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THINK AHEAD.

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CONSUMER SERIES CAPACITORS

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CONSUMER
SERIES
CAPACITORS
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CAPACITOR SERIES TABLE, CONTENTS
CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

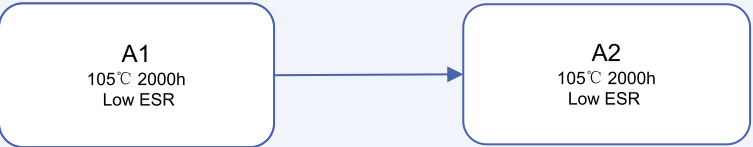
Category & Series			Features	Endurance (hours)	Rated Voltage Range (Vdc)	Operating Temperature Range(°C)	Capacitance Range(uF)	Page
Solid	Multilayer Type	A1	Low ESR	105℃ 2,000	2~25	-55~+105	10~470	24
		A2	Low ESR	105℃ 2,000	2~16	-55~+105	47~470	27
	Radial Type	PZ	Standard	105℃ 2,000	6.3~125	-55~+105	4.7~5,600	29
		PT	Long Life, high temperature	125℃ 2,000	6.3~25	-55~+125	22~5,600	37
		PF	Long life	105℃ 3,000~5,000	6.3~125	-55~+105	4.7~5,600	42
		PU	Low ESR	105℃ 2,000	6.3~25	-55~+105	39~5,600	49
		PR	Low ESR, long life, high ripple current	105℃ 5,000	2.5~35	-55~+105	47~1,500	54
	SMD Type	VZ	Standard	105℃ 2,000	2.5 ~100	-55~+105	22~2,200	57
		VD	High voltage	105℃ 2,000	35 ~63	-55~+105	22~470	61
		VT	High temperature	125℃ 2,000	2.5 ~63	-55~+125	22~2,200	63
		VF	Long life	105℃ 3,000~5,000	2.5 ~63	-55~+105	22~2,200	66

ALUMINUM ELECTROLYTIC CAPACITORS

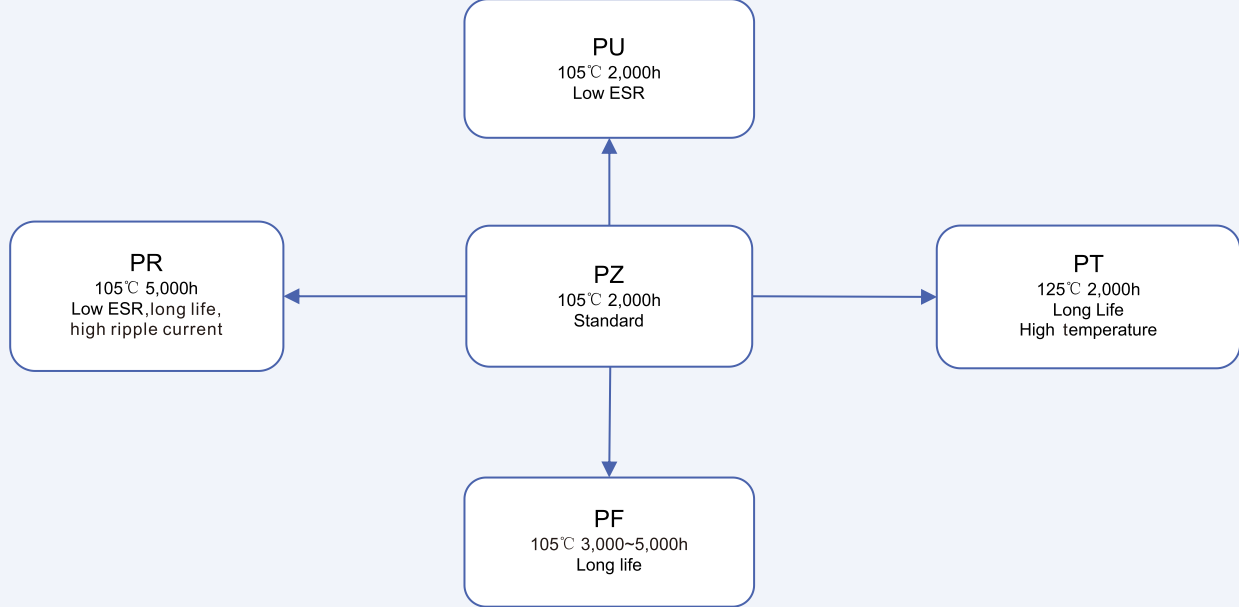
Category & Series			Features	Endurance (hours)	Rated Voltage Range (Vdc)	Operating Temperature Range(°C)	Capacitance Range(uF)	Page
Surface Mount Type	SMD Type	MK	Standard	105℃ 2,000	6.3~100	-55~+105	4.7~1,000	69
		MF	Long life	105℃ 5,000	6.3~100	-55~+105	22~1,000	71
		MH	Resistant to 125℃, long life	125℃ 1,000~3,000	10~100	-55~+125	10~1,000	73
Radial Type	Low Profile	H7	105℃ 7mm Height, miniature series	105℃ 1,000	6.3~50	-40~+105	0.1~100	75
		L7	105℃ 7mm Height, miniature series	105℃ 2,000	6.3~63	-40~+105	0.1~220	77
	Standard	WK	Standard series for general purpose	85℃ 2,000	6.3~100 160~450	-40~+85 -25~+85	0.1~22,000	79
		WH	Standard series for general purpose	105℃ 2,000	6.3~100 160~500	-40~+105 -25~+105	0.1~22,000	83
	For Input and Output Circuit	RR	High frequency, low impedance, high reliability	105℃ 2,000	6.3~120	-40~+105	0.47~6,800	87
		RE	High frequency, low impedance	105℃ 2,000~4,000	6.3~120	-40~+105	10~4,700	92
		RF	Ultra-low impedance, high ripple current	105℃ 3,000~6,000	6.3~120	-40~+105	6.8~6,800	96
		RS	High ripple current, low impedance, long life	105℃ 4,000~10,000	6.3~120	-40~+105	6.8~18,000	101
		RZ	High ripple, high reliability	105℃ 6,000~10,000	6.3~50	-40~+105	22~10,000	108
		RJ	Low impedance, high ripple current, long life	105℃ 8,000~12,000	10~120	-40~+105	8.2~5,600	112
		RH	High frequency, low impedance	105℃ 2,000~3,000	160~450 500~550	-40~+105 -25~+105	1~470	118
		HS	High ripple current	105℃ 3,000~5,000	160~450 500~550	-40~+105 -25~+105	1~420	121
		HF	Long life and high ripple current	105℃ 5,000~10,000	160~450 475~550	-40~+105 -25~+105	1~390	125
		HT	High temperature & ripple current	125℃ 2,000	160~450 500	-40~+125 -25~+125	4.7~150	128
		HL	Long life, downsized and high ripple current	105℃ 8,000~12,000	160~450 500	-40~+105 -25~+105	6.8~680	131
		RK	Miniaturized, high voltage. Specially designed for charger	105℃ 2,000	160~450 500 ~ 600	-40~+105 -25~+105	1~120	134
	High Reliability	ML	105℃ 7~9mm Height, long life	105℃ 5,000	6.3~50	-40~+105	4.7~1,000	137
		RM	Miniaturized, long life	105℃ 10,000	10~100	-40~+105	0.47~330	139
		NB	Resistant to 130℃, high reliability	130℃ 2,000~5,000	10~120	-25~+130	1~4,700	141
	Special Purpose	RD	High frequency, low impedance	105℃ 2,000~5,000	6.3~100	-40~+105	0.47~15,000	144
		GH	For intelligent instrument, electronic ballast, etc.	105℃ 5,000~10,000	6.3~450	-40~+105	1~18,000	151
		LL	Extremely low leakage current	105℃ 2,000	6.3~100	-40~+105	0.47~2200	156
		RG	Good low temperature performance, low impedance and high frequency	105℃ 2,000~8,000	6.3~100	-55~+105	10~10000	158
		HP	Standard bi-polarized series	105℃ 1,000	6.3~100	-40~+105	0.47~6800	163

