	0.6	5.0	5.0	EEUFK0J152()	200	500
	1800	12.5	15.0	1400	0.048	5000	0.6	5.0	5.0	EEUFK0J182S()	200	500
	2200	10.0	20.0	1490	0.035	4000	0.6	5.0	5.0	EEUFK0J222()	200	500
		10.0	25.0	1680	0.033	4000	0.6	5.0	5.0	EEUFK0J222L()	200	500
	3300	10.0	30.0	2140	0.025	4000	0.6	5.0	—	EEUFK0J332L	100	—
		12.5	20.0	1890	0.029	5000	0.6	5.0	5.0	EEUFK0J332()	200	500
		16.0	15.0	1800	0.038	5000	0.8	7.5	7.5	EEUFK0J332S()	100	250
	4700	12.5	25.0	2280	0.022	5000	0.6	5.0	5.0	EEUFK0J472()	200	500
		18.0	15.0	2060	0.036	5000	0.8	7.5	7.5	EEUFK0J472S()	100	250
	5600	12.5	30.0	2720	0.018	5000	0.8	5.0	—	EEUFK0J562L	100	—
		16.0	20.0	2330	0.026	5000	0.8	7.5	7.5	EEUFK0J562S()	100	250
	6800	12.5	35.0	2940	0.016	5000	0.8	5.0	—	EEUFK0J682L	100	—
NRFND	8200	12.5	40.0	3010	0.014	5000	0.8	5.0	—	EEUFK0J822L	100	—
8200	16.0	25.0	2760	0.019	5000	0.8	7.5	7.5	EEUFK0J822()	100	250	
	18.0	20.0	2640	0.025	5000	0.8	7.5	7.5	EEUFK0J822S()	100	250	
12000	18.0	25.0	2850	0.018	5000	0.8	7.5	7.5	EEUFK0J123S()	100	250	
10	560	8.0	11.5	630	0.090	3000	0.6	3.5	5.0	EEUFK1A561()	200	1000
	820	8.0	15.0	860	0.062	3000	0.6	3.5	5.0	EEUFK1A821L()	200	1000
		10.0	12.5	900	0.063	4000	0.6	5.0	5.0	EEUFK1A821()	200	500
	1200	8.0	20.0	1220	0.044	3000	0.6	3.5	5.0	EEUFK1A122L()	200	1000
		10.0	16.0	1240	0.049	4000	0.6	5.0	5.0	EEUFK1A122()	200	500
	1500	12.5	15.0	1400	0.048	5000	0.6	5.0	5.0	EEUFK1A152S()	200	500
	1800	10.0	20.0	1490	0.035	4000	0.6	5.0	5.0	EEUFK1A182()	200	500
		10.0	25.0	1680	0.033	4000	0.6	5.0	5.0	EEUFK1A182L()	200	500
	2700	10.0	30.0	2140	0.025	4000	0.6	5.0	—	EEUFK1A272L	100	—
		12.5	20.0	1890	0.029	5000	0.6	5.0	5.0	EEUFK1A272()	200	500
		16.0	15.0	1800	0.038	5000	0.8	7.5	7.5	EEUFK1A272S()	100	250
	3900	12.5	25.0	2280	0.022	5000	0.6	5.0	5.0	EEUFK1A392()	200	500
		18.0	15.0	2060	0.036	5000	0.8	7.5	7.5	EEUFK1A392S()	100	250
	4700	12.5	30.0	2720	0.018	5000	0.8	5.0	—	EEUFK1A472L	100	—
		16.0	20.0	2330	0.026	5000	0.8	7.5	7.5	EEUFK1A472S()	100	250
	5600	12.5	35.0	2940	0.016	5000	0.8	5.0	—	EEUFK1A562L	100	—
NRFND	6800	12.5	40.0	3010	0.014	5000	0.8	5.0	—	EEUFK1A682L	100	—
6800	16.0	25.0	2760	0.019	5000	0.8	7.5	7.5	EEUFK1A682()	100	250	
	18.0	20.0	2640	0.025	5000	0.8	7.5	7.5	EEUFK1A682S()	100	250	
8200	18.0	25.0	2850	0.018	5000	0.8	7.5	7.5	EEUFK1A822S()	100	250	

*1: Ripple current (100 kHz / +105 °C)

NRFND Not recommended for new design

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" between the "()". Lead wire pitch *B=5 mm, 7.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 3000 h / ø8, 105 °C 4000 h / ø10, 105 °C 5000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (µF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current ^{*1} (mA rms)	Impe-dance ^{*2} (Ω)	Endu-rance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				
16	390	8.0	11.5	630	0.090	3000	0.6	3.5	5.0	EEUFK1C391()	200	1000	
	680	8.0	15.0	860	0.062	3000	0.6	3.5	5.0	EEUFK1C681L()	200	1000	
		10.0	12.5	900	0.063	4000	0.6	5.0	5.0	EEUFK1C681()	200	500	
	820	8.0	20.0	1220	0.044	3000	0.6	3.5	5.0	EEUFK1C821L()	200	1000	
	1000	10.0	16.0	1240	0.049	4000	0.6	5.0	5.0	EEUFK1C102()	200	500	
	1200	10.0	20.0	1490	0.035	4000	0.6	5.0	5.0	EEUFK1C122()	200	500	
		12.5	15.0	1400	0.048	5000	0.6	5.0	5.0	EEUFK1C122S()	200	500	
	1500	10.0	25.0	1680	0.033	4000	0.6	5.0	5.0	EEUFK1C152L()	200	500	
	2200	10.0	30.0	2140	0.025	4000	0.6	5.0	—	EEUFK1C222L	100	—	
		12.5	20.0	1890	0.029	5000	0.6	5.0	5.0	EEUFK1C222()	200	500	
		16.0	15.0	1800	0.038	5000	0.8	7.5	7.5	EEUFK1C222S()	100	250	
	2700	12.5	25.0	2280	0.022	5000	0.6	5.0	5.0	EEUFK1C272()	200	500	
		18.0	15.0	2060	0.036	5000	0.8	7.5	7.5	EEUFK1C272S()	100	250	
	3300	12.5	30.0	2720	0.018	5000	0.8	5.0	—	EEUFK1C332L	100	—	
	3900	12.5	35.0	2940	0.016	5000	0.8	5.0	—	EEUFK1C392L	100	—	
		16.0	20.0	2330	0.026	5000	0.8	7.5	7.5	EEUFK1C392S()	100	250	
	NRFND	4700	12.5	40.0	3010	0.014	5000	0.8	5.0	—	EEUFK1C472L	100	—
	4700	18.0	20.0	2640	0.025	5000	0.8	7.5	7.5	EEUFK1C472S()	100	250	
5600	16.0	25.0	2760	0.019	5000	0.8	7.5	7.5	EEUFK1C562()	100	250		
6800	18.0	25.0	2850	0.018	5000	0.8	7.5	7.5	EEUFK1C682S()	100	250		
25	270	8.0	11.5	630	0.090	3000	0.6	3.5	5.0	EEUFK1E271()	200	1000	
	390	8.0	15.0	860	0.062	3000	0.6	3.5	5.0	EEUFK1E391L()	200	1000	
	470	10.0	12.5	900	0.063	4000	0.6	5.0	5.0	EEUFK1E471()	200	500	
	560	8.0	20.0	1220	0.044	3000	0.6	3.5	5.0	EEUFK1E561L()	200	1000	
		10.0	16.0	1240	0.049	4000	0.6	5.0	5.0	EEUFK1E561()	200	500	
	820	10.0	20.0	1490	0.035	4000	0.6	5.0	5.0	EEUFK1E821()	200	500	
		12.5	15.0	1400	0.048	5000	0.6	5.0	5.0	EEUFK1E821S()	200	500	
	1000	10.0	25.0	1680	0.033	4000	0.6	5.0	5.0	EEUFK1E102L()	200	500	
	1200	12.5	20.0	1890	0.029	5000	0.6	5.0	5.0	EEUFK1E122()	200	500	
	1500	10.0	30.0	2140	0.025	4000	0.6	5.0	—	EEUFK1E152L	100	—	
		16.0	15.0	1800	0.038	5000	0.8	7.5	7.5	EEUFK1E152S()	100	250	
	1800	12.5	25.0	2280	0.022	5000	0.6	5.0	5.0	EEUFK1E182()	200	500	
		18.0	15.0	2060	0.036	5000	0.8	7.5	7.5	EEUFK1E182S()	100	250	
	2200	12.5	30.0	2720	0.018	5000	0.8	5.0	—	EEUFK1E222L	100	—	
		16.0	20.0	2330	0.026	5000	0.8	7.5	7.5	EEUFK1E222S()	100	250	
	2700	12.5	35.0	2940	0.016	5000	0.8	5.0	—	EEUFK1E272L	100	—	
	NRFND	3300	12.5	40.0	3010	0.014	5000	0.8	5.0	—	EEUFK1E332L	100	—
	3300	16.0	25.0	2760	0.019	5000	0.8	7.5	7.5	EEUFK1E332()	100	250	
18.0		20.0	2640	0.025	5000	0.8	7.5	7.5	EEUFK1E332S()	100	250		
4700		18.0	25.0	2850	0.018	5000	0.8	7.5	7.5	EEUFK1E472S()	100	250	

*1: Ripple current (100 kHz / +105 °C)

NRFND Not recommended for new design

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" between the "()". Lead wire pitch *B=5 mm, 7.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 3000 h / ø8, 105 °C 4000 h / ø10, 105 °C 5000 h / ø12.5 to ø18


Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impe-dance ^{*2} (Ω)	Endu-rance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping
								Straight	Taping *B			
35	180	8.0	11.5	630	0.090	3000	0.6	3.5	5.0	EEUFK1V181()	200	1000
	270	8.0	15.0	860	0.062	3000	0.6	3.5	5.0	EEUFK1V271L()	200	1000
		10.0	12.5	900	0.063	4000	0.6	5.0	5.0	EEUFK1V271()	200	500
	390	8.0	20.0	1220	0.044	3000	0.6	3.5	5.0	EEUFK1V391L()	200	1000
		10.0	16.0	1240	0.049	4000	0.6	5.0	5.0	EEUFK1V391()	200	500
	560	10.0	20.0	1490	0.035	4000	0.6	5.0	5.0	EEUFK1V561()	200	500
		12.5	15.0	1400	0.048	5000	0.6	5.0	5.0	EEUFK1V561S()	200	500
	680	10.0	25.0	1680	0.033	4000	0.6	5.0	5.0	EEUFK1V681L()	200	500
	820	12.5	20.0	1890	0.029	5000	0.6	5.0	5.0	EEUFK1V821()	200	500
	1000	10.0	30.0	2140	0.025	4000	0.6	5.0	—	EEUFK1V102L	100	—
		16.0	15.0	1800	0.038	5000	0.8	7.5	7.5	EEUFK1V102S()	100	250
	1200	12.5	25.0	2280	0.022	5000	0.6	5.0	5.0	EEUFK1V122()	200	500
		18.0	15.0	2060	0.036	5000	0.8	7.5	7.5	EEUFK1V122S()	100	250
	1500	12.5	30.0	2720	0.018	5000	0.8	5.0	—	EEUFK1V152L	100	—
	1800	12.5	35.0	2940	0.016	5000	0.8	5.0	—	EEUFK1V182L	100	—
		16.0	20.0	2330	0.026	5000	0.8	7.5	7.5	EEUFK1V182S()	100	250
	NRFND 2200	12.5	40.0	3010	0.014	5000	0.8	5.0	—	EEUFK1V222L	100	—
2200	16.0	25.0	2760	0.019	5000	0.8	7.5	7.5	EEUFK1V222()	100	250	
	18.0	20.0	2640	0.025	5000	0.8	7.5	7.5	EEUFK1V222S()	100	250	
3300	18.0	25.0	2850	0.018	5000	0.8	7.5	7.5	EEUFK1V332S()	100	250	

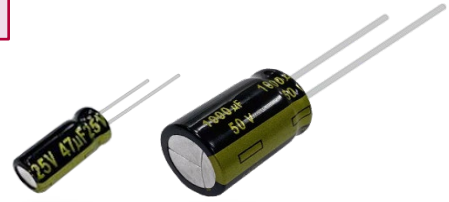
*1: Ripple current (100 kHz / +105 °C)

NRFND Not recommended for new design

*2: Impedance (100 kHz / +20 °C)

- When requesting taped product, please put the letter "B" between the "()". Lead wire pitch *B=5 mm, 7.5 mm.
- Please refer to the page of "Taping dimensions".

 This Series is no longer available for purchase in the country of Japan.



Aluminum Electrolytic Capacitors

Radial Lead Type

FM-A series

Features

- Endurance : 105 °C 2000 h to 7000 h
- Low impedance (40 % to 70 % less than FC series)
- RoHS compliant

Specifications

Category temp. range	-40 °C to +105 °C							
Rated voltage range	6.3 V to 50 V							
Capacitance range	22 μF to 6800 μF							
Capacitance tolerance	±20 % (120 Hz / +20°C)							
Leakage current	I ≤ 0.01 CV (μA) After 2 minutes							
Dissipation factor (tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	(120 Hz / +20°C)
	Dissipation factor (tan δ)	0.22	0.19	0.16	0.14	0.12	0.10	
Endurance	For capacitance value ≥ 1000 μF, add 0.02 per every 1000 μF.							
	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage)when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow.							
	Duration ø5 to ø6.3 : 2000 h, ø8×11.5 to ø8×15: 3000 h ø8×20 to ø10×16 : 4000 h, ø10×20 to ø12.5×20/ ø16×20 : 5000 h ø12.5×25 to ø12.5×35/ ø16×25 : 7000 h							
	Capacitance change	Within ±25 % of the initial value (6.3 V to 10 V : ±30 %)						
Shelf life	Dissipation factor (tan δ)	≤ 200 % of the initial limit						
	DC leakage current	Within the initial limit						
	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)							

Frequency correction factor for ripple current

Cap. (μF) \ Freq. (Hz)	60	120	1 k	10 k	100 k
2.2 to 33	0.45	0.55	0.75	0.90	1.00
47 to 330	0.60	0.70	0.85	0.95	1.00
390 to 1000	0.65	0.75	0.90	0.98	1.00
1200 to 6800	0.75	0.80	0.95	1.00	1.00

Dimensions

* L ≤ 16 : L±1.5
L ≥ 20 : L±2.0

	Unit : mm							
øD	5.0	6.3	8.0	10.0	12.5	16.0		
L	—	—	—	—	12.5 to 25	30 to 40		
ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8	
F	2.0	2.5	3.5	5.0	5.0	5.0	7.5	

Case size / Impedance / Ripple current

R. voltage (V)	6.3 to 35			50		
	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)	Impedance ^{*1} (Ω)		Ripple current ^{*1} (mA rms)
	+20 °C	-10 °C	+105 °C	+20 °C	-10 °C	+105 °C
Case size (mm) (øD×L)						
5 × 11	0.300	1.000	280	0.340	1.130	250
6.3 × 11.2	0.130	0.430	455	0.140	0.460	405
8 × 11.5	0.056	0.168	950	0.061	0.183	870
8 × 15	0.041	0.123	1240	0.045	0.135	1140
8 × 20	0.030	0.090	1560	0.033	0.099	1430
10 × 12.5	0.038	0.114	1290	0.042	0.126	1170
10 × 16	0.026	0.078	1790	0.030	0.090	1650
10 × 20	0.019	0.057	2180	0.023	0.069	1890
10 × 25	0.018	0.054	2470	0.022	0.066	2150
12.5 × 20	0.018	0.045	2600	0.022	0.055	2260
12.5 × 25	0.015	0.038	3190	0.018	0.045	2660
12.5 × 30	0.013	0.033	3630	0.016	0.040	3160
12.5 × 35	0.012	0.030	3750	0.014	0.035	3270
16 × 20	0.017	0.043	3300	0.019	0.048	2870
16 × 25	0.014	0.035	3820	0.016	0.040	3320