Group Chart
CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

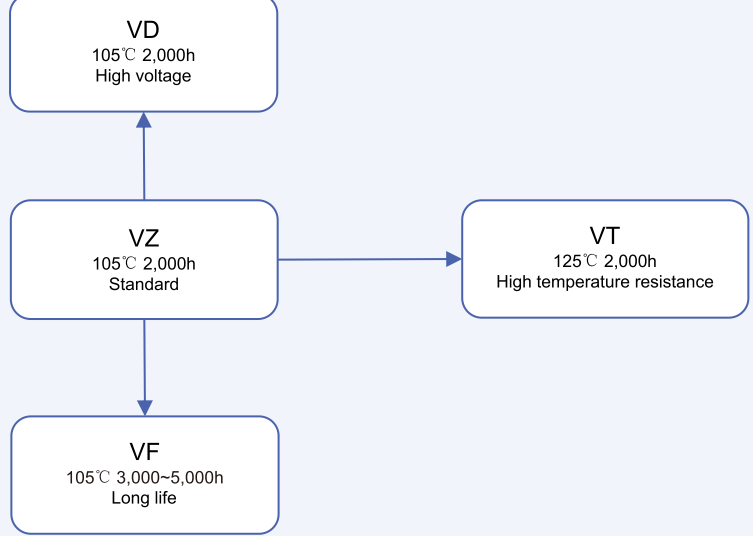
■ MULTILAYER TYPE



■ RADIAL TYPE

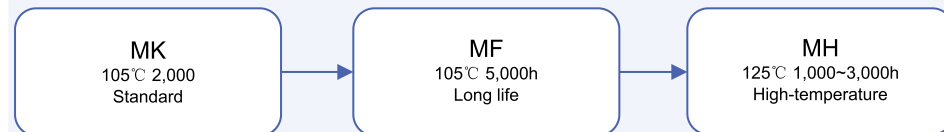


■ SMD TYPE

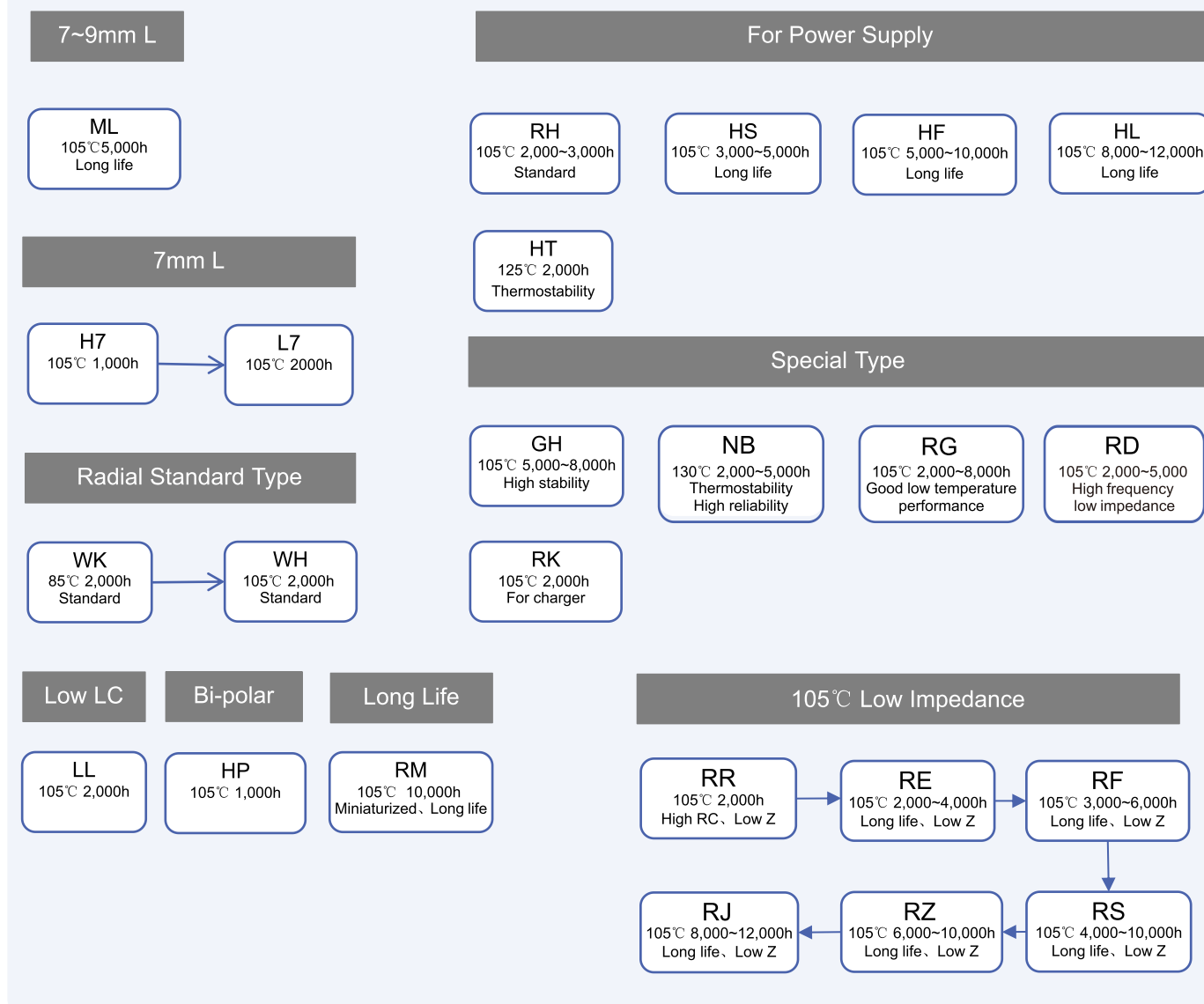


ALUMINUM ELECTROLYTIC CAPACITORS

■ SMD TYPE

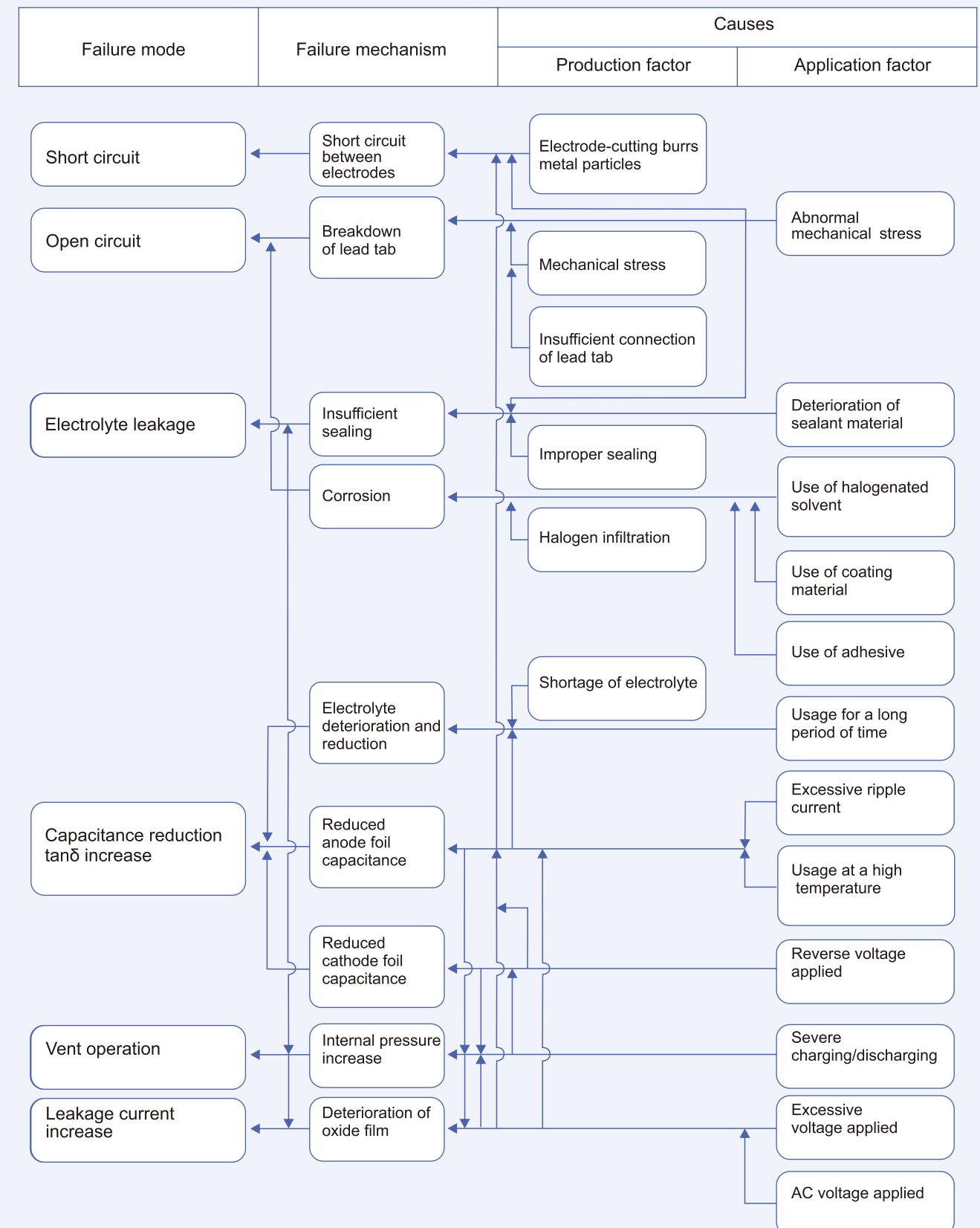


■ RADIAL TYPE



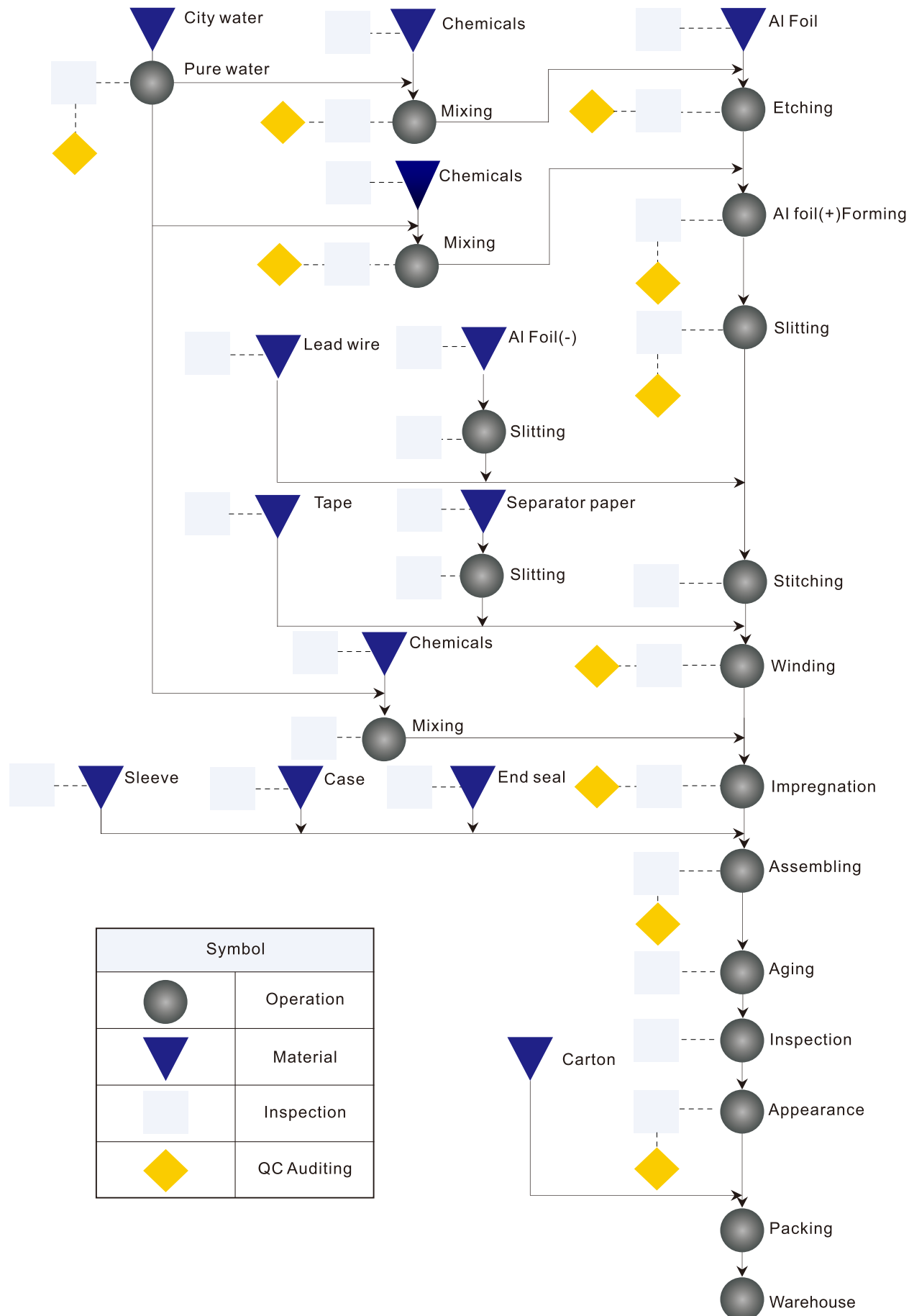
■ Failure Modes

Aluminum Electrolytic Capacitors Show Various Failure Modes in Different Applications



■ Flow Chart

Aluminum Electrolytic Capacitors Flow Chart



Application Guidelines for Conductive Polymer Aluminum Solid Capacitors

● For Multilayer Type

1. Cautions for use

1) Polarity

Conductive polymer aluminum solid capacitors have polarity. When in use, they cannot be reverse charged as this will damage the capacitor oxide film and the capacitors.

2) Ripple current

Do not use the ripple current in excess of the allowable values shown in the "Characteristic Table" as this may cause the capacitor to heat up and damage the capacitor. The total voltage and the AC voltage peak value can not exceed the rated voltage, and no reverse voltage is allowed.

2. Storage condition

1) This product is guaranteed for 2 years when sealed and packaged in a moisture-proof bag under the following conditions; This product needs to be stored in a moisture-proof, humidity-sensitive level 3.

2) Conductive polymer aluminum solid capacitors should be stored in a dry environment, please avoid sunlight and dew condensation, otherwise the following problems may occur:

① Leakage current will increase and damage the circuit.

② Water vapor absorbed by the resin will evaporate and dissipate heat on the surface, damaging the resin.

3) The capacitors should be stored in a dry place after opening the moisture-proof bag. If the capacitors are stored for more than 1 week under the recommended storage environment after opening the bag, it is recommended to perform voltage charging and baking according to the following conditions to solve the problems mentioned in (2)-①-② above;

① Recommended voltage conditions:

Applied voltage: the rated voltage

Charging Time: 30 minutes

Temperature: 25°C

Current Limiting Resistance: 1000 Ω (In series)

② Recommended baking conditions:

Temperature: 60(+0, -5)°C

Time: 168 hours.