*1: 100 kHz

Characteristics list

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impedance ^{*2} (Ω)	Endurance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
6.3	150	5.0	11.0	280	0.300	2000	0.5	2.0	5.0	2.5	EEUFM0J151()	200	2000
	330	6.3	11.2	455	0.130	2000	0.5	2.5	5.0	2.5	EEUFM0J331()	200	2000
	560	8.0	11.5	950	0.056	3000	0.6	3.5	5.0	—	EEUFM0J561()	200	1000
	820	8.0	15.0	1240	0.041	3000	0.6	3.5	5.0	—	EEUFM0J821L()	200	1000
	1000	10.0	12.5	1290	0.038	4000	0.6	5.0	5.0	—	EEUFM0J102()	200	500
	1200	8.0	20.0	1560	0.030	4000	0.6	3.5	5.0	—	EEUFM0J122L()	200	1000
		10.0	16.0	1790	0.026	4000	0.6	5.0	5.0	—	EEUFM0J122()	200	500
	1500	10.0	20.0	2180	0.019	5000	0.6	5.0	5.0	—	EEUFM0J152()	200	500
	2200	10.0	25.0	2470	0.018	5000	0.6	5.0	5.0	—	EEUFM0J222L()	200	500
	3300	12.5	20.0	2600	0.018	5000	0.6	5.0	5.0	—	EEUFM0J332()	200	500
	3900	12.5	25.0	3190	0.015	7000	0.6	5.0	5.0	—	EEUFM0J392()	200	500
	4700	12.5	30.0	3630	0.013	7000	0.8	5.0	—	—	EEUFM0J472L	100	—
	5600	12.5	35.0	3750	0.012	7000	0.8	5.0	—	—	EEUFM0J562L	100	—
		16.0	20.0	3300	0.017	5000	0.8	7.5	7.5	—	EEUFM0J562S()	100	250
	6800	16.0	25.0	3820	0.014	7000	0.8	7.5	7.5	—	EEUFM0J682()	100	250
10	100	5.0	11.0	280	0.300	2000	0.5	2.0	5.0	2.5	EEUFM1A101()	200	2000
	220	6.3	11.2	455	0.130	2000	0.5	2.5	5.0	2.5	EEUFM1A221()	200	2000
	470	8.0	11.5	950	0.056	3000	0.6	3.5	5.0	—	EEUFM1A471()	200	1000
	680	8.0	15.0	1240	0.041	3000	0.6	3.5	5.0	—	EEUFM1A681L()	200	1000
		10.0	12.5	1290	0.038	4000	0.6	5.0	5.0	—	EEUFM1A681()	200	500
	1000	8.0	20.0	1560	0.030	4000	0.6	3.5	5.0	—	EEUFM1A102L()	200	1000
		10.0	16.0	1790	0.026	4000	0.6	5.0	5.0	—	EEUFM1A102()	200	500
	1200	10.0	20.0	2180	0.019	5000	0.6	5.0	5.0	—	EEUFM1A122()	200	500
	1500	10.0	25.0	2470	0.018	5000	0.6	5.0	5.0	—	EEUFM1A152L()	200	500
	2200	12.5	20.0	2600	0.018	5000	0.6	5.0	5.0	—	EEUFM1A222()	200	500
	3300	12.5	25.0	3190	0.015	7000	0.6	5.0	5.0	—	EEUFM1A332()	200	500
	3900	12.5	30.0	3630	0.013	7000	0.8	5.0	—	—	EEUFM1A392L	100	—
		16.0	20.0	3300	0.017	5000	0.8	7.5	7.5	—	EEUFM1A392S()	100	250
	4700	12.5	35.0	3750	0.012	7000	0.8	5.0	—	—	EEUFM1A472L	100	—
	5600	16.0	25.0	3820	0.014	7000	0.8	7.5	7.5	—	EEUFM1A562()	100	250
16	68	5.0	11.0	280	0.300	2000	0.5	2.0	5.0	2.5	EEUFM1C680()	200	2000
	120	6.3	11.2	455	0.130	2000	0.5	2.5	5.0	2.5	EEUFM1C121()	200	2000
	330	8.0	11.5	950	0.056	3000	0.6	3.5	5.0	—	EEUFM1C331()	200	1000
	470	8.0	15.0	1240	0.041	3000	0.6	3.5	5.0	—	EEUFM1C471L()	200	1000
		10.0	12.5	1290	0.038	4000	0.6	5.0	5.0	—	EEUFM1C471()	200	500
	680	8.0	20.0	1560	0.030	4000	0.6	3.5	5.0	—	EEUFM1C681L()	200	1000
		10.0	16.0	1790	0.026	4000	0.6	5.0	5.0	—	EEUFM1C681()	200	500
	1000	10.0	20.0	2180	0.019	5000	0.6	5.0	5.0	—	EEUFM1C102()	200	500
	1200	10.0	25.0	2470	0.018	5000	0.6	5.0	5.0	—	EEUFM1C122L()	200	500
	1500	12.5	20.0	2600	0.018	5000	0.6	5.0	5.0	—	EEUFM1C152()	200	500
	2200	12.5	25.0	3190	0.015	7000	0.6	5.0	5.0	—	EEUFM1C222()	200	500
	2700	12.5	30.0	3630	0.013	7000	0.8	5.0	—	—	EEUFM1C272L	100	—
		16.0	20.0	3300	0.017	5000	0.8	7.5	7.5	—	EEUFM1C272S()	100	250
	3300	12.5	35.0	3750	0.012	7000	0.8	5.0	—	—	EEUFM1C332L	100	—
	3900	16.0	25.0	3820	0.014	7000	0.8	7.5	7.5	—	EEUFM1C392()	100	250

*1: Ripple current (100 kHz / +105 °C)

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Qty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	Impe- dance ^{*2} (Ω)	Endu- rance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
25	47	5.0	11.0	280	0.300	2000	0.5	2.0	5.0	2.5	EEUFM1E470()	200	2000
	100	6.3	11.2	455	0.130	2000	0.5	2.5	5.0	2.5	EEUFM1E101()	200	2000
	220	8.0	11.5	950	0.056	3000	0.6	3.5	5.0	—	EEUFM1E221()	200	1000
	330	8.0	15.0	1240	0.041	3000	0.6	3.5	5.0	—	EEUFM1E331L()	200	1000
		10.0	12.5	1290	0.038	4000	0.6	5.0	5.0	—	EEUFM1E331()	200	500
	470	8.0	20.0	1560	0.030	4000	0.6	3.5	5.0	—	EEUFM1E471L()	200	1000
		10.0	16.0	1790	0.026	4000	0.6	5.0	5.0	—	EEUFM1E471()	200	500
	680	10.0	20.0	2180	0.019	5000	0.6	5.0	5.0	—	EEUFM1E681()	200	500
	820	10.0	25.0	2470	0.018	5000	0.6	5.0	5.0	—	EEUFM1E821L()	200	500
	1000	12.5	20.0	2600	0.018	5000	0.6	5.0	5.0	—	EEUFM1E102()	200	500
	1500	12.5	25.0	3190	0.015	7000	0.6	5.0	5.0	—	EEUFM1E152()	200	500
	1800	12.5	30.0	3630	0.013	7000	0.8	5.0	—	—	EEUFM1E182L	100	—
		16.0	20.0	3300	0.017	5000	0.8	7.5	7.5	—	EEUFM1E182S()	100	250
2200	12.5	35.0	3750	0.012	7000	0.8	5.0	—	—	EEUFM1E222L	100	—	
2700	16.0	25.0	3820	0.014	7000	0.8	7.5	7.5	—	EEUFM1E272()	100	250	
35	33	5.0	11.0	280	0.300	2000	0.5	2.0	5.0	2.5	EEUFM1V330()	200	2000
	68	6.3	11.2	455	0.130	2000	0.5	2.5	5.0	2.5	EEUFM1V680()	200	2000
	150	8.0	11.5	950	0.056	3000	0.6	3.5	5.0	—	EEUFM1V151()	200	1000
	220	8.0	15.0	1240	0.041	3000	0.6	3.5	5.0	—	EEUFM1V221L()	200	1000
		10.0	12.5	1290	0.038	4000	0.6	5.0	5.0	—	EEUFM1V221()	200	500
	330	8.0	20.0	1560	0.030	4000	0.6	3.5	5.0	—	EEUFM1V331L()	200	1000
		10.0	16.0	1790	0.026	4000	0.6	5.0	5.0	—	EEUFM1V331()	200	500
	470	10.0	20.0	2180	0.019	5000	0.6	5.0	5.0	—	EEUFM1V471()	200	500
	560	10.0	25.0	2470	0.018	5000	0.6	5.0	5.0	—	EEUFM1V561L()	200	500
	680	12.5	20.0	2600	0.018	5000	0.6	5.0	5.0	—	EEUFM1V681()	200	500
	1000	12.5	25.0	3190	0.015	7000	0.6	5.0	5.0	—	EEUFM1V102()	200	500
	1200	12.5	30.0	3630	0.013	7000	0.8	5.0	—	—	EEUFM1V122L	100	—
		16.0	20.0	3300	0.017	5000	0.8	7.5	7.5	—	EEUFM1V122S()	100	250
1500	12.5	35.0	3750	0.012	7000	0.8	5.0	—	—	EEUFM1V152L	100	—	
1800	16.0	25.0	3820	0.014	7000	0.8	7.5	7.5	—	EEUFM1V182()	100	250	
50	22	5.0	11.0	250	0.340	2000	0.5	2.0	5.0	2.5	EEUFM1H220()	200	2000
	56	6.3	11.2	405	0.140	2000	0.5	2.5	5.0	2.5	EEUFM1H560()	200	2000
	100	8.0	11.5	870	0.061	3000	0.6	3.5	5.0	—	EEUFM1H101()	200	1000
	120	8.0	15.0	1140	0.045	3000	0.6	3.5	5.0	—	EEUFM1H121L()	200	1000
	150	10.0	12.5	1170	0.042	4000	0.6	5.0	5.0	—	EEUFM1H151()	200	500
	180	8.0	20.0	1430	0.033	4000	0.6	3.5	5.0	—	EEUFM1H181L()	200	1000
	220	10.0	16.0	1650	0.030	4000	0.6	5.0	5.0	—	EEUFM1H221()	200	500
	270	10.0	20.0	1890	0.023	5000	0.6	5.0	5.0	—	EEUFM1H271()	200	500
	330	10.0	25.0	2150	0.022	5000	0.6	5.0	5.0	—	EEUFM1H331L()	200	500
	470	12.5	20.0	2260	0.022	5000	0.6	5.0	5.0	—	EEUFM1H471()	200	500
	560	12.5	25.0	2660	0.018	7000	0.6	5.0	5.0	—	EEUFM1H561()	200	500
	680	12.5	30.0	3160	0.016	7000	0.8	5.0	—	—	EEUFM1H681L	100	—
	820	12.5	35.0	3270	0.014	7000	0.8	5.0	—	—	EEUFM1H821L	100	—
16.0		20.0	2870	0.019	5000	0.8	7.5	7.5	—	EEUFM1H821S()	100	250	
1000	16.0	25.0	3320	0.016	7000	0.8	7.5	7.5	—	EEUFM1H102()	100	250	


*1: Ripple current (100 kHz / +105 °C)

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

 Some part numbers are not recommended for new design.



■ Not available in Japan

Aluminum Electrolytic Capacitors

Radial Lead Type

EB-A series

Features

- Endurance : 105 °C 5000 h to 10000 h
- High ripple high frequency (High voltage)
- RoHS compliant

Specifications

Category temp. range	-40 °C to +105 °C	-25 °C to +105 °C
Rated voltage range	10 V to 63 V	160 V to 450 V
Capacitance range	2.2 μF to 3300 μF	10 μF to 330 μF
Capacitance tolerance	±20 % (120 Hz / +20°C)	
Leakage current	I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)	I ≤ 0.06 CV + 10 (μA) After 2 minutes
Dissipation factor (tan δ)	Please see the attached characteristics list	
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage), when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow. (10 V to 63 V) Duration : ø5×11 to ø8×11.5 : 5000 h, ø8×15 to ø12.5×25 : 10000 h	
	Capacitance change	Within ±30 % of the initial value
	Dissipation factor (tan δ)	≤ 300 % of the initial limit
	DC leakage current	Within the initial limit
	(160 V to 450 V) Duration : 5000 h	
	Capacitance change	Within ±20 % of the initial value
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)	
	Dissipation factor (tan δ)	≤ 200 % of the initial limit
	DC leakage current	Within the initial limit

Frequency correction factor for ripple current

■ 10 V to 63 V

Cap.(μF) \ Freq.(Hz)	60	120	1 k	10 k	100 k
2.2 to 10	0.75	1.00	1.40	1.55	1.65
22 to 470	0.85	1.00	1.20	1.25	1.30
1000 to 3300	0.95	1.00	1.05	1.10	1.15

■ 160 V to 450 V

R. volt.(V) \ Freq.(Hz)	120	1 k	10k to 30k	30k to 100k
160 to 250	0.55	0.85	0.90	1.00
350 to 450	0.50	0.80	0.90	1.00

Dimensions

* L ≤ 16 : L±1.0 (ø8x15 only L±1.5)
L ≥ 20 : L±2.0

	Unit : mm						
øD	5.0	6.3	8.0	10.0	12.5	16.0	18.0
ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5

Characteristics list

Endurance : 105 °C 5000 h / $\varnothing 5 \times 11$ to $\varnothing 8 \times 11.5$, 105 °C 10000 h / $\varnothing 8 \times 15$ to $\varnothing 12.5 \times 25$

Rated voltage (V)	Capacitance ($\pm 20\%$) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		$\varnothing D$	L	Ripple current* ¹ (mA rms)	$\tan \delta$ * ²	Endurance (h)	Lead dia. ($\varnothing d$)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
10	100	5.0	11.0	66	0.30	5000	0.5	2.0	5.0	2.5	EEUEB1A101S()	200	2000
	220	6.3	11.2	100	0.30	5000	0.5	2.5	5.0	2.5	EEUEB1A221S()	200	2000
	470	8.0	15.0	278	0.30	10000	0.6	3.5	5.0	—	EEUEB1A471()	200	1000
		8.0	11.5	180	0.30	5000	0.6	3.5	5.0	—	EEUEB1A471S()	200	1000
	2200	12.5	20.0	540	0.32	10000	0.6	5.0	5.0	—	EEUEB1A222()	200	500
	3300	12.5	25.0	802	0.34	10000	0.6	5.0	5.0	—	EEUEB1A332()	200	500
16	1000	10.0	20.0	430	0.25	10000	0.6	5.0	5.0	—	EEUEB1C102()	200	500
	2200	12.5	25.0	706	0.27	10000	0.6	5.0	5.0	—	EEUEB1C222()	200	500
25	47	5.0	11.0	55	0.22	5000	0.5	2.0	5.0	2.5	EEUEB1E470S()	200	2000
	100	6.3	11.2	95	0.22	5000	0.5	2.5	5.0	2.5	EEUEB1E101S()	200	2000
	220	8.0	11.5	125	0.22	5000	0.6	3.5	5.0	—	EEUEB1E221S()	200	1000
	330	8.0	15.0	255	0.22	10000	0.6	3.5	5.0	—	EEUEB1E331()	200	1000
	470	10.0	16.0	321	0.22	10000	0.6	5.0	5.0	—	EEUEB1E471()	200	500
	1000	12.5	20.0	498	0.22	10000	0.6	5.0	5.0	—	EEUEB1E102()	200	500
35	33	5.0	11.0	46	0.18	5000	0.5	2.0	5.0	2.5	EEUEB1V330S()	200	2000
	220	8.0	15.0	197	0.18	10000	0.6	3.5	5.0	—	EEUEB1V221()	200	1000
	330	10.0	16.0	278	0.18	10000	0.6	5.0	5.0	—	EEUEB1V331()	200	500
	470	10.0	20.0	349	0.18	10000	0.6	5.0	5.0	—	EEUEB1V471()	200	500
	1000	12.5	25.0	586	0.18	10000	0.6	5.0	5.0	—	EEUEB1V102()	200	500
50	2.2	5.0	11.0	15	0.15	5000	0.5	2.0	5.0	2.5	EEUEB1H2R2S()	200	2000
	3.3	5.0	11.0	18	0.15	5000	0.5	2.0	5.0	2.5	EEUEB1H3R3S()	200	2000
	4.7	5.0	11.0	18	0.15	5000	0.5	2.0	5.0	2.5	EEUEB1H4R7S()	200	2000
	10	5.0	11.0	27	0.15	5000	0.5	2.0	5.0	2.5	EEUEB1H100S()	200	2000
	22	5.0	11.0	39	0.15	5000	0.5	2.0	5.0	2.5	EEUEB1H220S()	200	2000
	47	6.3	11.2	61	0.15	5000	0.5	2.5	5.0	2.5	EEUEB1H470S()	200	2000
	100	8.0	11.5	99	0.15	5000	0.6	3.5	5.0	—	EEUEB1H101S()	200	1000
	220	10.0	16.0	234	0.15	10000	0.6	5.0	5.0	—	EEUEB1H221()	200	500
	330	10.0	20.0	293	0.15	10000	0.6	5.0	5.0	—	EEUEB1H331()	200	500
	470	12.5	20.0	370	0.15	10000	0.6	5.0	5.0	—	EEUEB1H471()	200	500
63	2.2	5.0	11.0	16.5	0.12	5000	0.5	2.0	5.0	2.5	EEUEB1J2R2S()	200	2000
	3.3	5.0	11.0	20	0.12	5000	0.5	2.0	5.0	2.5	EEUEB1J3R3S()	200	2000
	4.7	5.0	11.0	23	0.12	5000	0.5	2.0	5.0	2.5	EEUEB1J4R7S()	200	2000
	10	5.0	11.0	30	0.12	5000	0.5	2.0	5.0	2.5	EEUEB1J100S()	200	2000
	22	6.3	11.2	40	0.12	5000	0.5	2.5	5.0	2.5	EEUEB1J220S()	200	2000
	33	6.3	11.2	50	0.12	5000	0.5	2.5	5.0	2.5	EEUEB1J330S()	200	2000
	47	8.0	15.0	94	0.12	10000	0.6	3.5	5.0	—	EEUEB1J470()	200	1000
		8.0	11.5	80	0.12	5000	0.6	3.5	5.0	—	EEUEB1J470S()	200	1000
	100	8.0	15.0	180	0.12	10000	0.6	3.5	5.0	—	EEUEB1J101()	200	1000
	220	10.0	20.0	292	0.12	10000	0.6	5.0	5.0	—	EEUEB1J221()	200	500
	330	12.5	20.0	381	0.12	10000	0.6	5.0	5.0	—	EEUEB1J331()	200	500
	470	12.5	25.0	454	0.12	10000	0.6	5.0	5.0	—	EEUEB1J471()	200	500