● For Radial & SMD Type

I . Device Circuit Design Considerations

1. Prohibited circuits

Conductive polymer solid aluminum electrolytic capacitors (hereinafter referred to as capacitors) may change their leakage current due to thermal stress during soldering. Avoid using them in the following circuits.

① High resistance voltage holding circuits

② Coupling circuits

③ Other circuits where the leakage current is greatly affected.

2. Circuit design

Please design the circuit based on the following contents.

① The electrical characteristics of capacitors change with temperature and frequency.

② When connecting two or more capacitors in parallel, please consider the current balance when designing the circuit.

③ When connecting two or more capacitors in series, overvoltage may occur due to the difference in load voltage. Please consult us separately when using.

④ Do not install heating parts around capacitors or on the back of printed circuit boards.

3. Safety-critical product applications

If the product is to be used in a life-related application (① aerospace equipment, ② nuclear energy equipment, ③ medical equipment) or in an application where the product's defects will have a significant impact on society, please be sure to consult with us before using the product.

4. Polarity

Our conductive polymer capacitors are solid aluminum electrolytic capacitors with polarity. Do not apply a reverse voltage or AC voltage. If the polarity is reversed during installation, the circuit may be shorted in the initial state. Please refer to the dimensional drawings in the catalog or specifications for polarity.

5. Operating voltage

Do not apply a voltage that exceeds the rated voltage, as even a momentary load may cause an increase in leakage current and short-circuit failure. Set the peak value of the ripple voltage superimposed on the DC voltage below the rated voltage. It is not necessary to reduce the voltage in any operation. Although the ripple voltage exceeding the rated voltage is specified, if it is below the rated voltage within the temperature range, there are limitations regardless of the ambient temperature, and prolonged use is not guaranteed.

6. Ripple current

Do not apply excessive current that exceeds the rated ripple current. If excessive ripple current is applied, it may result in increased internal heat generation, shortened service life, short circuit failure, etc.

7. Operating temperature

If the capacitor is used out of the category temperature range, performance deterioration and malfunction may occur.

8.Charging and discharging

Do not use capacitors in circuits subject to repeated rapid charging and discharging. Otherwise, the capacitance may be reduced and the capacitor may be damaged by internal heat generation. If the peak current value exceeds 10A, it is recommended that a protective circuit be used to maintain reliability.

9.Leakage current

Sometimes the leakage current rises, but if the voltage is loaded within the operating temperature, it gradually decreases by self-healing. In addition, the leakage current decreases faster the closer it gets to the upper operating temperature and the rated voltage. The reasons for the increase in leakage current are as follows.

① Welding

② High temperature and no load, high temperature and high humidity, rapid temperature change and other tests.

10. Failure mode

① The failure rate can be reduced by reducing the ambient temperature, ripple current, and load voltage.

② Open mode damage caused by a reduction of electrostatic capacity due to an increase in product temperature and an increase in ESR are the main failure modes. Occasionally, short-circuit mode may occur due to excessive voltage and large current.

③ If a short-circuit is caused by the load voltage exceeding the rated voltage or the current is too high, the aluminum case may expand or peel off due to the increase in internal pressure and emit a foul odor.

④ The material of the product contains flammable substances. The short-circuit area may catch fire due to electric sparks, etc. Please take the following design considerations into account when installing, positioning, and graphically designing the product to ensure absolute safety.

＊ Protective circuits and devices are provided to ensure the safety of the equipment.

＊ Provide redundant circuits, etc., so that the equipment does not become unstable due to a single failure.

11. Insulation

The aluminum case of the capacitor is not insulated. Provide electrical insulation between the capacitor case and the cathode terminal, the anode terminal and the printed circuit board.

12. Operating conditions

Do not use/expose capacitors to the following conditions.

① Water, salty water and oil. Avoid storage in damp locations.

② Direct sunlight.

③ Toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine and its compounds, bromine and its compounds, ammonia, etc.

④ Ozone, ultraviolet rays, or radiation.

⑤ Severe vibration or mechanical shock conditions beyond the limits prescribed in the catalogs or the product specification.

13. Configuration

① For a surface mount capacitor, design the copper pads of the PC board in accordance with the catalog or the product specifications.

② For a radial type capacitor, provide the appropriate hole spacing on the PC board to match the lead spacing of the capacitor.

③ Do not wire the circuit underneath the capacitor's seal. When wiring near the capacitors, make sure the wires are spaced 1mm (2mm if possible) or more apart.

④ When designing double-sided printed circuit boards, do not place substrate holes or through-holes below the capacitor mounting position.

⑤ When mounting a capacitor on a double-sided PCB, the capacitor mounting position cannot configure lines.

II. Installation

1. Assembling

① Do not reuse capacitors that have been assembled and electrified.

② Regenerative voltage may be generated inside the capacitor. In this case, discharge the capacitor through a resistor of approximately 1kΩ.

③ The leakage current of the capacitors may increase if they are stored for a long period of time under conditions other than room temperature of 35℃ and humidity of 75%RH, or for a period of time other than the period specified in the catalog or specification. In this case, discharge the capacitor through a resistor of about 1kΩ before use.

④ Check the rated specifications (capacitance and rated voltage) of the capacitor before installation.

⑤ Check the polarity of the capacitor before installation.

⑥ Do not use a capacitor that has been dropped on the floor.

⑦ Do not deform the capacitor during installation.

⑧ Check that the terminal spacing of the capacitor and the hole spacing of the printed wiring board are aligned before installation.

⑨ Do not apply a force to the capacitor that exceeds the mechanical strength specified in the catalog or specifications. If excessive force is applied to the capacitor, the terminals may break or be deformed, which may interfere with installation. It may also cause short-circuiting, breakage, increased leakage current, and damage to the case. The automatic assembly machine may also generate stress when adsorbing and mounting as well as leads cutting, so be aware of its impact force.