*1: Ripple current (120 Hz / +105 °C)

*2: $\tan \delta$ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 5000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current*1 (mA rms)	tan δ ⁻²	Endurance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				
160	22	10.0	20.0	470	0.15	5000	0.6	5.0	5.0	EEUEB2C220()	200	500	
	33	10.0	20.0	470	0.15	5000	0.6	5.0	5.0	EEUEB2C330()	200	500	
	47	12.5	20.0	600	0.15	5000	0.6	5.0	5.0	EEUEB2C470()	200	500	
	68	12.5	25.0	750	0.15	5000	0.6	5.0	5.0	EEUEB2C680()	200	500	
		16.0	20.0	750	0.15	5000	0.8	7.5	7.5	EEUEB2C680S()	100	250	
	100	16.0	25.0	1060	0.15	5000	0.8	7.5	7.5	EEUEB2C101()	100	250	
		18.0	20.0	1060	0.15	5000	0.8	7.5	7.5	EEUEB2C101S()	100	250	
	150	16.0	31.5	1280	0.15	5000	0.8	7.5	—	EEUEB2C151	100	—	
		18.0	25.0	1280	0.15	5000	0.8	7.5	7.5	EEUEB2C151S()	100	250	
	220	16.0	31.5	1280	0.15	5000	0.8	7.5	—	EEUEB2C221	100	—	
18.0		25.0	1280	0.15	5000	0.8	7.5	7.5	EEUEB2C221S()	100	250		
NRFND	330	18.0	31.5	1690	0.15	5000	0.8	7.5	—	EEUEB2C331	50	—	
200	22	10.0	20.0	470	0.15	5000	0.6	5.0	5.0	EEUEB2D220()	200	500	
	33	12.5	20.0	600	0.15	5000	0.6	5.0	5.0	EEUEB2D330()	200	500	
	47	12.5	20.0	600	0.15	5000	0.6	5.0	5.0	EEUEB2D470()	200	500	
	68	12.5	25.0	750	0.15	5000	0.6	5.0	5.0	EEUEB2D680()	200	500	
		16.0	20.0	750	0.15	5000	0.8	7.5	7.5	EEUEB2D680S()	100	250	
	100	16.0	25.0	1060	0.15	5000	0.8	7.5	7.5	EEUEB2D101()	100	250	
		18.0	20.0	1060	0.15	5000	0.8	7.5	7.5	EEUEB2D101S()	100	250	
	150	16.0	31.5	1280	0.15	5000	0.8	7.5	—	EEUEB2D151	100	—	
		18.0	25.0	1280	0.15	5000	0.8	7.5	7.5	EEUEB2D151S()	100	250	
	NRFND	220	18.0	31.5	1690	0.15	5000	0.8	7.5	—	EEUEB2D221	50	—
250	22	12.5	20.0	560	0.15	5000	0.6	5.0	5.0	EEUEB2E220()	200	500	
	33	12.5	20.0	560	0.15	5000	0.6	5.0	5.0	EEUEB2E330()	200	500	
	47	12.5	25.0	710	0.15	5000	0.6	5.0	5.0	EEUEB2E470()	200	500	
		16.0	20.0	710	0.15	5000	0.8	7.5	7.5	EEUEB2E470S()	100	250	
	68	16.0	25.0	990	0.15	5000	0.8	7.5	7.5	EEUEB2E680()	100	250	
		18.0	20.0	990	0.15	5000	0.8	7.5	7.5	EEUEB2E680S()	100	250	
	100	16.0	31.5	1200	0.15	5000	0.8	7.5	—	EEUEB2E101	100	—	
		18.0	25.0	1200	0.15	5000	0.8	7.5	7.5	EEUEB2E101S()	100	250	
	NRFND	150	18.0	31.5	1470	0.15	5000	0.8	7.5	—	EEUEB2E151	50	—
	350	10	10.0	20.0	270	0.20	5000	0.6	5.0	5.0	EEUEB2V100()	200	500
22		12.5	20.0	350	0.20	5000	0.6	5.0	5.0	EEUEB2V220()	200	500	
33		16.0	20.0	480	0.20	5000	0.8	7.5	7.5	EEUEB2V330S()	100	250	
47		16.0	25.0	640	0.20	5000	0.8	7.5	7.5	EEUEB2V470()	100	250	
		18.0	20.0	640	0.20	5000	0.8	7.5	7.5	EEUEB2V470S()	100	250	
68		16.0	31.5	780	0.20	5000	0.8	7.5	—	EEUEB2V680	100	—	
		18.0	25.0	780	0.20	5000	0.8	7.5	7.5	EEUEB2V680S()	100	250	
NRFND		100	18.0	31.5	970	0.20	5000	0.8	7.5	—	EEUEB2V101	50	—
400		10	10.0	20.0	250	0.24	5000	0.6	5.0	5.0	EEUEB2G100()	200	500
		22	12.5	25.0	410	0.24	5000	0.6	5.0	5.0	EEUEB2G220()	200	500
	16.0		20.0	410	0.24	5000	0.8	7.5	7.5	EEUEB2G220S()	100	250	
	33	16.0	25.0	600	0.24	5000	0.8	7.5	7.5	EEUEB2G330()	100	250	
		18.0	20.0	600	0.24	5000	0.8	7.5	7.5	EEUEB2G330S()	100	250	
	47	16.0	31.5	730	0.24	5000	0.8	7.5	—	EEUEB2G470	100	—	
		18.0	25.0	730	0.24	5000	0.8	7.5	7.5	EEUEB2G470S()	100	250	
	450	10	12.5	20.0	310	0.24	5000	0.6	5.0	5.0	EEUEB2W100()	200	500
		22	16.0	25.0	560	0.24	5000	0.8	7.5	7.5	EEUEB2W220()	100	250
			18.0	20.0	560	0.24	5000	0.8	7.5	7.5	EEUEB2W220S()	100	250
33		16.0	31.5	680	0.24	5000	0.8	7.5	—	EEUEB2W330()	100	—	
		18.0	25.0	680	0.24	5000	0.8	7.5	7.5	EEUEB2W330S()	100	250	
NRFND		47	18.0	31.5	850	0.24	5000	0.8	7.5	—	EEUEB2W470	50	—

*1: Ripple current (100 kHz / +105 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" between the "()".

Lead wire pitch *B=5 mm.

• Please refer to the page of "Taping dimensions".

NRFND Not recommended for new design



■ Not available in Japan

Aluminum Electrolytic Capacitors

Radial Lead Type

EE-A series

Features

- Endurance : 105 °C 8000 h to 10000 h
- High ripple current (at high frequency) : 40 % higher than ED series
- RoHS compliant

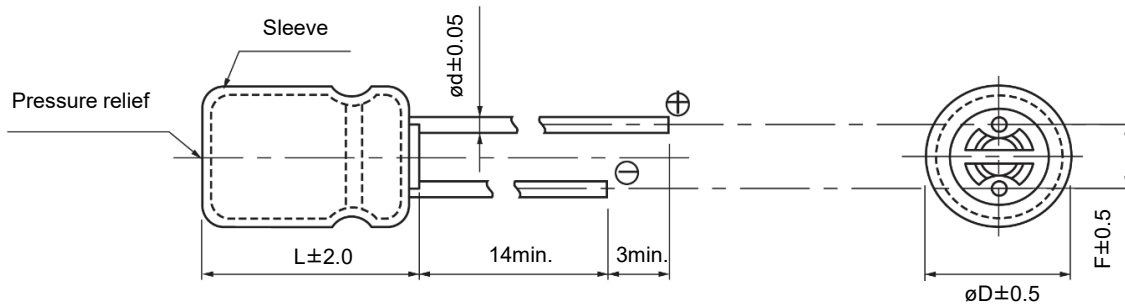
Specifications

Category temp. range	-25 °C to +105 °C							
Rated voltage range	160 V to 450 V							
Capacitance range	10 μF to 330 μF							
Capacitance tolerance	±20 % (120 Hz / +20°C)							
Leakage current	$I \leq 0.06 CV + 10 (\mu A)$ After 2 minutes							
Dissipation factor (tan δ)	Rated voltage (V)	160	200	250	350	400	450	(120 Hz / +20°C)
	Dissipation factor (tan δ)	0.15	0.15	0.15	0.20	0.24	0.24	
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage), when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow. ø10 : 8000 h ø12.5 to ø18 : 10000 h							
	Capacitance change	Within ±20 % of the initial value						
	Dissipation factor (tan δ)	≤ 200 % of the initial limit						
	DC leakage current	Within the initial limit						
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)							

Frequency correction factor for ripple current

Freq.(Hz)	60	120	300	1 k	10 k	100 k
Cap. (μF)						
10 to 82	0.25	0.35	0.50	0.65	0.90	1.00
100 to 330	0.30	0.40	0.55	0.70	0.90	1.00

Dimensions



	Unit : mm			
øD	10.0	12.5	16.0	18.0
ød	0.6	0.6	0.8	0.8
F	5.0	5.0	7.5	7.5

Case size / Ripple current						
Capacitance (μF)	160 V			200 V		
	Case size (mm) ($\varnothing\text{D}\times\text{L}$)	Ripple current (mA rms) (105 °C)		Case size (mm) ($\varnothing\text{D}\times\text{L}$)	Ripple current (mA rms) (105 °C)	
		120 Hz	100 kHz		120 Hz	100 kHz
22	10 x 20	245	700	10 x 20	300	850
33	10 x 20	280	810	10 x 20	320	920
47	10 x 20	370	1065	12.5 x 20	385	1100
68	12.5 x 20	470	1350	12.5 x 25	465	1330
				16 x 20S	465	1330
82	12.5 x 25	520	1480	16 x 20S	510	1460
100	12.5 x 25	660	1660	16 x 25	690	1730
	16 x 20S	680	1700	18 x 20S	670	1665
150	16 x 25	755	1890	16 x 25	740	1860
	18 x 20S	730	1820			
220	16 x 31.5	910	2280	18 x 31.5	1175	2600
	18 x 25S	780	1950			
330	18 x 31.5	1040	2600	18 x 40	1250	3120

Capacitance (μF)	250 V			350 V		
	Case size (mm) ($\varnothing\text{D}\times\text{L}$)	Ripple current (mA rms) (105 °C)		Case size (mm) ($\varnothing\text{D}\times\text{L}$)	Ripple current (mA rms) (105 °C)	
		120 Hz	100 kHz		120 Hz	100 kHz
15	—			10 x 20	170	480
22	10 x 20	275	785	12.5 x 20	230	660
33	12.5 x 20	350	995	12.5 x 25	275	790
				16 x 20S	315	900
47	12.5 x 25	450	1290	16 x 25	375	1070
	16 x 20S	490	1400	18 x 20S	375	1070
68	16 x 20S	490	1400	16 x 31.5	535	1530
				18 x 25S	465	1330
82	16 x 25	590	1680	18 x 25S	535	1530
	18 x 20S	590	1680			
100	16 x 31.5	840	2100	18 x 31.5	640	1600
	18 x 25S	840	2100			
150	18 x 31.5	1010	2520	—	—	—
220	18 x 40	1175	2940	—	—	—

Capacitance (μF)	400 V			450 V		
	Case size (mm) ($\varnothing\text{D}\times\text{L}$)	Ripple current (mA rms) (105 °C)		Case size (mm) ($\varnothing\text{D}\times\text{L}$)	Ripple current (mA rms) (105 °C)	
		120 Hz	100 kHz		120 Hz	100 kHz
10	10 x 20	150	430	10 x 20U	115	330
				12.5 x 20	170	490
15	12.5 x 20	205	590	12.5 x 25	270	780
22	12.5 x 25	265	760	16 x 20S	330	945
	16 x 20S	300	860			
33	16 x 20S	355	1020	16 x 25	350	1000
				18 x 20S	350	1000
47	16 x 25	410	1180	16 x 31.5	420	1200
	18 x 20S	410	1180	18 x 25S	420	1200
56	—	—	—	18 x 31.5	480	1380
68	18 x 25	515	1470	18 x 40	630	1800
82	18 x 31.5	575	1645	—	—	—
100	18 x 40	825	2060	—	—	—

Characteristics list

Endurance : 105 °C 8000 h / ø10, 105 °C 10000 h / ø12.5 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Endurance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping
								Straight	Taping *B			
160	22	10.0	20.0	700	0.15	8000	0.6	5.0	5.0	EEUEE2C220()	200	500
	33	10.0	20.0	810	0.15	8000	0.6	5.0	5.0	EEUEE2C330()	200	500
	47	10.0	20.0	1065	0.15	8000	0.6	5.0	5.0	EEUEE2C470()	200	500
	68	12.5	20.0	1350	0.15	10000	0.6	5.0	5.0	EEUEE2C680()	200	500
	82	12.5	25.0	1480	0.15	10000	0.6	5.0	5.0	EEUEE2C820()	200	500
	100	12.5	25.0	1660	0.15	10000	0.6	5.0	5.0	EEUEE2C101()	200	500
		16.0	20.0	1700	0.15	10000	0.8	7.5	7.5	EEUEE2C101S()	100	250
	150	16.0	25.0	1890	0.15	10000	0.8	7.5	7.5	EEUEE2C151()	100	250
		18.0	20.0	1820	0.15	10000	0.8	7.5	7.5	EEUEE2C151S()	100	250
	220	16.0	31.5	2280	0.15	10000	0.8	7.5	—	EEUEE2C221	100	—
18.0		25.0	1950	0.15	10000	0.8	7.5	7.5	EEUEE2C221S()	100	250	
NRFND	330	18.0	31.5	2600	0.15	10000	0.8	7.5	—	EEUEE2C331	50	—
200	22	10.0	20.0	850	0.15	8000	0.6	5.0	5.0	EEUEE2D220()	200	500
	33	10.0	20.0	920	0.15	8000	0.6	5.0	5.0	EEUEE2D330()	200	500
	47	12.5	20.0	1100	0.15	10000	0.6	5.0	5.0	EEUEE2D470()	200	500
	68	12.5	25.0	1330	0.15	10000	0.6	5.0	5.0	EEUEE2D680()	200	500
		16.0	20.0	1330	0.15	10000	0.8	7.5	7.5	EEUEE2D680S()	100	250
	82	16.0	20.0	1460	0.15	10000	0.8	7.5	7.5	EEUEE2D820S()	100	250
	100	16.0	25.0	1730	0.15	10000	0.8	7.5	7.5	EEUEE2D101()	100	250
		18.0	20.0	1665	0.15	10000	0.8	7.5	7.5	EEUEE2D101S()	100	250
	150	16.0	25.0	1860	0.15	10000	0.8	7.5	7.5	EEUEE2D151()	100	250
	NRFND	220	18.0	31.5	2600	0.15	10000	0.8	7.5	—	EEUEE2D221	50
NRFND	330	18.0	40.0	3120	0.15	10000	0.8	7.5	—	EEUEE2D331	50	—
250	22	10.0	20.0	785	0.15	8000	0.6	5.0	5.0	EEUEE2E220()	200	500
	33	12.5	20.0	995	0.15	10000	0.6	5.0	5.0	EEUEE2E330()	200	500
	47	12.5	25.0	1290	0.15	10000	0.6	5.0	5.0	EEUEE2E470()	200	500
		16.0	20.0	1400	0.15	10000	0.8	7.5	7.5	EEUEE2E470S()	100	250
	68	16.0	20.0	1400	0.15	10000	0.8	7.5	7.5	EEUEE2E680S()	100	250
		16.0	25.0	1680	0.15	10000	0.8	7.5	7.5	EEUEE2E820()	100	250
	82	18.0	20.0	1680	0.15	10000	0.8	7.5	7.5	EEUEE2E820S()	100	250
		16.0	31.5	2100	0.15	10000	0.8	7.5	—	EEUEE2E101	100	—
	18.0	25.0	2100	0.15	10000	0.8	7.5	7.5	EEUEE2E101S()	100	250	
	NRFND	150	18.0	31.5	2520	0.15	10000	0.8	7.5	—	EEUEE2E151	50
NRFND	220	18.0	40.0	2940	0.15	10000	0.8	7.5	—	EEUEE2E221	50	—
350	15	10.0	20.0	480	0.20	8000	0.6	5.0	5.0	EEUEE2V150()	200	500
	22	12.5	20.0	660	0.20	10000	0.6	5.0	5.0	EEUEE2V220()	200	500
	33	12.5	25.0	790	0.20	10000	0.6	5.0	5.0	EEUEE2V330()	200	500
		16.0	20.0	900	0.20	10000	0.8	7.5	7.5	EEUEE2V330S()	100	250
	47	16.0	25.0	1070	0.20	10000	0.8	7.5	7.5	EEUEE2V470()	100	250
		18.0	20.0	1070	0.20	10000	0.8	7.5	7.5	EEUEE2V470S()	100	250
	68	16.0	31.5	1530	0.20	10000	0.8	7.5	—	EEUEE2V680	100	—
		18.0	25.0	1330	0.20	10000	0.8	7.5	7.5	EEUEE2V680S()	100	250
	82	18.0	25.0	1530	0.20	10000	0.8	7.5	7.5	EEUEE2V820S()	100	250
	NRFND	100	18.0	31.5	1600	0.20	10000	0.8	7.5	—	EEUEE2V101	50

*1: Ripple current (100 kHz / +105 °C)

*2: tan δ (120 Hz / +20 °C)