2. Soldering and heat resistance

Please set the soldering conditions refer to our recommended conditions. Leakage current may increase and capacitance may decrease due to thermal stress from soldering, etc. When the voltage is applied at conditions that are below the upper operating temperature, the increasing leakage current will gradually decrease. In addition, the leakage current is improved by self-healing, and the closer the condition is to the upper operating temperature and rated voltage, the faster the self-healing will be.

1) When soldering with a soldering iron

① Soldering conditions (temperature and time) should be within the limits prescribed in the catalogs or the product specifications.

② Do not touch the capacitor body with the hot tip of the soldering iron

2) Flow soldering (Wave soldering)

① Do not dip the body of a capacitor into the solder bath, only dip the terminals in. Soldering must be done on the backside of the PCB with capacitors.

② Soldering conditions should be within the limits prescribed in the catalogs or the product specifications.

③ Do not apply flux to any part of capacitors other than their terminals.

④ Make sure the capacitors do not come into contact with any other components while soldering.

＊ Please note that SMD type products are not suitable for flow soldering!

3) Reflow soldering

① Soldering conditions (preheat, solder temperature and time) should be within the limits prescribed in the catalog or the product specification.

② The type and position of the heater in the reflow oven, and even the color and material of the capacitor may affect the temperature stress to which the capacitor is subjected, so please pay attention to the degree of heating.

＊ Please note that except for SMD type products, other types of capacitors cannot be reflow soldered.

4) Do not reuse a capacitor once it has been installed. When reinstalling a capacitor in the same location, remove the flux and use a soldering iron to install the capacitor under the specified conditions.

3. Handling After Soldering

Do not apply any mechanical stress to the capacitor after soldering onto the PC board.

① Do not lean or twist the body of the capacitor after soldering the the capacitor onto the PC board.

② Do not use the capacitors for lifting or carrying the assembly board.

③ Do not allow other objects to collide with the capacitor. When stacking the assembly board, be careful that other components do not touch the aluminum electrolytic capacitors.

④ Do not drop the assembly board.

4. Cleaning PC board

1) Do not clean capacitors with the following agents. If cleaning is required, do not exceed the conditions specified in the catalog or specifications. Please pay special attention to the conditions for ultrasonic cleaning.

Halogenated solvents →Capacitor failure due to electrochemical corrosion.

Alkaline solvents →Corrosion (dissolution) of aluminum case

Terpene, petroleum solvents → deterioration of sealing rubber plug

Xylene, toluene → deterioration of sealing rubber plug

Acetone → labeling disappears

＊ Please consult us before using CFC alternatives or other cleaning agents.

2) Check the following points when cleaning capacitors.

① Pay attention to the contamination management of the cleaning agent (conductivity, pH, specific gravity, water content, etc.).

② After cleaning the capacitors, do not store them in cleaning solution or sealed containers. In addition, please dry the aluminum electrolytic capacitors sufficiently by blowing them with hot air (below the upper operating temperature) for more than 10 minutes to avoid the residue of cleaning solution on the PCB and capacitors. Generally, aluminum electrolytic capacitors react easily with halogen ions (especially chloride ions), and the degree of reaction varies depending on the electrolyte used and the packaging material, etc. However, when a certain amount of halogen ions intrude into the interior, it can lead to corrosive reactions during use and cause

destructive failures such as a large increase in the leakage current, heat generation, and open circuit.

3) Use the following cleaning conditions when cleaning with the following new solvents.

① Highly concentrated ethanol-based cleaners

Cleaning conditions: Immersion in a liquid at a temperature of 60℃ or less for no more than 10 minutes, or ultrasonic cleaning. Regardless of the cleaning method, do not wipe other parts or the labeled portion of the capacitor on the PCB. Note that rinsing with a cleaning solution may be harmful to the labeled portion of the capacitor.

② CFC alternatives

Cleaning conditions: Please do not immerse the product in liquid, ultrasonic waves or steam for more than 5 minutes. The use of CFC alternatives will be gradually banned from the perspective of global environment, so please take this as a temporary measure and avoid using it as much as possible.

③ Isopropanol

Immersion cleaning (Please keep the flux concentration less than 2wt% relative to the cleaning solution.)

5. Precautions for using adhesives and coating agent

1) Do not use fixatives or coatings containing halogenated solvents.

2) Check the following when using fixatives and coatings on capacitors.

① Do not leave flux residue or dirt between the PCB and the capacitor seal.

② Dry and remove the cleaning solution before applying the fixative and coating. Do not completely cover the seal area.

③ Consult us for the heat curing condition of the fixative and coating agent.

④ If the sealing area of the capacitor is completely blocked with resin, a dangerous situation will occur because the internal pressure inside the capacitor cannot be effectively released. In addition, if there are a large number of halogen ions in the fixing agent and coating agent, they may penetrate through the sealing rubber into the inside of the capacitor and cause an abnormality, so please get in touch with us.

⑤ Some coating materials, it can not be implemented on the capacitor.

6. Fumigation

When importing or exporting electronic equipment, it is sometimes necessary to fumigate with halogen compounds such as methyl bromide. If aluminum electrolytic capacitors come into contact with halogen compounds such as methyl bromide, there is a risk of corrosion due to the generation of halogen ions.

Our company adopts the packaging method without fumigation treatment. When importing or exporting electronic equipment, semi-finished products or aluminum electrolytic capacitors, please pay attention to the presence or absence of fumigation treatment and the final packaging form. (There is a risk of fumigant gas entering even if they are packaged in corrugated cardboard or plastic).

III.The Operation of Devices

1. Do not have direct contact with the capacitor terminals.

2. There must be no conductive material between the capacitor terminals, otherwise there is a risk of short circuit.

In addition, do not splash conductive solutions such as acidic and alkaline solutions on the capacitors.

3. Check the installation environment of the circuit with capacitors.

Do not use/expose capacitors to the following conditions.

① Splash water or oil.

② Direct sunlight.

③ Ozone, ultraviolet rays, or radiation.

④ Toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine and its compounds, bromine and its compounds, and ammonium.

⑤ Severe vibration or mechanical shock conditions beyond the limits prescribed in the catalogs or the product specification.