NRFND Not recommended for new design

• When requesting taped product, please put the letter "B" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 8000 h / ϕ 10, 105 °C 10000 h / ϕ 12.5 to ϕ 18

Rated voltage (V)	Capacitance ($\pm 20\%$) (μ F)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)	
		ϕ D	L	Ripple current* ¹ (mA rms)	tan δ * ²	Endurance (h)	Lead dia. (ϕ d)	Lead space			Straight leads	Taping
								Straight	Taping *B			
400	10	10.0	20.0	430	0.24	8000	0.6	5.0	5.0	EEUEE2G100()	200	500
	15	12.5	20.0	590	0.24	10000	0.6	5.0	5.0	EEUEE2G150()	200	500
	22	12.5	25.0	760	0.24	10000	0.6	5.0	5.0	EEUEE2G220()	200	500
		16.0	20.0	860	0.24	10000	0.8	7.5	7.5	EEUEE2G220S()	100	250
	33	16.0	20.0	1020	0.24	10000	0.8	7.5	7.5	EEUEE2G330S()	100	250
	47	16.0	25.0	1180	0.24	10000	0.8	7.5	7.5	EEUEE2G470()	100	250
		18.0	20.0	1180	0.24	10000	0.8	7.5	7.5	EEUEE2G470S()	100	250
	68	18.0	25.0	1470	0.24	10000	0.8	7.5	7.5	EEUEE2G680()	100	250
	NRFND	82	18.0	31.5	1645	0.24	10000	0.8	7.5	—	EEUEE2G820	50
NRFND	100	18.0	40.0	2060	0.24	10000	0.8	7.5	—	EEUEE2G101	50	—
450	10	10.0	20.0	330	0.24	8000	0.6	5.0	5.0	EEUEE2W100U()	200	500
		12.5	20.0	490	0.24	10000	0.6	5.0	5.0	EEUEE2W100()	200	500
	15	12.5	25.0	780	0.24	10000	0.6	5.0	5.0	EEUEE2W150()	200	500
	22	16.0	20.0	945	0.24	10000	0.8	7.5	7.5	EEUEE2W220S()	100	250
	33	16.0	25.0	1000	0.24	10000	0.8	7.5	7.5	EEUEE2W330()	100	250
		18.0	20.0	1000	0.24	10000	0.8	7.5	7.5	EEUEE2W330S()	100	250
	47	16.0	31.5	1200	0.24	10000	0.8	7.5	—	EEUEE2W470	100	—
		18.0	25.0	1200	0.24	10000	0.8	7.5	7.5	EEUEE2W470S()	100	250
	NRFND	56	18.0	31.5	1380	0.24	10000	0.8	7.5	—	EEUEE2W560	50
NRFND	68	18.0	40.0	1800	0.24	10000	0.8	7.5	—	EEUEE2W680	50	—


*1: Ripple current (100 kHz / +105 °C)

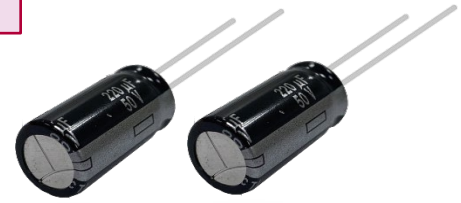
NRFND Not recommended for new design*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm.

• Please refer to the page of "Taping dimensions".

 This Series is no longer available for purchase in the country of Japan.



Aluminum Electrolytic Capacitors

Radial Lead Type

TA-A series

Features

- Endurance : 125 °C 2000 h
- Heat cycle: 1000 cycle -40 °C to +125 °C
- AEC-Q200 compliant
- RoHS compliant

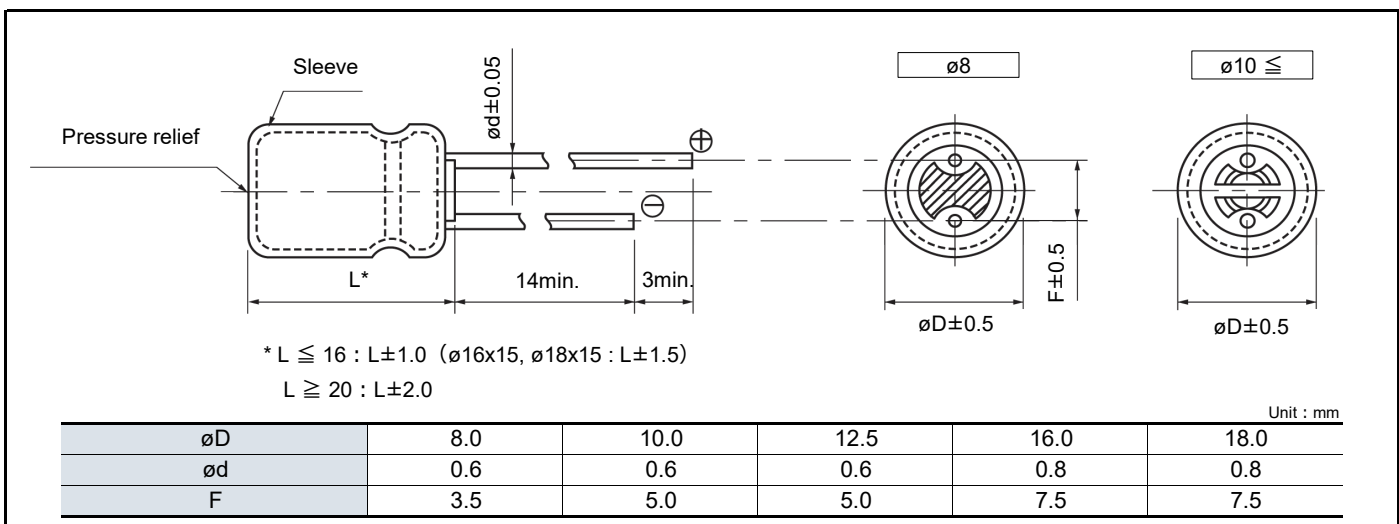
Specifications

Category temp. range	-40 °C to +125 °C							
Rated voltage range	10 V to 63 V							
Capacitance range	2.2 μF to 4700 μF							
Capacitance tolerance	±20 % (120 Hz / +20°C)							
Leakage current	I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)							
Dissipation factor (tan δ)	Rated voltage (V)	10	16	25	35	50	63	(120 Hz / +20°C)
	Dissipation factor (tan δ)	0.20	0.16	0.14	0.12	0.10	0.09	
For capacitance value ≥ 1000 μF , add 0.02 per every 1000 μF.								
Endurance	After following life test with DC voltage and +125 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage) for 2000 h, when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow.							
	Capacitance change	Within ±30 % of the initial value						
	Dissipation factor (tan δ)	≤ 300 % of the initial limit						
	DC leakage current	Within the initial limit						
Shelf life	After storage for 1000 h at +125 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)							

Frequency correction factor for ripple current

Freq. (Hz)	60	120	1 k	10 k	100 k
2.2 to 330	0.55	0.65	0.85	0.90	1.00
470 to 1000	0.70	0.75	0.90	0.95	1.00
2200 to 4700	0.75	0.80	0.90	0.95	1.00

Dimensions



Characteristics list

Endurance : 125 °C 2000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current* ¹ (mA rms)	Impe- dance* ² (Ω)	Lead dia. (ød)	Lead space			Straight leads	Taping
							Straight	Taping *B			
10	330	8.0	11.5	500	0.130	0.6	3.5	5.0	EEUTA1A331()	200	1000
	470	10.0	12.5	680	0.100	0.6	5.0	5.0	EEUTA1A471()	200	500
	1000	10.0	20.0	1100	0.057	0.6	5.0	5.0	EEUTA1A102()	200	500
		12.5	15.0	1085	0.070	0.6	5.0	5.0	EEUTA1A102S()	200	500
	2200	12.5	25.0	1750	0.033	0.6	5.0	5.0	EEUTA1A222L()	200	500
		16.0	20.0	1985	0.032	0.8	7.5	7.5	EEUTA1A222()	100	250
		18.0	15.0	1800	0.042	0.8	7.5	7.5	EEUTA1A222S()	100	250
	3300	16.0	25.0	2300	0.024	0.8	7.5	7.5	EEUTA1A332()	100	250
		18.0	20.0	2250	0.031	0.8	7.5	7.5	EEUTA1A332S()	100	250
	4700	16.0	31.5	2710	0.020	0.8	7.5	—	EEUTA1A472	100	—
18.0		25.0	2470	0.022	0.8	7.5	7.5	EEUTA1A472S()	100	250	
16	220	8.0	11.5	500	0.130	0.6	3.5	5.0	EEUTA1C221()	200	1000
	330	10.0	12.5	680	0.100	0.6	5.0	5.0	EEUTA1C331()	200	500
	470	10.0	16.0	945	0.075	0.6	5.0	5.0	EEUTA1C471()	200	500
	1000	12.5	20.0	1490	0.042	0.6	5.0	5.0	EEUTA1C102()	200	500
		16.0	15.0	1520	0.047	0.8	7.5	7.5	EEUTA1C102S()	100	250
	2200	16.0	25.0	2300	0.024	0.8	7.5	7.5	EEUTA1C222()	100	250
		18.0	20.0	2250	0.031	0.8	7.5	7.5	EEUTA1C222S()	100	250
	3300	16.0	31.5	2710	0.020	0.8	7.5	—	EEUTA1C332	100	—
		18.0	25.0	2470	0.022	0.8	7.5	7.5	EEUTA1C332S()	100	250
	4700	18.0	31.5	3270	0.018	0.8	7.5	—	EEUTA1C472	50	—
25	100	8.0	11.5	500	0.130	0.6	3.5	5.0	EEUTA1E101()	200	1000
	220	10.0	12.5	680	0.100	0.6	5.0	5.0	EEUTA1E221()	200	500
	330	10.0	16.0	945	0.075	0.6	5.0	5.0	EEUTA1E331()	200	500
	470	10.0	20.0	1100	0.057	0.6	5.0	5.0	EEUTA1E471()	200	500
		12.5	15.0	1085	0.070	0.6	5.0	5.0	EEUTA1E471S()	200	500
	1000	12.5	25.0	1750	0.033	0.6	5.0	5.0	EEUTA1E102L()	200	500
		16.0	20.0	1985	0.032	0.8	7.5	7.5	EEUTA1E102()	100	250
		18.0	15.0	1800	0.042	0.8	7.5	7.5	EEUTA1E102S()	100	250
	2200	16.0	31.5	2710	0.020	0.8	7.5	—	EEUTA1E222	100	—
		18.0	25.0	2470	0.022	0.8	7.5	7.5	EEUTA1E222S()	100	250
3300	18.0	35.5	3310	0.017	0.8	7.5	—	EEUTA1E332	50	—	
35	100	10.0	12.5	555	0.180	0.6	5.0	5.0	EEUTA1V101()	200	500
	220	10.0	16.0	765	0.130	0.6	5.0	5.0	EEUTA1V221()	200	500
	330	10.0	20.0	930	0.100	0.6	5.0	5.0	EEUTA1V331()	200	500
	470	12.5	20.0	1330	0.070	0.6	5.0	5.0	EEUTA1V471()	200	500
		16.0	15.0	1450	0.088	0.8	7.5	7.5	EEUTA1V471S()	100	250
	1000	16.0	25.0	2010	0.037	0.8	7.5	7.5	EEUTA1V102()	100	250
		18.0	20.0	2180	0.046	0.8	7.5	7.5	EEUTA1V102S()	100	250
	2200	18.0	35.5	2790	0.025	0.8	7.5	—	EEUTA1V222	50	—

*1: Ripple current (100 kHz / +125 °C)

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 125 °C 2000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current* ¹ (mA rms)	Impe- dance* ² (Ω)	Lead dia. (ød)	Lead space			Straight leads	Taping
							Straight	Taping *B			
50	10	8.0	11.5	180	0.950	0.6	3.5	5.0	EEUTA1H100()	200	1000
	22	8.0	11.5	250	0.650	0.6	3.5	5.0	EEUTA1H220()	200	1000
	33	8.0	11.5	300	0.450	0.6	3.5	5.0	EEUTA1H330()	200	1000
	47	8.0	11.5	440	0.350	0.6	3.5	5.0	EEUTA1H470S()	200	1000
	100	10.0	12.5	555	0.180	0.6	5.0	5.0	EEUTA1H101()	200	500
	220	10.0	20.0	930	0.100	0.6	5.0	5.0	EEUTA1H221()	200	500
	330	12.5	20.0	1330	0.070	0.6	5.0	5.0	EEUTA1H331()	200	500
		16.0	15.0	1450	0.088	0.8	7.5	7.5	EEUTA1H331S()	100	250
	470	12.5	25.0	1650	0.055	0.6	5.0	5.0	EEUTA1H471L()	200	500
		16.0	20.0	1650	0.053	0.8	7.5	7.5	EEUTA1H471()	100	250
18.0		15.0	1710	0.075	0.8	7.5	7.5	EEUTA1H471S()	100	250	
1000	16.0	31.5	2430	0.031	0.8	7.5	—	EEUTA1H102	100	—	
	18.0	25.0	2350	0.032	0.8	7.5	7.5	EEUTA1H102S()	100	250	
63	22	8.0	11.5	310	0.470	0.6	3.5	5.0	EEUTA1J220()	200	1000
	33	10.0	12.5	410	0.360	0.6	5.0	5.0	EEUTA1J330()	200	500
	47	10.0	16.0	460	0.270	0.6	5.0	5.0	EEUTA1J470()	200	500
	100	10.0	20.0	680	0.205	0.6	5.0	5.0	EEUTA1J101()	200	500
	220	12.5	25.0	1325	0.100	0.6	5.0	5.0	EEUTA1J221L()	200	500
		16.0	20.0	1360	0.085	0.8	7.5	7.5	EEUTA1J221()	100	250
		18.0	15.0	1300	0.120	0.8	7.5	7.5	EEUTA1J221S()	100	250
	330	16.0	25.0	1660	0.070	0.8	7.5	7.5	EEUTA1J331()	100	250
		18.0	20.0	1760	0.077	0.8	7.5	7.5	EEUTA1J331S()	100	250
	470	16.0	31.5	2055	0.060	0.8	7.5	—	EEUTA1J471	100	—
18.0		25.0	1990	0.060	0.8	7.5	7.5	EEUTA1J471S()	100	250	

*1: Ripple current (100 kHz / +125 °C)

*2: Impedance (100 kHz / +20 °C)

• When requesting taped product, please put the letter "B" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm.

• Please refer to the page of "Taping dimensions".

! This Series is no longer available for purchase in the country of Japan.



Aluminum Electrolytic Capacitors

Radial Lead Type

TP-A series

Features

- Endurance : 125 °C 2000 h to 5000 h or 135 °C 1000 h to 2000 h
- Smaller than series TA
- High ripple current (at high frequency) : 20 to 40% higher than TA series
- AEC-Q200 compliant
- RoHS compliant

Specifications

Category temp. range	-40 °C to +135 °C		
Rated voltage range	25 V to 35 V		
Capacitance range	100 µF to 5100 µF		
Capacitance tolerance	±20 % (120 Hz / +20°C)		
Leakage current	I ≤ 0.01 CV (µA) After 2 minutes		
Dissipation factor (tan δ)	Rated voltage (V)	25	35
	Dissipation factor (tan δ)	0.14	0.12
(120 Hz / +20°C)			
Endurance 1	For capacitance value ≥ 1000 µF, add 0.02 per every 1000 µF.		
	After following life test with DC voltage and +125 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage)when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow. Duration ø8 : 2000 h, ø10 : 3000 h, ø12.5 : 4000 h, ø16 to ø18 : 5000 h		
	Capacitance change	Within ±30 % of the initial value	
	Dissipation factor (tan δ)	≤ 300 % of the initial limit	
Endurance 2	After following life test with DC voltage and +135 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage)when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow. Duration ø8: 1000 h, ø10 to ø18: 2000 h		
	Capacitance change	Within ±30 % of the initial value	
	Dissipation factor (tan δ)	≤ 300 % of the initial limit	
	DC leakage current	Within the initial limit	
Shelf life 1	After storage for 1000 h at +125 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)		
Shelf life 2	After storage for 1000 h at +135 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)		

Frequency correction factor for ripple current

Cap. (µF) \ Freq. (Hz)	60	120	1 k	10 k	100 k
100 to 330	0.55	0.65	0.85	0.90	1.00
390 to 1000	0.70	0.75	0.90	0.95	1.00
1200 to 5100	0.75	0.80	0.90	0.95	1.00

Dimensions

	ø8	ø10	ø12.5	ø16.0	ø18.0
øD	8.0	10.0	12.5	16.0	18.0
ød	0.6	0.6	0.6	0.8	0.8
F	3.5	5.0	5.0	7.5	7.5

Unit : mm

Characteristics list

Endurance : 125°C 2000 h / ø8, 125°C 3000 h / ø10, 125°C 4000 h / ø12.5, 125°C 5000 h / ø16 to ø18