IV. Maintenance Inspection

1. Periodically inspect capacitors used in industrial equipment.

When performing maintenance checks on capacitors, disconnect power to the equipment and discharge the stored electricity in the capacitors. When checking with a multimeter, check the polarity of the multimeter before use. Also, be careful not to stress the lead terminals.

2. Please make regular inspections as follows.

① Appearance for obvious abnormality

② Electrical performance (leakage current, capacitance, DF value and items specified in the catalog or specification).

＊ If there is any abnormality in the above items, confirm the specifications of the capacitor and replace it accordingly.

V.Contingencies

1) Disconnect the main power supply or unplug the power cord from the wall outlet if gas is emitted from the capacitor, if a short circuit causes combustion, or if a foul odor or smoke is emitted.

2) If the capacitor is abnormal or burns, there is a possibility that the outer packaging resin, etc. may burn and decompose, producing gas. Keep your face and hands away from it. If the discharged gas enters your eyes or is inhaled, immediately wash your eyes and mouth with water. If it gets on your skin, wash it with soap.

VI.Storage

The following storage conditions are recommended.

1) Do not store capacitors in high temperature or high humidity environments. Store the capacitors at a room temperature of 5 to 35℃ and a humidity of 75% or less.

Refer to the following table for the storage period.

	Before unpacking	After unpacking
SMD Type	Within 6 months after delivery	Within 7 days of package opening date
Radial Type	Within 12 months after delivery	Within 30 days of package opening date

① SMD products are sealed in a PE plastic bag. Please use all capacitors within the disposal period once the bag is opened.

② If you need to store the unpacked product, please put it back into the bag and seal it with a zipper.

③ Be sure to follow our reflow soldering recommendations.

2) Store the capacitors away from direct contact with water, salt water, and oil.

3) Do not store capacitors in an environment containing harmful gases (hydrogen sulfide, sulfurous acid, nitrous acid, chlorine and its compounds, halogenated gases such as bromine, halogenated compounds such as methylene bromide, ammonia, etc.).

4) Do not store the capacitors in an environment exposed to ozone, ultraviolet rays, or radiation.

5) It is recommended that capacitors be stored in their original packaging whenever possible.

VII.Disposal

For disposal of capacitors, please contact a local industrial waste disposal company.

VIII.RoHS & REACH

1) Our products comply with the RoHS Directive and other regulations on environmentally hazardous substances.

2) Our products comply with the REACH regulation and other regulations on environmentally hazardous substances.

IX.Catalogs

Catalog specifications are subject to change without notice. Test data shown in catalogs is not guaranteed as total performance, but is typical.

Application Guidelines for Aluminum Electrolytic Capacitors

■ Designing Device Circuits

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

2. Polarity

Aluminum Electrolytic Capacitors are polarized.

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

3. Operating voltage

Do not apply a DC voltage that exceeds the rated voltage. The peak voltage of a superimposed AC voltage (ripple voltage) on the DC voltage must not exceed the rated voltage.

A surge voltage value, that exceeds the rated voltage, is prescribed in the catalogs, but it is a restricted condition, for very short periods of time.

4. Ripple current

The rated ripple current has been specified at a certain ripple frequency. The rated ripple current at several frequencies must be calculated by multiplying the rated ripple current at the original frequency using the frequency multipliers for each product series.

5. Category temperature

Capacitors used outside the category temperature range will considerably shorten the lifespan or cause the capacitor to vent.

The relation between the lifetime of aluminum electrolytic capacitors and ambient temperature follows Arrhenius' rule that the lifetime is approximately halved with each 10°C rise in ambient temperature.

6. Life expectancy

Select capacitors that meet the device's service life requirements.

7. Charge and discharge

Do not use capacitors in circuits where heavy charge and discharge cycles are frequently repeated. Frequent and sharp heavy discharging cycles will decrease capacitance and damage to the capacitors due to generated heat. Specified capacitors can be designed to endure such a condition. Rapid charging/discharging may be repeated in a circuit where the ripple voltage at the two terminals of the aluminum electrolytic capacitor fluctuates greatly. If the variation range of voltage exceeds 70Vp-p, please consult us.

8. Failure modes of capacitors

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

9. Insulation

- a) Electrically isolate the following parts of a capacitor from the negative terminal, the positive terminal and the circuit traces.
 - The outer can case of a non-solid aluminum electrolytic capacitor.
 - The dummy terminal of a non-solid aluminum electrolytic capacitor, which is designed for mounting stability.
- b) The outer sleeve of a capacitor is not assured as an insulator (Except for screw type). For applications that require an insulated outer sleeve, a custom-designed capacitor is recommended.

10. Conditions

Do not use/expose capacitors to the following conditions.

- a) Oil, water, salty water. Avoid storage in damp locations.
- b) Direct sunlight.
- c) Toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or its compounds, and ammonium.
- d) Ozone, ultraviolet rays, or radiation.
- e) Severe vibration or mechanical shock conditions beyond the limits prescribed in the catalog or the product specifications.

11. Mounting

- a) The electrolytic paper and the electrolytic-conductive electrolyte in a non-solid aluminum electrolytic capacitor are flammable. Leaking electrolyte on a printed circuit board can gradually erode the copper traces, possibly causing smoke or burning by short-circuiting the copper traces.

Verify the following points when designing a PC board.

- Provide the appropriate hole spacing on the PC board to match the terminal spacing of the capacitor.
- Make the following open space over the vent so that the vent can operate correctly.

Case diameter	Clearance
φ6.3 to φ16mm	2mm minimum
φ18 to φ35mm	3mm minimum
φ40mm or more	5mm minimum

- Do not place any wires or copper traces over the vent of the capacitor.
- Installing a capacitor with the vent facing the PC board needs an appropriate ventilation hole in the PC board.
- Do not pass any copper traces beneath the seal side of a capacitor. The trace must pass 1 or 2mm to the side of the capacitor.
- Avoid placing any heat-generating objects adjacent to a capacitor or even on the reverse side of the PC board.
- Do not pass anything via holes or underneath a capacitor.
- In designing double-sided PC boards, do not locate any copper trace under the seal side of a capacitor.
- b) Do not mount the terminal side of a screw mount capacitor downwards. If a screw terminal capacitor is mounted on its side, make sure the positive terminal is higher than the negative terminal.