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification						Lead length (mm)			Part No. ★:Substandard (E24 series numbers)	Min. Packaging Qty (PCS)	
				Ripple current*1 (mA rms)		ESR*2 (Ω)	tan δ*3	Endurance (h)		Lead dia. (ød)	Lead space			Straight leads	Taping
		125°C	135°C	125°C	135°C			Straight	Taping *B						
25	220	10.0	12.5	580	500	0.190	0.14	3000	2000	0.6	5.0	5.0	EEUTP1E221()	200	500
	330	10.0	16.0	1100	945	0.130	0.14	3000	2000	0.6	5.0	5.0	EEUTP1E331()	200	500
	470	8.0	20.0	1060	760	0.067	0.14	2000	1000	0.6	3.5	5.0	EEUTP1E471L()	200	1000
		10.0	16.0	1100	945	0.130	0.14	3000	2000	0.6	5.0	5.0	EEUTP1E471()	200	500
	510	10.0	16.0	1100	945	0.130	0.14	3000	2000	0.6	5.0	5.0	EEUTP1E511(*)	200	500
	820	10.0	20.0	1540	1100	0.052	0.14	3000	2000	0.6	5.0	5.0	EEUTP1E821()	200	500
	1000	12.5	20.0	1860	1490	0.038	0.14	4000	2000	0.6	5.0	5.0	EEUTP1E102()	200	500
	1200	12.5	20.0	1860	1490	0.038	0.14	4000	2000	0.6	5.0	5.0	EEUTP1E122()	200	500
	1800	12.5	25.0	2180	1750	0.030	0.14	4000	2000	0.6	5.0	5.0	EEUTP1E182()	200	500
		16.0	20.0	2380	1985	0.029	0.14	5000	2000	0.8	7.5	7.5	EEUTP1E182S()	100	250
	2000	16.0	20.0	2380	1985	0.029	0.16	5000	2000	0.8	7.5	7.5	EEUTP1E202S(*)	100	250
	2200	16.0	25.0	2760	2300	0.022	0.16	5000	2000	0.8	7.5	7.5	EEUTP1E222()	100	250
		18.0	20.0	2700	2250	0.028	0.16	5000	2000	0.8	7.5	7.5	EEUTP1E222S()	100	250
	2700	16.0	25.0	2760	2300	0.022	0.16	5000	2000	0.8	7.5	7.5	EEUTP1E272()	100	250
		18.0	20.0	2700	2250	0.028	0.16	5000	2000	0.8	7.5	7.5	EEUTP1E272S()	100	250
	3300	16.0	31.5	3250	2710	0.018	0.18	5000	2000	0.8	7.5	—	EEUTP1E332	100	—
		18.0	25.0	2960	2470	0.020	0.18	5000	2000	0.8	7.5	7.5	EEUTP1E332S()	100	250
	3900	16.0	31.5	3250	2710	0.018	0.18	5000	2000	0.8	7.5	—	EEUTP1E392	100	—
		18.0	25.0	2960	2470	0.020	0.18	5000	2000	0.8	7.5	7.5	EEUTP1E392S()	100	250
	4700	18.0	31.5	3480	2900	0.016	0.20	5000	2000	0.8	7.5	—	EEUTP1E472	50	—
5100	18.0	31.5	3480	2900	0.016	0.22	5000	2000	0.8	7.5	—	EEUTP1E512*	50	—	
35	100	10.0	12.5	580	500	0.190	0.12	3000	2000	0.6	5.0	5.0	EEUTP1V101()	200	500
	120	10.0	12.5	580	500	0.190	0.12	3000	2000	0.6	5.0	5.0	EEUTP1V121()	200	500
	220	8.0	20.0	1060	760	0.067	0.12	2000	1000	0.6	3.5	5.0	EEUTP1V221L()	200	1000
		10.0	16.0	1100	945	0.130	0.12	3000	2000	0.6	5.0	5.0	EEUTP1V221()	200	500
	270	8.0	16.0	1060	760	0.067	0.12	2000	1000	0.6	3.5	5.0	EEUTP1V271L()	200	1000
		10.0	16.0	1100	945	0.130	0.12	3000	2000	0.6	5.0	5.0	EEUTP1V271()	200	500
	330	10.0	20.0	1540	1100	0.052	0.12	3000	2000	0.6	5.0	5.0	EEUTP1V331()	200	500
	390	10.0	20.0	1540	1100	0.052	0.12	3000	2000	0.6	5.0	5.0	EEUTP1V391()	200	500
	470	12.5	20.0	1860	1490	0.038	0.12	4000	2000	0.6	5.0	5.0	EEUTP1V471()	200	500
	560	12.5	20.0	1860	1490	0.038	0.12	4000	2000	0.6	5.0	5.0	EEUTP1V561()	200	500
	620	12.5	20.0	1860	1490	0.038	0.12	4000	2000	0.6	5.0	5.0	EEUTP1V621(*)	200	500
	820	12.5	25.0	2180	1750	0.030	0.12	4000	2000	0.6	5.0	5.0	EEUTP1V821()	200	500
	1000	16.0	20.0	2380	1985	0.029	0.12	5000	2000	0.8	7.5	7.5	EEUTP1V102()	100	250
	1200	16.0	20.0	2380	1985	0.029	0.12	5000	2000	0.8	7.5	7.5	EEUTP1V122()	100	250
	1500	16.0	25.0	2760	2300	0.022	0.12	5000	2000	0.8	7.5	7.5	EEUTP1V152()	100	250
		18.0	20.0	2700	2250	0.028	0.12	5000	2000	0.8	7.5	7.5	EEUTP1V152S()	100	250
	1600	16.0	25.0	2760	2300	0.022	0.12	5000	2000	0.8	7.5	7.5	EEUTP1V162(*)	100	250
	1800	16.0	31.5	3250	2710	0.018	0.12	5000	2000	0.8	7.5	—	EEUTP1V182	100	—
		18.0	25.0	2960	2470	0.020	0.12	5000	2000	0.8	7.5	7.5	EEUTP1V182S()	100	250
	2000	16.0	31.5	3250	2710	0.018	0.14	5000	2000	0.8	7.5	—	EEUTP1V202*	100	—
18.0		25.0	2960	2470	0.020	0.14	5000	2000	0.8	7.5	7.5	EEUTP1V202S(*)	100	250	
2200	18.0	31.5	3480	2900	0.016	0.14	5000	2000	0.8	7.5	—	EEUTP1V222	50	—	
2700	18.0	31.5	3480	2900	0.016	0.14	5000	2000	0.8	7.5	—	EEUTP1V272	50	—	

*1: Ripple current (100 kHz / +125 °C or 135 °C)

*2: ESR (100 kHz / +20 °C)

*3: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm.

• Please refer to the page of "Taping dimensions".

⚠ This Series is no longer available for purchase in the country of Japan.



Aluminum Electrolytic Capacitors

Radial Lead Type

HD-A series

Features

- Endurance : 105 °C 1000 h to 2000 h
- Minaturize, Higher Capacitance : 1 Size miniturized product of current A-NHG
- AEC-Q200 compliant
- RoHS compliant

Specifications

Category temp. range	-55 °C to +105 °C	
Rated voltage range	10 V to 50 V	
Capacitance range	2.2 μF to 22000 μF	
Capacitance tolerance	±20 % (120 Hz / +20°C)	
Leakage current	I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)	
Dissipation factor (tan δ)	Please see the attached characteristics list	
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage)when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified bellow. Duration ø5 to ø8 : 1000 h, ø10 to ø18 : 2000 h	
	Capacitance change	Within ±20 % of the initial value
	Dissipation factor (tan δ)	≤ 200 % of the initial limit
	DC leakage current	Within the initial limit
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)	

Frequency correction factor for ripple current

Freq. (Hz)	60	120	1 k	10 k	100 k
Cap. (μF)					
2.2 to 33	0.75	1.00	1.55	1.80	2.00
47 to 470	0.80	1.00	1.35	1.50	1.50
1000 to 22000	0.85	1.00	1.10	1.15	1.15

Dimensions

* L ≤ 16 : L±1.5
L ≥ 20 : L±2.0

	Unit : mm						
øD	5.0	6.3	8.0	10.0	12.5	16.0	18.0
ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5

Characteristics list

Endurance : 105 °C 1000 h / ø5 to ø8, 105 °C 2000 h / ø10 to ø18

Rated voltage (V)	Capacitance (±20 %) (µF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Qty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	tan δ ^{*2}	Endurance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *H			
10	330	6.3	11.2	200	0.24	1000	0.5	2.5	5.0	2.5	EEUHD1A331()	200	2000
	470	8.0	11.5	250	0.24	1000	0.6	3.5	5.0	—	EEUHD1A471()	200	1000
	1000	10.0	12.5	460	0.24	2000	0.6	5.0	5.0	—	EEUHD1A102()	200	500
	2200	10.0	16.0	760	0.26	2000	0.6	5.0	5.0	—	EEUHD1A222()	200	500
	4700	12.5	20.0	1260	0.30	2000	0.6	5.0	5.0	—	EEUHD1A472()	200	500
	6800	12.5	25.0	1570	0.34	2000	0.6	5.0	5.0	—	EEUHD1A682()	200	500
	10000	16.0	25.0	1890	0.42	2000	0.8	7.5	7.5	—	EEUHD1A103()	100	250
	15000	16.0	31.5	2180	0.52	2000	0.8	7.5	—	—	EEUHD1A153	100	—
	22000	18.0	35.5	2400	0.66	2000	0.8	7.5	—	—	EEUHD1A223	50	—
16	100	5.0	11.0	110	0.20	1000	0.5	2.0	5.0	2.5	EEUHD1C101()	200	2000
	220	6.3	11.2	180	0.20	1000	0.5	2.5	5.0	2.5	EEUHD1C221()	200	2000
	330	8.0	11.5	260	0.20	1000	0.6	3.5	5.0	—	EEUHD1C331()	200	1000
	470	8.0	11.5	310	0.20	1000	0.6	3.5	5.0	—	EEUHD1C471()	200	1000
	3300	12.5	20.0	1170	0.24	2000	0.6	5.0	5.0	—	EEUHD1C332()	200	500
	4700	12.5	25.0	1480	0.26	2000	0.6	5.0	5.0	—	EEUHD1C472()	200	500
	6800	16.0	25.0	1780	0.30	2000	0.8	7.5	7.5	—	EEUHD1C682()	100	250
	8200	16.0	25.0	1780	0.34	2000	0.8	7.5	7.5	—	EEUHD1C822()	100	250
	10000	16.0	31.5	2060	0.38	2000	0.8	7.5	—	—	EEUHD1C103	100	—
15000	18.0	35.5	2210	0.48	2000	0.8	7.5	—	—	EEUHD1C153	50	—	
25	47	5.0	11.0	91	0.16	1000	0.5	2.0	5.0	2.5	EEUHD1E470()	200	2000
	68	5.0	11.0	91	0.16	1000	0.5	2.0	5.0	2.5	EEUHD1E680()	200	2000
	100	6.3	11.2	130	0.16	1000	0.5	2.5	5.0	2.5	EEUHD1E101()	200	2000
	220	8.0	11.5	230	0.16	1000	0.6	3.5	5.0	—	EEUHD1E221()	200	1000
	330	8.0	11.5	310	0.16	1000	0.6	3.5	5.0	—	EEUHD1E331()	200	1000
	470	10.0	12.5	380	0.16	2000	0.6	5.0	5.0	—	EEUHD1E471()	200	500
	1000	10.0	16.0	680	0.16	2000	0.6	5.0	5.0	—	EEUHD1E102()	200	500
	2200	12.5	20.0	1090	0.18	2000	0.6	5.0	5.0	—	EEUHD1E222()	200	500
	3300	12.5	25.0	1400	0.20	2000	0.6	5.0	5.0	—	EEUHD1E332()	200	500
	4700	16.0	25.0	1750	0.22	2000	0.8	7.5	7.5	—	EEUHD1E472()	100	250
	5600	16.0	25.0	1750	0.24	2000	0.8	7.5	7.5	—	EEUHD1E562()	100	250
	6800	16.0	31.5	2040	0.26	2000	0.8	7.5	—	—	EEUHD1E682	100	—
10000	18.0	35.5	2200	0.34	2000	0.8	7.5	—	—	EEUHD1E103	50	—	
35	47	5.0	11.0	90	0.14	1000	0.5	2.0	5.0	2.5	EEUHD1V470()	200	2000
	100	6.3	11.2	150	0.14	1000	0.5	2.5	5.0	2.5	EEUHD1V101()	200	2000
	220	8.0	11.5	270	0.14	1000	0.6	3.5	5.0	—	EEUHD1V221()	200	1000
	330	10.0	12.5	350	0.14	2000	0.6	5.0	5.0	—	EEUHD1V331()	200	500
	470	10.0	16.0	460	0.14	2000	0.6	5.0	5.0	—	EEUHD1V471()	200	500
	680	10.0	16.0	460	0.14	2000	0.6	5.0	5.0	—	EEUHD1V681()	200	500
	2200	12.5	25.0	1260	0.16	2000	0.6	5.0	5.0	—	EEUHD1V222()	200	500
	3300	16.0	25.0	1610	0.18	2000	0.8	7.5	7.5	—	EEUHD1V332()	100	250
	4700	16.0	31.5	1910	0.20	2000	0.8	7.5	—	—	EEUHD1V472	100	—
6800	18.0	35.5	2050	0.24	2000	0.8	7.5	—	—	EEUHD1V682	50	—	

*1: Ripple current (120 Hz / +105 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "H" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 1000 h / ø5 to ø8, 105 °C 2000 h / ø10 to ø18

Rated voltage (V)	Capacitance (±20 %) (µF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Qty (PCS)		
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Endurance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				Taping *H
50	2.2	5.0	11.0	18	0.12	1000	0.5	2.0	5.0	2.5	EEUHD1H2R2()	200	2000
	3.3	5.0	11.0	22	0.12	1000	0.5	2.0	5.0	2.5	EEUHD1H3R3()	200	2000
	4.7	5.0	11.0	26	0.12	1000	0.5	2.0	5.0	2.5	EEUHD1H4R7()	200	2000
	10	5.0	11.0	39	0.12	1000	0.5	2.0	5.0	2.5	EEUHD1H100()	200	2000
	22	5.0	11.0	65	0.12	1000	0.5	2.0	5.0	2.5	EEUHD1H220()	200	2000
	33	5.0	11.0	90	0.12	1000	0.5	2.0	5.0	2.5	EEUHD1H330()	200	2000
	47	6.3	11.2	110	0.12	1000	0.5	2.5	5.0	2.5	EEUHD1H470()	200	2000
	68	6.3	11.2	110	0.12	1000	0.5	2.5	5.0	2.5	EEUHD1H680()	200	2000
	100	8.0	11.5	180	0.12	1000	0.6	3.5	5.0	—	EEUHD1H101()	200	1000
	220	10.0	12.5	300	0.12	2000	0.6	5.0	5.0	—	EEUHD1H221()	200	500
	330	10.0	16.0	410	0.12	2000	0.6	5.0	5.0	—	EEUHD1H331()	200	500
	470	10.0	20.0	530	0.12	2000	0.6	5.0	5.0	—	EEUHD1H471()	200	500
	560	16.0	15.0	650	0.12	2000	0.8	7.5	7.5	—	EEUHD1H561S()	100	250
	680	16.0	15.0	650	0.12	2000	0.8	7.5	7.5	—	EEUHD1H681S()	100	250
	1000	12.5	25.0	950	0.12	2000	0.6	5.0	5.0	—	EEUHD1H102()	200	500
2200	16.0	31.5	1470	0.14	2000	0.8	7.5	—	—	EEUHD1H222	100	—	
3300	18.0	35.5	1770	0.16	2000	0.8	7.5	—	—	EEUHD1H332	50	—	

*1: Ripple current (120 Hz / +105 °C)

*2: tan δ (120 Hz / +20 °C)

- When requesting taped product, please put the letter "B" or "H" between the "()".
Lead wire pitch *B=5 mm, 7.5 mm, H=2.5 mm.
- Please refer to the page of "Taping dimensions".



Some part numbers are not recommended for new design.

Aluminum Electrolytic Capacitors

Radial Lead Type

NHG-A series



■ Not available in Japan

Features

- Endurance : 105 °C 1000 h to 2000 h
- AEC-Q200 compliant (6.3 V to 100 V)
- RoHS compliant

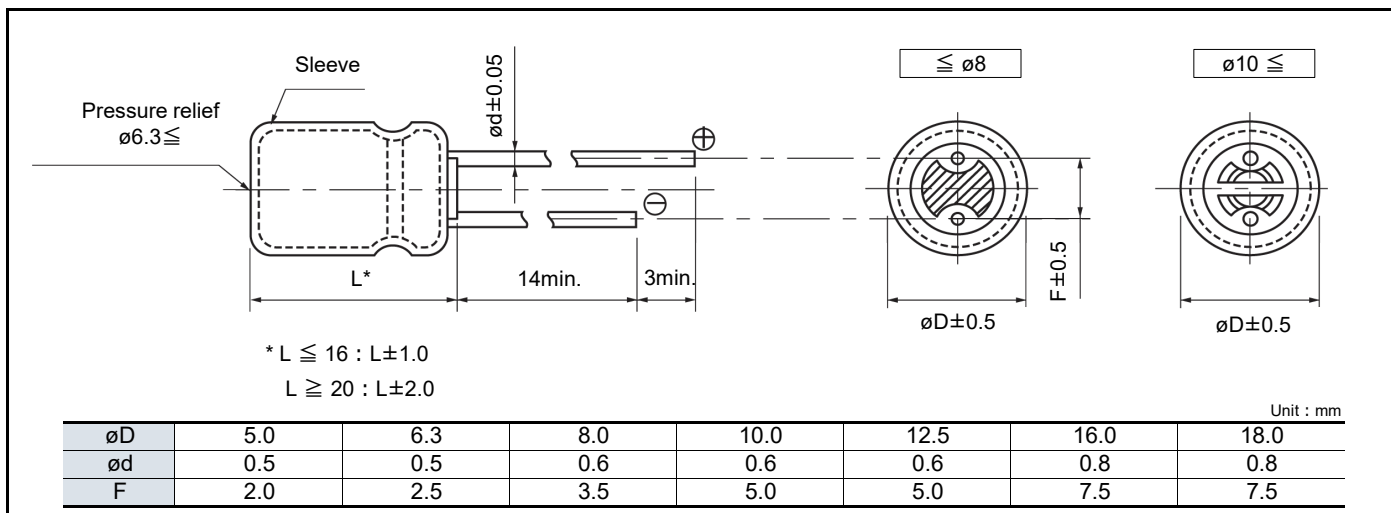
Specifications

Category temp. range	-55 °C to +105 °C	-25 °C to +105 °C
Rated voltage range	6.3 V to 100 V	160 V to 450 V
Capacitance range	2.2 μF to 22000 μF	2.2 μF to 330 μF
Capacitance tolerance	±20 % (120 Hz / +20°C)	
Leakage current	$I \leq 0.01 CV$ or $3 (\mu A)$ After 2 minutes (Which is greater)	$I \leq 0.06 CV + 10 (\mu A)$ After 2 minutes
Dissipation factor (tan δ)	Please see the attached characteristics list	
Endurance	After following life test with DC voltage and +105 °C±2 °C ripple current value applied (The sum of DC and ripple peak voltage shall not exceed the rated working voltage) for 2000 h, when the capacitors are restored to 20 °C, the capacitors shall meet the limits specified below. Duration 6.3 V to 100 V (ø5 to ø8) : 1000 h, (ø10 to ø18) : 2000 h 160 V to 450 V : 2000 h	
	Capacitance change	Within ±20 % of the initial value
	Dissipation factor (tan δ)	≤ 200 % of the initial limit
	DC leakage current	Within the initial limit
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)	

Frequency correction factor for ripple current

Rated voltage (V)	Capacitance (μF)	Frequency (Hz)				
		60	120	1 k	10 k	100 k
6.3 to 100	2.2 to 33	0.75	1.00	1.55	1.80	2.00
	47 to 470	0.80	1.00	1.35	1.50	1.50
	1000 to 22000	0.85	1.00	1.10	1.15	1.15
160 to 450	2.2 to 330	0.80	1.00	1.35	1.50	1.50

Dimensions



Characteristics list

Endurance : 105 °C 1000 h to 2000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	tan δ ^{*2}	Endurance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *i			
6.3	100	5.0	11.0	91	0.28	1000	0.5	2.0	5.0	2.5	ECA0JHG101()	200	2000
	220	5.0	11.0	140	0.28	1000	0.5	2.0	5.0	2.5	ECA0JHG221()	200	2000
	470	6.3	11.2	230	0.28	1000	0.5	2.5	5.0	2.5	ECA0JHG471()	200	2000
	1000	8.0	11.5	380	0.28	1000	0.6	3.5	5.0	—	ECA0JHG102()	200	1000
	2200	10.0	16.0	710	0.30	2000	0.6	5.0	5.0	—	ECA0JHG222()	200	500
	3300	10.0	20.0	840	0.32	2000	0.6	5.0	5.0	—	ECA0JHG332()	200	500
	4700	12.5	20.0	1090	0.34	2000	0.6	5.0	5.0	—	ECA0JHG472()	200	500
	6800	12.5	25.0	1350	0.38	2000	0.6	5.0	5.0	—	ECA0JHG682()	200	500
	10000	16.0	25.0	1650	0.46	2000	0.8	7.5	7.5	—	ECA0JHG103()	100	250
	15000	16.0	31.5	2010	0.56	2000	0.8	7.5	—	—	ECA0JHG153	100	—
22000	18.0	35.5	2350	0.70	2000	0.8	7.5	—	—	ECA0JHG223	50	—	
10	330	6.3	11.2	200	0.24	1000	0.5	2.5	5.0	2.5	ECA1AHG331()	200	2000
	470	8.0	11.5	250	0.24	1000	0.6	3.5	5.0	—	ECA1AHG471()	200	1000
	1000	10.0	12.5	460	0.24	2000	0.6	5.0	5.0	—	ECA1AHG102()	200	500
	2200	10.0	20.0	760	0.26	2000	0.6	5.0	5.0	—	ECA1AHG222()	200	500
	3300	12.5	20.0	1000	0.28	2000	0.6	5.0	5.0	—	ECA1AHG332()	200	500
	4700	12.5	25.0	1260	0.30	2000	0.6	5.0	5.0	—	ECA1AHG472()	200	500
	6800	16.0	25.0	1570	0.34	2000	0.8	7.5	7.5	—	ECA1AHG682()	100	250
	10000	16.0	31.5	1890	0.42	2000	0.8	7.5	—	—	ECA1AHG103	100	—
15000	18.0	35.5	2180	0.52	2000	0.8	7.5	—	—	ECA1AHG153	50	—	
16	100	5.0	11.0	110	0.20	1000	0.5	2.0	5.0	2.5	ECA1CHG101()	200	2000
	220	6.3	11.2	180	0.20	1000	0.5	2.5	5.0	2.5	ECA1CHG221()	200	2000
	330	8.0	11.5	260	0.20	1000	0.6	3.5	5.0	—	ECA1CHG331()	200	1000
	470	8.0	11.5	310	0.20	1000	0.6	3.5	5.0	—	ECA1CHG471()	200	1000
	1000	10.0	16.0	560	0.20	2000	0.6	5.0	5.0	—	ECA1CHG102()	200	500
	2200	12.5	20.0	920	0.22	2000	0.6	5.0	5.0	—	ECA1CHG222()	200	500
	3300	12.5	25.0	1170	0.24	2000	0.6	5.0	5.0	—	ECA1CHG332()	200	500
	4700	16.0	25.0	1480	0.26	2000	0.8	7.5	7.5	—	ECA1CHG472()	100	250
	6800	16.0	31.5	1780	0.30	2000	0.8	7.5	—	—	ECA1CHG682	100	—
	10000	18.0	35.5	2060	0.38	2000	0.8	7.5	—	—	ECA1CHG103	50	—
25	47	5.0	11.0	91	0.16	1000	0.5	2.0	5.0	2.5	ECA1EHG470()	200	2000
	100	6.3	11.2	130	0.16	1000	0.5	2.5	5.0	2.5	ECA1EHG101()	200	2000
	220	8.0	11.5	230	0.16	1000	0.6	3.5	5.0	—	ECA1EHG221()	200	1000
	330	8.0	11.5	310	0.16	1000	0.6	3.5	5.0	—	ECA1EHG331()	200	1000
	470	10.0	12.5	380	0.16	2000	0.6	5.0	5.0	—	ECA1EHG471()	200	500
	1000	10.0	20.0	680	0.16	2000	0.6	5.0	5.0	—	ECA1EHG102()	200	500
	2200	12.5	25.0	1090	0.18	2000	0.6	5.0	5.0	—	ECA1EHG222()	200	500
	3300	16.0	25.0	1400	0.20	2000	0.8	7.5	7.5	—	ECA1EHG332()	100	250
	4700	16.0	31.5	1750	0.22	2000	0.8	7.5	—	—	ECA1EHG472	100	—
	6800	18.0	35.5	2040	0.26	2000	0.8	7.5	—	—	ECA1EHG682	50	—
35	47	5.0	11.0	90	0.14	1000	0.5	2.0	5.0	2.5	ECA1VHG470()	200	2000
	100	6.3	11.2	150	0.14	1000	0.5	2.5	5.0	2.5	ECA1VHG101()	200	2000
	220	8.0	11.5	270	0.14	1000	0.6	3.5	5.0	—	ECA1VHG221()	200	1000
	330	10.0	12.5	350	0.14	2000	0.6	5.0	5.0	—	ECA1VHG331()	200	500
	470	10.0	16.0	460	0.14	2000	0.6	5.0	5.0	—	ECA1VHG471()	200	500
	1000	12.5	20.0	810	0.14	2000	0.6	5.0	5.0	—	ECA1VHG102()	200	500
	2200	16.0	25.0	1260	0.16	2000	0.8	7.5	7.5	—	ECA1VHG222()	100	250
	3300	16.0	31.5	1610	0.18	2000	0.8	7.5	—	—	ECA1VHG332	100	—
4700	18.0	35.5	1910	0.20	2000	0.8	7.5	—	—	ECA1VHG472	50	—	

*1: Ripple current (120 Hz / +105 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, i=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 1000 h to 2000 h

Rated voltage (V)	Capacitance (±20%) (μF)	Case size (mm)		Specification			Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current*1 (mA rms)	tan δ*2	Endurance (h)	Lead dia. (ød)	Lead space			Straight leads	Taping	
								Straight	Taping *B				Taping *i
50	2.2	5.0	11.0	18	0.12	1000	0.5	2.0	5.0	2.5	ECA1HHG2R2()	200	2000
	3.3	5.0	11.0	22	0.12	1000	0.5	2.0	5.0	2.5	ECA1HHG3R3()	200	2000
	4.7	5.0	11.0	26	0.12	1000	0.5	2.0	5.0	2.5	ECA1HHG4R7()	200	2000
	10	5.0	11.0	39	0.12	1000	0.5	2.0	5.0	2.5	ECA1HHG100()	200	2000
	22	5.0	11.0	65	0.12	1000	0.5	2.0	5.0	2.5	ECA1HHG220()	200	2000
	33	5.0	11.0	90	0.12	1000	0.5	2.0	5.0	2.5	ECA1HHG330()	200	2000
	47	6.3	11.2	110	0.12	1000	0.5	2.5	5.0	2.5	ECA1HHG470()	200	2000
	100	8.0	11.5	180	0.12	1000	0.6	3.5	5.0	—	ECA1HHG101()	200	1000
	220	10.0	12.5	300	0.12	2000	0.6	5.0	5.0	—	ECA1HHG221()	200	500
	330	10.0	16.0	410	0.12	2000	0.6	5.0	5.0	—	ECA1HHG331()	200	500
	470	10.0	20.0	530	0.12	2000	0.6	5.0	5.0	—	ECA1HHG471()	200	500
	1000	12.5	25.0	950	0.12	2000	0.6	5.0	5.0	—	ECA1HHG102()	200	500
	2200	16.0	31.5	1470	0.14	2000	0.8	7.5	—	—	ECA1HHG222	100	—
3300	18.0	35.5	1770	0.16	2000	0.8	7.5	—	—	ECA1HHG332	50	—	
63	10	5.0	11.0	46	0.10	1000	0.5	2.0	5.0	2.5	ECA1JHG100()	200	2000
	22	5.0	11.0	71	0.10	1000	0.5	2.0	5.0	2.5	ECA1JHG220()	200	2000
	33	6.3	11.2	100	0.10	1000	0.5	2.5	5.0	2.5	ECA1JHG330()	200	2000
	47	6.3	11.2	120	0.10	1000	0.5	2.5	5.0	2.5	ECA1JHG470()	200	2000
	100	10.0	12.5	215	0.10	2000	0.6	5.0	5.0	—	ECA1JHG101()	200	500
	220	10.0	16.0	335	0.10	2000	0.6	5.0	5.0	—	ECA1JHG221()	200	500
	330	10.0	20.0	510	0.10	2000	0.6	5.0	5.0	—	ECA1JHG331()	200	500
	470	12.5	20.0	640	0.10	2000	0.6	5.0	5.0	—	ECA1JHG471()	200	500
	1000	16.0	25.0	930	0.10	2000	0.8	7.5	7.5	—	ECA1JHG102()	100	250
2200	18.0	35.5	1610	0.12	2000	0.8	7.5	—	—	ECA1JHG222	50	—	
100	2.2	5.0	11.0	21	0.08	1000	0.5	2.0	5.0	2.5	ECA2AHG2R2()	200	2000
	3.3	5.0	11.0	31	0.08	1000	0.5	2.0	5.0	2.5	ECA2AHG3R3()	200	2000
	4.7	5.0	11.0	38	0.08	1000	0.5	2.0	5.0	2.5	ECA2AHG4R7()	200	2000
	10	6.3	11.2	54	0.08	1000	0.5	2.5	5.0	2.5	ECA2AHG100()	200	2000
	22	6.3	11.2	93	0.08	1000	0.5	2.5	5.0	2.5	ECA2AHG220()	200	2000
	33	8.0	11.5	130	0.08	1000	0.6	3.5	5.0	—	ECA2AHG330()	200	1000
	47	10.0	12.5	165	0.08	2000	0.6	5.0	5.0	—	ECA2AHG470()	200	500
	100	10.0	20.0	265	0.08	2000	0.6	5.0	5.0	—	ECA2AHG101()	200	500
	220	12.5	25.0	440	0.08	2000	0.6	5.0	5.0	—	ECA2AHG221()	200	500
	330	16.0	25.0	540	0.08	2000	0.8	7.5	7.5	—	ECA2AHG331()	100	250
	470	16.0	25.0	715	0.08	2000	0.8	7.5	7.5	—	ECA2AHG471()	100	250
	1000	18.0	35.5	985	0.08	2000	0.8	7.5	—	—	ECA2AHG102	50	—

*1: Ripple current (120 Hz / +105 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, i=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 2000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current ^{*1} (mA rms)	tan δ ^{*2}	Endurance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *i			
160	2.2	6.3	11.2	25	0.15	2000	0.5	2.5	5.0	2.5	ECA2CHG2R2()	200	2000
	3.3	6.3	11.2	36	0.15	2000	0.5	2.5	5.0	2.5	ECA2CHG3R3()	200	2000
	4.7	6.3	11.2	43	0.15	2000	0.5	2.5	5.0	2.5	ECA2CHG4R7()	200	2000
	10	10.0	12.5	70	0.15	2000	0.6	5.0	5.0	—	ECA2CHG100()	200	500
	22	10.0	20.0	130	0.15	2000	0.6	5.0	5.0	—	ECA2CHG220()	200	500
	33	10.0	20.0	180	0.15	2000	0.6	5.0	5.0	—	ECA2CHG330()	200	500
	47	12.5	20.0	220	0.15	2000	0.6	5.0	5.0	—	ECA2CHG470()	200	500
	100	16.0	25.0	335	0.15	2000	0.8	7.5	7.5	—	ECA2CHG101()	100	250
	220	16.0	31.5	540	0.15	2000	0.8	7.5	—	—	ECA2CHG221	100	—
NRFND	330	18.0	31.5	705	0.15	2000	0.8	7.5	—	—	ECA2CHG331	50	—
200	2.2	6.3	11.2	25	0.15	2000	0.5	2.5	5.0	2.5	ECA2DHG2R2()	200	2000
	3.3	6.3	11.2	36	0.15	2000	0.5	2.5	5.0	2.5	ECA2DHG3R3()	200	2000
	4.7	8.0	11.5	50	0.15	2000	0.6	3.5	5.0	—	ECA2DHG4R7()	200	1000
	10	10.0	16.0	80	0.15	2000	0.6	5.0	5.0	—	ECA2DHG100()	200	500
	22	10.0	20.0	140	0.15	2000	0.6	5.0	5.0	—	ECA2DHG220()	200	500
	33	12.5	20.0	190	0.15	2000	0.6	5.0	5.0	—	ECA2DHG330()	200	500
	47	12.5	20.0	220	0.15	2000	0.6	5.0	5.0	—	ECA2DHG470()	200	500
	100	16.0	25.0	335	0.15	2000	0.8	7.5	7.5	—	ECA2DHG101()	100	250
	NRFND	220	18.0	31.5	575	0.15	2000	0.8	7.5	—	—	ECA2DHG221	50
250	2.2	6.3	11.2	29	0.15	2000	0.5	2.5	5.0	2.5	ECA2EHG2R2()	200	2000
	3.3	8.0	11.5	42	0.15	2000	0.6	3.5	5.0	—	ECA2EHG3R3	200	1000
	4.7	8.0	11.5	50	0.15	2000	0.6	3.5	5.0	—	ECA2EHG4R7()	200	1000
	10	10.0	16.0	88	0.15	2000	0.6	5.0	5.0	—	ECA2EHG100()	200	500
	22	12.5	20.0	155	0.15	2000	0.6	5.0	5.0	—	ECA2EHG220()	200	500
	33	12.5	20.0	190	0.15	2000	0.6	5.0	5.0	—	ECA2EHG330()	200	500
	47	12.5	25.0	230	0.15	2000	0.6	5.0	5.0	—	ECA2EHG470()	200	500
	100	16.0	31.5	365	0.15	2000	0.8	7.5	—	—	ECA2EHG101	100	—
350	2.2	8.0	11.5	31	0.20	2000	0.6	3.5	5.0	—	ECA2VHG2R2()	200	1000
	3.3	10.0	12.5	38	0.20	2000	0.6	5.0	5.0	—	ECA2VHG3R3()	200	500
	4.7	10.0	16.0	50	0.20	2000	0.6	5.0	5.0	—	ECA2VHG4R7()	200	500
	10	10.0	20.0	82	0.20	2000	0.6	5.0	5.0	—	ECA2VHG100()	200	500
	22	12.5	20.0	130	0.20	2000	0.6	5.0	5.0	—	ECA2VHG220()	200	500
	33	16.0	25.0	195	0.20	2000	0.8	7.5	7.5	—	ECA2VHG330()	100	250
	47	16.0	25.0	230	0.20	2000	0.8	7.5	7.5	—	ECA2VHG470()	100	250
	NRFND	100	18.0	31.5	375	0.20	2000	0.8	7.5	—	—	ECA2VHG101	50

*1: Ripple current (120 Hz / +105 °C)

NRFND Not recommended for new design

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, i=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 105 °C 2000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification			Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Endurance (h)	Lead dia. (ød)	Lead space				Straight leads	Taping
								Straight	Taping *B	Taping *i			
400	2.2	8.0	11.5	30	0.24	2000	0.6	3.5	5.0	—	ECA2GHG2R2()	200	1000
	3.3	10.0	12.5	40	0.24	2000	0.6	5.0	5.0	—	ECA2GHG3R3()	200	500
	4.7	10.0	16.0	50	0.24	2000	0.6	5.0	5.0	—	ECA2GHG4R7()	200	500
	10	10.0	20.0	80	0.24	2000	0.6	5.0	5.0	—	ECA2GHG100()	200	500
	22	12.5	25.0	145	0.24	2000	0.6	5.0	5.0	—	ECA2GHG220()	200	500
	33	16.0	25.0	195	0.24	2000	0.8	7.5	7.5	—	ECA2GHG330()	100	250
	47	16.0	31.5	250	0.24	2000	0.8	7.5	—	—	ECA2GHG470	100	—
450	2.2	10.0	12.5	29	0.24	2000	0.6	5.0	5.0	—	ECA2WHG2R2()	200	500
	3.3	10.0	16.0	41	0.24	2000	0.6	5.0	5.0	—	ECA2WHG3R3()	200	500
	4.7	10.0	20.0	49	0.24	2000	0.6	5.0	5.0	—	ECA2WHG4R7()	200	500
	10	12.5	20.0	75	0.24	2000	0.6	5.0	5.0	—	ECA2WHG100()	200	500
	22	16.0	25.0	115	0.24	2000	0.8	7.5	7.5	—	ECA2WHG220()	100	250
	33	16.0	31.5	155	0.24	2000	0.8	7.5	—	—	ECA2WHG330	100	—

*1: Ripple current (120 Hz / +105 °C)

*2: tan δ (120 Hz / +20 °C)

- When requesting taped product, please put the letter "B" or "i" between the "()".
Lead wire pitch *B=5 mm, 7.5 mm, i=2.5 mm.
- Please refer to the page of "Taping dimensions".

⚠ This Series is no longer available for purchase in the country of Japan.



Aluminum Electrolytic Capacitors

Radial Lead Type

GA-A (Bi-polar) series

Features

- Endurance : 105 °C 1000 h to 2000 h
- RoHS compliant

Specifications

Category temp. range	-40 °C to +105 °C	
Rated voltage range	6.3 V to 50 V	
Capacitance range	2.2 μF to 330 μF	
Capacitance tolerance	±20 % (120 Hz / +20°C)	
Leakage current	I ≤ 0.03 CV + 3 (μA) After 2 minutes or I ≤ 0.03 CV or 3 (μA) After 5 minutes (Whichever is greater)	
Dissipation factor (tan δ)	Please see the attached characteristics list	
Endurance	After following life test of DC working voltage at +105 °C±2 °C when the capacitors are restored to 20 °C, the capacitors shall meet the following limits. Duration ø5 to ø8 : 1000 h (500 h for each polarity) ø10 : 2000 h (1000 h for each polarity)	
	Capacitance change	Within ±20 % of the initial value
	Dissipation factor (tan δ)	≤ 200 % of the initial limit
	DC leakage current	Within the initial limit
Shelf life	After storage for 1000 h at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)	

Frequency correction factor for ripple current

Freq.(Hz)	50, 60	120	1 k	10 k to
Capacitance (μF)				
2.2 to 330	0.70	1.00	1.30	1.70

Dimensions

Sleeve
 Pressure relief ø6.3 ≤
 ød±0.05
 L*
 14min.
 3min.
 ø8
 ø10 ≤
 øD±0.5
 F±0.5
 * L ≤ 16 : L±1.0
 L ≥ 20 : L±2.0
 Unit : mm

øD	5.0	6.3	8.0	10.0
ød	0.5	0.5	0.6	0.6
F	2.0	2.5	3.5	5.0

Characteristics list

Endurance : 105 °C 1000 h / ø5 to ø8 (500 h for each polarity), 105 °C 2000 h / ø10 (1000 h for each polarity)

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Lead dia. (ød)	Lead space			Strai-ght leads	Taping	
							Straight	Taping *B				Taping *i
6.3	100	6.3	11.2	130	0.30	0.5	2.5	5.0	2.5	ECA0JEN101()	200	2000
	330	8.0	11.5	250	0.30	0.6	3.5	5.0	—	ECA0JEN331()	200	1000
10	47	5.0	11.0	90	0.24	0.5	2.0	5.0	2.5	ECA1AEN470()	200	2000
16	10	5.0	11.0	40	0.20	0.5	2.0	5.0	2.5	ECA1CEN100()	200	2000
	22	5.0	11.0	60	0.20	0.5	2.0	5.0	2.5	ECA1CEN220()	200	2000
	33	5.0	11.0	80	0.20	0.5	2.0	5.0	2.5	ECA1CEN330()	200	2000
	47	6.3	11.2	100	0.20	0.5	2.5	5.0	2.5	ECA1CEN470()	200	2000
25	10	5.0	11.0	45	0.15	0.5	2.0	5.0	2.5	ECA1EEN100()	200	2000
	22	6.3	11.2	60	0.15	0.5	2.5	5.0	2.5	ECA1EEN220()	200	2000
	33	6.3	11.2	90	0.15	0.5	2.5	5.0	2.5	ECA1EEN330()	200	2000
	47	6.3	11.2	110	0.15	0.5	2.5	5.0	2.5	ECA1EEN470()	200	2000
	100	8.0	11.5	180	0.15	0.6	3.5	5.0	—	ECA1EEN101()	200	1000
35	33	8.0	11.5	100	0.15	0.6	3.5	5.0	—	ECA1VEN330()	200	1000
	100	10.0	16.0	230	0.15	0.6	5.0	5.0	—	ECA1VEN101()	200	500
50	2.2	5.0	11.0	18	0.15	0.5	2.0	5.0	2.5	ECA1HEN2R2()	200	2000
	3.3	5.0	11.0	25	0.15	0.5	2.0	5.0	2.5	ECA1HEN3R3()	200	2000
	4.7	5.0	11.0	30	0.15	0.5	2.0	5.0	2.5	ECA1HEN4R7()	200	2000
	10	6.3	11.2	50	0.15	0.5	2.5	5.0	2.5	ECA1HEN100()	200	2000
	22	8.0	11.5	90	0.15	0.6	3.5	5.0	—	ECA1HEN220()	200	1000
	33	8.0	11.5	110	0.15	0.6	3.5	5.0	—	ECA1HEN330()	200	1000
	47	10.0	12.5	140	0.15	0.6	5.0	5.0	—	ECA1HEN470()	200	500
	100	10.0	20.0	250	0.15	0.6	5.0	5.0	—	ECA1HEN101()	200	500

*1: Ripple current (120 Hz / +105 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, i=2.5mm.

• Please refer to the page of "Taping dimensions".

⚠ Some part numbers are not recommended for new design.

Aluminum Electrolytic Capacitors

Radial Lead Type

M-A series



■ Not available in Japan

Features

- Endurance : 85 °C 2000 h
- Smaller than series SU
- RoHS compliant

Specifications

Category temp. range	-40 °C to +85 °C	-25 °C to +85 °C
Rated voltage range	6.3 V to 100 V	160 V to 450 V
Capacitance range	2.2 μF to 22000 μF	2.2 μF to 470 μF
Capacitance tolerance	±20 % (120 Hz / +20°C)	
Leakage current	$I \leq 0.01 CV$ or $3 (\mu A)$ After 2 minutes (Which is greater)	$I \leq 0.06 CV + 10 (\mu A)$ After 2 minutes
Dissipation factor (tan δ)	Please see the attached characteristics list	
Endurance	After applying rated working voltage for 2000 hours at +85 °C±2 °C, when the capacitors are restored to 20°C, capacitors shall meet the following limits.	
	Capacitance change	Within ±20 % of the initial value
	Dissipation factor (tan δ)	≤ 150 % of the initial limit
	DC leakage current	Within the initial limit
Shelf life	After storage for 1000 h at +85 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)	

Frequency correction factor for ripple current

Freq. (Hz)	50, 60	120	1 k	10 k to
Cap. (μF)				
2.2 to 22000	0.70	1.00	1.30	1.70

Dimensions

* $L \leq 16 : L \pm 1.0$
 $L \geq 20 : L \pm 2.0$

	Unit : mm						
øD	5.0	6.3	8.0	10.0	12.5	16.0	18.0
ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5

Characteristics list

Endurance : 85 °C 2000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Lead dia. (ød)	Lead space				Strai-ght leads	Taping
							Straight	Taping *B	Taping *i			
6.3	220	5.0	11.0	240	0.28	0.5	2.0	5.0	2.5	ECA0JM221()	200	2000
	470	6.3	11.2	380	0.28	0.5	2.5	5.0	2.5	ECA0JM471()	200	2000
	1000	8.0	11.5	580	0.28	0.6	3.5	5.0	—	ECA0JM102()	200	1000
	2200	10.0	16.0	890	0.30	0.6	5.0	5.0	—	ECA0JM222()	200	500
	3300	10.0	20.0	1020	0.32	0.6	5.0	5.0	—	ECA0JM332()	200	500
	4700	12.5	20.0	1170	0.34	0.6	5.0	5.0	—	ECA0JM472()	200	500
	6800	12.5	25.0	1270	0.38	0.6	5.0	5.0	—	ECA0JM682()	200	500
	10000	16.0	25.0	1450	0.46	0.8	7.5	7.5	—	ECA0JM103()	100	250
	15000	16.0	31.5	1700	0.56	0.8	7.5	—	—	ECA0JM153	100	—
	22000	18.0	35.5	1900	0.70	0.8	7.5	—	—	ECA0JM223	50	—
10	330	6.3	11.2	330	0.24	0.5	2.5	5.0	2.5	ECA1AM331()	200	2000
	1000	10.0	12.5	630	0.24	0.6	5.0	5.0	—	ECA1AM102()	200	500
	2200	10.0	20.0	920	0.26	0.6	5.0	5.0	—	ECA1AM222()	200	500
	3300	12.5	20.0	1090	0.28	0.6	5.0	5.0	—	ECA1AM332()	200	500
	4700	12.5	25.0	1200	0.30	0.6	5.0	5.0	—	ECA1AM472()	200	500
	6800	16.0	25.0	1400	0.34	0.8	7.5	7.5	—	ECA1AM682()	100	250
	10000	16.0	31.5	1600	0.42	0.8	7.5	—	—	ECA1AM103	100	—
	15000	18.0	35.5	1850	0.52	0.8	7.5	—	—	ECA1AM153	50	—
16	10	5.0	11.0	30	0.20	0.5	2.0	5.0	2.5	ECA1CM100()	200	2000
	22	5.0	11.0	75	0.20	0.5	2.0	5.0	2.5	ECA1CM220()	200	2000
	33	5.0	11.0	110	0.20	0.5	2.0	5.0	2.5	ECA1CM330()	200	2000
	47	5.0	11.0	130	0.20	0.5	2.0	5.0	2.5	ECA1CM470()	200	2000
	100	5.0	11.0	180	0.20	0.5	2.0	5.0	2.5	ECA1CM101()	200	2000
	220	6.3	11.2	280	0.20	0.5	2.5	5.0	2.5	ECA1CM221()	200	2000
	470	8.0	11.5	440	0.20	0.6	3.5	5.0	—	ECA1CM471()	200	1000
	1000	10.0	16.0	680	0.20	0.6	5.0	5.0	—	ECA1CM102()	200	500
	2200	12.5	20.0	1000	0.22	0.6	5.0	5.0	—	ECA1CM222()	200	500
	3300	12.5	25.0	1200	0.24	0.6	5.0	5.0	—	ECA1CM332()	200	500
	4700	16.0	25.0	1360	0.26	0.8	7.5	7.5	—	ECA1CM472()	100	250
	6800	16.0	31.5	1600	0.30	0.8	7.5	—	—	ECA1CM682	100	—
10000	18.0	35.5	1800	0.38	0.8	7.5	—	—	ECA1CM103	50	—	
25	100	6.3	11.2	180	0.16	0.5	2.5	5.0	2.5	ECA1EM101()	200	2000
	330	8.0	11.5	390	0.16	0.6	3.5	5.0	—	ECA1EM331()	200	1000
	470	10.0	12.5	480	0.16	0.6	5.0	5.0	—	ECA1EM471()	200	500
	1000	10.0	20.0	850	0.16	0.6	5.0	5.0	—	ECA1EM102()	200	500
	2200	12.5	25.0	1200	0.18	0.6	5.0	5.0	—	ECA1EM222()	200	500
	3300	16.0	25.0	1300	0.20	0.8	7.5	7.5	—	ECA1EM332()	100	250
	4700	16.0	31.5	1500	0.22	0.8	7.5	—	—	ECA1EM472	100	—
	6800	18.0	35.5	1750	0.26	0.8	7.5	—	—	ECA1EM682	50	—

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, i=2.5 mm

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 85 °C 2000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current*1 (mA rms)	tan δ*2	Lead dia. (ød)	Lead space				Strai-ght leads	Taping
							Straight	Taping *B	Taping *i			
35	10	5.0	11.0	60	0.12	0.5	2.0	5.0	2.5	ECA1VM100()	200	2000
	47	5.0	11.0	130	0.14	0.5	2.0	5.0	2.5	ECA1VM470()	200	2000
	100	6.3	11.2	210	0.14	0.5	2.5	5.0	2.5	ECA1VM101()	200	2000
	220	8.0	11.5	350	0.14	0.6	3.5	5.0	—	ECA1VM221()	200	1000
	330	10.0	12.5	440	0.14	0.6	5.0	5.0	—	ECA1VM331()	200	500
	470	10.0	16.0	550	0.14	0.6	5.0	5.0	—	ECA1VM471()	200	500
	1000	12.5	20.0	900	0.14	0.6	5.0	5.0	—	ECA1VM102()	200	500
	2200	16.0	25.0	1250	0.16	0.8	7.5	7.5	—	ECA1VM222()	100	250
	3300	16.0	31.5	1400	0.18	0.8	7.5	—	—	ECA1VM332	100	—
	4700	18.0	35.5	1600	0.20	0.8	7.5	—	—	ECA1VM472	50	—
50	2.2	5.0	11.0	20	0.12	0.5	2.0	5.0	2.5	ECA1HM2R2()	200	2000
	3.3	5.0	11.0	35	0.12	0.5	2.0	5.0	2.5	ECA1HM3R3()	200	2000
	4.7	5.0	11.0	45	0.12	0.5	2.0	5.0	2.5	ECA1HM4R7()	200	2000
	10	5.0	11.0	65	0.12	0.5	2.0	5.0	2.5	ECA1HM100()	200	2000
	22	5.0	11.0	100	0.12	0.5	2.0	5.0	2.5	ECA1HM220()	200	2000
	33	5.0	11.0	110	0.12	0.5	2.0	5.0	2.5	ECA1HM330()	200	2000
	47	6.3	11.2	130	0.12	0.5	2.5	5.0	2.5	ECA1HM470()	200	2000
	100	8.0	11.5	250	0.12	0.6	3.5	5.0	—	ECA1HM101()	200	1000
	220	10.0	12.5	400	0.12	0.6	5.0	5.0	—	ECA1HM221()	200	500
	330	10.0	16.0	500	0.12	0.6	5.0	5.0	—	ECA1HM331()	200	500
	470	10.0	20.0	650	0.12	0.6	5.0	5.0	—	ECA1HM471()	200	500
	1000	12.5	25.0	1050	0.12	0.6	5.0	5.0	—	ECA1HM102()	200	500
	2200	16.0	31.5	1300	0.14	0.8	7.5	—	—	ECA1HM222	100	—
	3300	18.0	35.5	1500	0.16	0.8	7.5	—	—	ECA1HM332	50	—
63	10	5.0	11.0	70	0.11	0.5	2.0	5.0	2.5	ECA1JM100()	200	2000
	22	5.0	11.0	105	0.11	0.5	2.0	5.0	2.5	ECA1JM220()	200	2000
	33	6.3	11.2	130	0.11	0.5	2.5	5.0	2.5	ECA1JM330()	200	2000
	47	6.3	11.2	160	0.11	0.5	2.5	5.0	2.5	ECA1JM470()	200	2000
	100	8.0	11.5	270	0.11	0.6	3.5	5.0	—	ECA1JM101()	200	1000
	220	10.0	16.0	450	0.11	0.6	5.0	5.0	—	ECA1JM221()	200	500
	330	10.0	20.0	550	0.11	0.6	5.0	5.0	—	ECA1JM331()	200	500
	470	12.5	20.0	750	0.11	0.6	5.0	5.0	—	ECA1JM471()	200	500
	1000	16.0	25.0	1100	0.11	0.8	7.5	7.5	—	ECA1JM102()	100	250
	2200	18.0	35.5	1400	0.13	0.8	7.5	—	—	ECA1JM222	50	—

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, i=2.5 mm

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 85 °C 2000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)			
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Lead dia. (ød)	Lead space			Straight leads	Taping		
							Straight	Taping *B				Taping *i	
100	2.2	5.0	11.0	30	0.10	0.5	2.0	5.0	2.5	ECA2AM2R2()	200	2000	
	3.3	5.0	11.0	40	0.10	0.5	2.0	5.0	2.5	ECA2AM3R3()	200	2000	
	4.7	5.0	11.0	50	0.10	0.5	2.0	5.0	2.5	ECA2AM4R7()	200	2000	
	10	5.0	11.0	70	0.10	0.5	2.0	5.0	2.5	ECA2AM100()	200	2000	
	22	6.3	11.2	115	0.10	0.5	2.5	5.0	2.5	ECA2AM220()	200	2000	
	33	8.0	11.5	145	0.10	0.6	3.5	5.0	—	ECA2AM330()	200	1000	
	47	8.0	11.5	180	0.10	0.6	3.5	5.0	—	ECA2AM470()	200	1000	
	100	10.0	16.0	350	0.10	0.6	5.0	5.0	—	ECA2AM101()	200	500	
	220	12.5	20.0	550	0.10	0.6	5.0	5.0	—	ECA2AM221()	200	500	
	330	12.5	25.0	700	0.10	0.6	5.0	5.0	—	ECA2AM331()	200	500	
470	16.0	25.0	900	0.10	0.8	7.5	7.5	—	ECA2AM471()	100	250		
1000	18.0	35.5	1300	0.10	0.8	7.5	—	—	ECA2AM102	50	—		
160	2.2	6.3	11.2	53	0.16	0.5	2.5	5.0	2.5	ECA2CM2R2()	200	2000	
	3.3	6.3	11.2	66	0.16	0.5	2.5	5.0	2.5	ECA2CM3R3()	200	2000	
	4.7	6.3	11.2	78	0.16	0.5	2.5	5.0	2.5	ECA2CM4R7()	200	2000	
	10	10.0	12.5	105	0.16	0.6	5.0	5.0	—	ECA2CM100()	200	500	
	22	10.0	16.0	175	0.16	0.6	5.0	5.0	—	ECA2CM220()	200	500	
	33	10.0	20.0	235	0.16	0.6	5.0	5.0	—	ECA2CM330()	200	500	
	47	12.5	20.0	320	0.16	0.6	5.0	5.0	—	ECA2CM470()	200	500	
	100	12.5	25.0	515	0.16	0.6	5.0	5.0	—	ECA2CM101()	200	500	
	220	16.0	31.5	830	0.16	0.8	7.5	—	—	ECA2CM221	100	—	
NRFND	330	18.0	31.5	1090	0.16	0.8	7.5	—	—	ECA2CM331	50	—	
NRFND	470	18.0	40.0	1440	0.16	0.8	7.5	—	—	ECA2CM471	50	—	
200	2.2	6.3	11.2	50	0.18	0.5	2.5	5.0	2.5	ECA2DM2R2()	200	2000	
	3.3	6.3	11.2	62	0.18	0.5	2.5	5.0	2.5	ECA2DM3R3()	200	2000	
	4.7	8.0	11.5	86	0.18	0.6	3.5	5.0	—	ECA2DM4R7()	200	1000	
	10	10.0	12.5	100	0.18	0.6	5.0	5.0	—	ECA2DM100()	200	500	
	22	10.0	20.0	180	0.18	0.6	5.0	5.0	—	ECA2DM220()	200	500	
	33	10.0	20.0	220	0.18	0.6	5.0	5.0	—	ECA2DM330()	200	500	
	47	12.5	20.0	300	0.18	0.6	5.0	5.0	—	ECA2DM470()	200	500	
	100	16.0	25.0	475	0.18	0.8	7.5	7.5	—	ECA2DM101()	100	250	
	NRFND	220	18.0	31.5	835	0.18	0.8	7.5	—	—	ECA2DM221	50	—
	NRFND	330	18.0	40.0	1140	0.18	0.8	7.5	—	—	ECA2DM331	50	—

*1: Ripple current (120 Hz / +85 °C)

NRFND Not recommended for new design

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, i=2.5 mm

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 85 °C 2000 h

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)				Part No.	Min. Packaging Q'ty (PCS)	
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Lead dia. (ød)	Lead space				Strai-ght leads	Taping
							Straight	Taping *B	Taping *i			
250	2.2	6.3	11.2	50	0.18	0.5	2.5	5.0	2.5	ECA2EM2R2()	200	2000
	3.3	8.0	11.5	72	0.18	0.6	3.5	5.0	—	ECA2EM3R3()	200	1000
	4.7	8.0	11.5	86	0.18	0.6	3.5	5.0	—	ECA2EM4R7()	200	1000
	10	10.0	16.0	110	0.18	0.6	5.0	5.0	—	ECA2EM100()	200	500
	22	10.0	20.0	180	0.18	0.6	5.0	5.0	—	ECA2EM220()	200	500
	33	12.5	20.0	250	0.18	0.6	5.0	5.0	—	ECA2EM330()	200	500
	47	12.5	25.0	330	0.18	0.6	5.0	5.0	—	ECA2EM470()	200	500
	100	16.0	31.5	530	0.18	0.8	7.5	—	—	ECA2EM101	100	—
NRFND	220	18.0	40.0	930	0.18	0.8	7.5	—	—	ECA2EM221	50	—
350	2.2	8.0	11.5	55	0.20	0.6	3.5	5.0	—	ECA2VM2R2()	200	1000
	3.3	8.0	11.5	60	0.20	0.6	3.5	5.0	—	ECA2VM3R3()	200	1000
	4.7	10.0	12.5	65	0.20	0.6	5.0	5.0	—	ECA2VM4R7()	200	500
	10	10.0	20.0	115	0.20	0.6	5.0	5.0	—	ECA2VM100()	200	500
	22	12.5	20.0	195	0.20	0.6	5.0	5.0	—	ECA2VM220()	200	500
	33	16.0	25.0	300	0.20	0.8	7.5	7.5	—	ECA2VM330()	100	250
	47	16.0	25.0	325	0.20	0.8	7.5	7.5	—	ECA2VM470()	100	250
	NRFND	100	18.0	31.5	535	0.20	0.8	7.5	—	—	ECA2VM101	50
400	2.2	8.0	11.5	50	0.20	0.6	3.5	5.0	—	ECA2GM2R2()	200	1000
	3.3	10.0	12.5	54	0.20	0.6	5.0	5.0	—	ECA2GM3R3()	200	500
	4.7	10.0	16.0	72	0.20	0.6	5.0	5.0	—	ECA2GM4R7()	200	500
	10	10.0	20.0	115	0.20	0.6	5.0	5.0	—	ECA2GM100()	200	500
	22	12.5	25.0	215	0.20	0.6	5.0	5.0	—	ECA2GM220()	200	500
	33	16.0	25.0	275	0.20	0.8	7.5	7.5	—	ECA2GM330()	100	250
	47	16.0	31.5	350	0.20	0.8	7.5	—	—	ECA2GM470	100	—
	NRFND	100	18.0	40.0	600	0.20	0.8	7.5	—	—	ECA2GM101	50
450	2.2	10.0	12.5	44	0.20	0.6	5.0	5.0	—	ECA2WM2R2()	200	500
	3.3	10.0	16.0	60	0.20	0.6	5.0	5.0	—	ECA2WM3R3()	200	500
	4.7	10.0	20.0	79	0.20	0.6	5.0	5.0	—	ECA2WM4R7()	200	500
	10	12.5	20.0	130	0.20	0.6	5.0	5.0	—	ECA2WM100()	200	500
	22	16.0	25.0	210	0.20	0.8	7.5	7.5	—	ECA2WM220()	100	250
	33	16.0	31.5	285	0.20	0.8	7.5	—	—	ECA2WM330	100	—

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

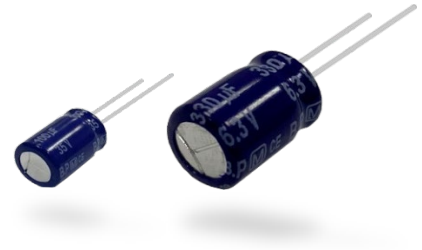
NRFND Not recommended for new design

- When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, i=2.5 mm

- Please refer to the page of "Taping dimensions".

⚠ This Series is no longer available for purchase in the country of Japan.



Aluminum Electrolytic Capacitors

Radial Lead Type

SU-A (Bi-polar) series

Features

- Endurance : 85 °C 2000 h
- RoHS compliant

Specifications

Category temp. range	-40 °C to +85 °C	
Rated voltage range	6.3 V to 50 V	
Capacitance range	2.2 μF to 6800 μF	
Capacitance tolerance	±20 % (120 Hz / +20°C)	
Leakage current	$I \leq 0.03 CV + 3 (\mu A)$ After 5 minutes	
Dissipation factor (tan δ)	Please see the attached characteristics list	
Endurance	After 2000 h application of DC working voltage (1000 h for each polarity) at +85 °C ± 2 °C, when the capacitors are restored to 20 °C, the capacitors shall meet the following limits.	
	Capacitance change	Within ±20 % of the initial value
	Dissipation factor (tan δ)	≤ 150 % of the initial limit
Shelf life	DC leakage current	Within the initial limit
	After storage for 1000 h at +85 °C ± 2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in endurance. (With voltage treatment)	

Frequency correction factor for ripple current

Freq.(Hz)	50, 60	120	1 k	10 k to
Capacitance (μF)				
2.2 to 6800	0.70	1.00	1.30	1.70

Dimensions

* $L \leq 16 : L \pm 1.0$
 $L \geq 20 : L \pm 2.0$

	Unit : mm							
øD	5.0	6.3	8.0	10.0	12.5	16.0	18.0	
ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8	
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	

Characteristics list

Endurance : 85 °C 2000 h (1000 h for each polarity)

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Lead dia. (ød)	Lead space			Strai-ght leads	Taping	
							Straight	Taping *B				Taping *i
6.3	330	8.0	11.5	250	0.30	0.6	3.5	5.0	—	ECEA0JN331U()	200	1000
	470	10.0	12.5	310	0.30	0.6	5.0	5.0	—	ECEA0JN471X()	200	500
	1000	10.0	20.0	430	0.30	0.6	5.0	5.0	—	ECEA0JN102U()	200	500
	2200	12.5	25.0	660	0.32	0.6	5.0	5.0	—	ECEA0JN222U()	200	500
	3300	16.0	25.0	760	0.34	0.8	7.5	7.5	—	ECEA0JN332U()	100	250
	4700	16.0	31.5	1170	0.36	0.8	7.5	—	—	ECEA0JN472U	100	—
	6800	18.0	35.5	1450	0.40	0.8	7.5	—	—	ECEA0JN682U	50	—
10	47	5.0	11.0	90	0.25	0.5	2.0	5.0	2.5	ECEA1AN470U()	200	2000
	100	6.3	11.2	130	0.25	0.5	2.5	5.0	2.5	ECEA1AN101X()	200	2000
	220	8.0	11.5	200	0.25	0.6	3.5	5.0	—	ECEA1AN221U()	200	1000
	330	10.0	16.0	280	0.25	0.6	5.0	5.0	—	ECEA1AN331U()	200	500
	470	10.0	16.0	340	0.25	0.6	5.0	5.0	—	ECEA1AN471U()	200	500
	1000	12.5	20.0	470	0.25	0.6	5.0	5.0	—	ECEA1AN102X()	200	500
	2200	16.0	25.0	690	0.27	0.8	7.5	7.5	—	ECEA1AN222U()	100	250
	3300	16.0	31.5	1090	0.29	0.8	7.5	—	—	ECEA1AN332U	100	—
16	10	5.0	11.0	40	0.20	0.5	2.0	5.0	2.5	ECEA1CN100U()	200	2000
	22	5.0	11.0	60	0.20	0.5	2.0	5.0	2.5	ECEA1CN220U()	200	2000
	33	5.0	11.0	80	0.20	0.5	2.0	5.0	2.5	ECEA1CN330U()	200	2000
	47	6.3	11.2	100	0.20	0.5	2.5	5.0	2.5	ECEA1CN470U()	200	2000
	220	10.0	12.5	260	0.20	0.6	5.0	5.0	—	ECEA1CN221X()	200	500
	330	10.0	16.0	330	0.20	0.6	5.0	5.0	—	ECEA1CN331U()	200	500
	470	10.0	20.0	380	0.20	0.6	5.0	5.0	—	ECEA1CN471U()	200	500
	1000	12.5	25.0	560	0.20	0.6	5.0	5.0	—	ECEA1CN102U()	200	500
	2200	16.0	31.5	750	0.22	0.8	7.5	—	—	ECEA1CN222U	100	—
	3300	18.0	35.5	900	0.24	0.8	7.5	—	—	ECEA1CN332U	50	—
25	10	5.0	11.0	45	0.15	0.5	2.0	5.0	2.5	ECEA1EN100U()	200	2000
	22	5.0	11.0	60	0.15	0.5	2.0	5.0	2.5	ECEA1EN220X()	200	2000
	33	6.3	11.2	90	0.15	0.5	2.5	5.0	2.5	ECEA1EN330U()	200	2000
	47	6.3	11.2	110	0.15	0.5	2.5	5.0	2.5	ECEA1EN470U()	200	2000
	100	8.0	11.5	180	0.15	0.6	3.5	5.0	—	ECEA1EN101U()	200	1000
	220	10.0	16.0	320	0.15	0.6	5.0	5.0	—	ECEA1EN221U()	200	500
	330	12.5	20.0	350	0.15	0.6	5.0	5.0	—	ECEA1EN331U()	200	500
	470	12.5	20.0	430	0.15	0.6	5.0	5.0	—	ECEA1EN471U()	200	500
	1000	16.0	25.0	680	0.15	0.8	7.5	7.5	—	ECEA1EN102U()	100	250
	2200	18.0	35.5	900	0.17	0.8	7.5	—	—	ECEA1EN222U	50	—
35	10	5.0	11.0	43	0.15	0.5	2.0	5.0	2.5	ECEA1VN100U()	200	2000
	22	6.3	11.2	80	0.15	0.5	2.5	5.0	2.5	ECEA1VN220U()	200	2000
	33	8.0	11.5	100	0.15	0.6	3.5	5.0	—	ECEA1VN330U()	200	1000
	47	8.0	11.5	120	0.15	0.6	3.5	5.0	—	ECEA1VN470U()	200	1000
	100	10.0	16.0	230	0.15	0.6	5.0	5.0	—	ECEA1VN101U()	200	500
	220	12.5	20.0	360	0.15	0.6	5.0	5.0	—	ECEA1VN221U()	200	500
	330	12.5	20.0	450	0.15	0.6	5.0	5.0	—	ECEA1VN331U()	200	500
	470	12.5	25.0	590	0.15	0.6	5.0	5.0	—	ECEA1VN471U()	200	500

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, i=2.5 mm.

• Please refer to the page of "Taping dimensions".

Characteristics list

Endurance : 85 °C 2000 h (1000 h for each polarity)

Rated voltage (V)	Capacitance (±20 %) (μF)	Case size (mm)		Specification		Lead length (mm)			Part No.	Min. Packaging Q'ty (PCS)		
		øD	L	Ripple current* ¹ (mA rms)	tan δ* ²	Lead dia. (ød)	Lead space			Strai-ght leads	Taping	
							Straight	Taping *B				Taping *i
50	2.2	5.0	11.0	18	0.15	0.5	2.0	5.0	2.5	ECEA1HN2R2U()	200	2000
	3.3	5.0	11.0	25	0.15	0.5	2.0	5.0	2.5	ECEA1HN3R3U()	200	2000
	4.7	5.0	11.0	30	0.15	0.5	2.0	5.0	2.5	ECEA1HN4R7U()	200	2000
	10	6.3	11.2	50	0.15	0.5	2.5	5.0	2.5	ECEA1HN100U()	200	2000
	22	8.0	11.5	90	0.15	0.6	3.5	5.0	—	ECEA1HN220U()	200	1000
	33	8.0	11.5	110	0.15	0.6	3.5	5.0	—	ECEA1HN330U()	200	1000
	47	10.0	12.5	140	0.15	0.6	5.0	5.0	—	ECEA1HN470U()	200	500
	100	10.0	20.0	250	0.15	0.6	5.0	5.0	—	ECEA1HN101U()	200	500
	220	12.5	25.0	360	0.15	0.6	5.0	5.0	—	ECEA1HN221U()	200	500
	330	16.0	25.0	450	0.15	0.8	7.5	7.5	—	ECEA1HN331U()	100	250
470	16.0	31.5	590	0.15	0.8	7.5	—	—	ECEA1HN471U	100	—	

*1: Ripple current (120 Hz / +85 °C)

*2: tan δ (120 Hz / +20 °C)

• When requesting taped product, please put the letter "B" or "i" between the "()".

Lead wire pitch *B=5 mm, 7.5 mm, i=2.5 mm.

• Please refer to the page of "Taping dimensions".

Safety Precautions

When using our products, no matter what sort of equipment they might be used for, be sure to confirm the applications and environmental conditions with our specifications in advance.

Panasonic
INDUSTRY

Panasonic Industry Co., Ltd.
Device Solutions Business Division

1006 Kadoma, Kadoma City, Osaka
571-8506 Japan