Do not fasten the screws of the terminals and the mounting damps over

the specified torque prescribed in the catalog or the product specifications.

- c) For a surface mount capacitor, design the copper pads of the PC board in accordance with the catalog or the product specifications.

12. Others

- a) The electrical characteristics of capacitors vary in respect to temperature, frequency and service life. Design the device circuits by taking these changes into account
- b) Capacitors mounted in parallel need the current to flow equally through the individual capacitors.
- c) Capacitors mounted in series require resistors in parallel with the individual capacitors to balance the voltage.
- d) Using capacitors for applications that always consider safety. Consult with our factory before use in applications which can affect human life. (space equipment, aerial equipment, nuclear equipment, medical equipment, vehicle control equipment, etc.) Please note that the product that is designed only for specific usage can not be used for other purposes. (ex.Photo flash type, etc.)

■ Installing Capacitors

1. Installing

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

2. Soldering and heat resistance

- a) When soldering with a soldering iron
 - Soldering conditions (temperature and time) should be within the limits prescribed in the catalog or the product specifications.
 - If the terminal spacing of a capacitor does not fit the terminal hole spacing of the PC board, reform the terminals in a manner to minimizes mechanical stress on the capacitor body.
 - Remove the capacitors from the PC board, after the solder is completely melted, reworking by using a soldering iron minimizes the mechanical stress on the capacitors.
 - Do not touch the capacitor body with the hot tip of the soldering iron.
- b) Flow soldering (Wave soldering)
 - Do not dip the body of a capacitor into the solder bath, only dip the terminals in. The soldering must be done on the reverse side of the PC board.
 - Soldering conditions (preheat, solder temperature and dipping time) should be within the limits prescribed in the catalog or the product specifications.
 - Do not apply flux to any part of capacitors other than their terminals.
 - Make sure the capacitors do not come into contact with any other components while soldering.
- c) Reflow soldering
 - Soldering conditions (preheat, solder temperature and dipping time) should be within the limits prescribed in the catalog or the product specifications.
 - When setting the temperature of infrared heaters, consider that the infrared absorption causes the material to be discolored and change in appearance.
 - Do not solder capacitors more than once using reflow. If needed, be sure to consult us first.
 - Make sure capacitors do not come into contact with copper traces.
- d) Do not re-use surface mount capacitors that have already been soldered. In addition, when installing a new capacitor onto the assembly board to rework, remove old residual flux from the surface of the PC board, and then use a soldering iron within the prescribed conditions.
- e) Confirm whether reflow soldering is applicable for the capacitors before operation.

3. Handling after soldering

Do not apply any mechanical stress to the capacitor after soldering onto the PC board.

- a) Do not lean or twist the body of the capacitor after soldering the capacitors onto the PC board.
- b) Do not use the capacitors for lifting or carrying the assembly board.
- c) Do not hit or poke the capacitor after soldering to the PC board.

When stacking the assembly board, be careful that other components do not touch the aluminum electrolytic capacitors.

- d) Do not drop the assembly board.

4. Cleaning PC board

- a) Do not wash capacitors by using the following cleaning agents.
 - Halogenated solvents: cause capacitors to fail due to corrosion.
 - Alkali system solvents: corrode (dissolve) an aluminum case.
 - Petroleum and terpene system solvents: cause the rubber seal material to deteriorate.
 - Xylene: causes the rubber seal material to deteriorate.
 - Acetone: erases the marking. Solvent-proof capacitors are only suitable for washing within the cleaning conditions prescribed in the catalogs or the product specifications. In particular, ultrasonic cleaning will accelerate damaging capacitors.

b) Verify the following points when cleaning capacitors.

- Monitor conductivity, pH, specific gravity, and the water content of cleaning agents. Contamination adversely affects these characteristics.
- Be sure not to keep the capacitors in an atmosphere containing the cleaning agent or in an air tight container.

In addition, please dry the solvent sufficiently on the PC board and the capacitor with an air knife (temperature should be less than the maximum rated category temperature of the capacitor) over 10 minutes. Aluminum electrolytic capacitors can be characteristically and catastrophically damaged by halogen ions, particularly by chlorine ions, though the degree of the damage mainly depends upon the characteristics of the electrolyte and rubber seal material. When halogen ions come into contact with the capacitors, the foil corrodes when voltage is applied. This corrosion causes extremely high leakage current, which in turn, causes venting and an open circuit.

5. Precautions for using adhesives and coating agent

- Do not use any adhesive and coating materials containing halogenated solvent.
- Verify the following before using adhesive and coating material.
 - Remove flux and dust leftover between the rubber seal and the PC board before applying adhesive or coating materials to the capacitor.
 - Dry and remove any residual cleaning agents before applying adhesive and coating materials to the capacitors. Do not cover the whole surface of the rubber seal with the adhesive or coating materials.
 - For permissible heat conditions for curing adhesives or coating materials, follow the instructions in the catalog or the product specifications of the capacitors.
 - Covering the whole surface of the capacitor rubber seal with resin may result in a hazardous condition because the inside pressure cannot be released completely. Also, a large amount of halogen ions in resins will cause the capacitors to fail because the halogen ions penetrate into the rubber seal and the inside of the capacitor.
- Some of the coating material cannot be cured over the capacitor. Please note that loose luster and whitening on the surface of the outer sleeve might be caused by the kind of solvents used for mounting adhesives and coating agents.

6. Fumigation

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

■ The Operation of Devices

- Do not touch a capacitor directly with bare hands.
- Do not short-circuit the terminal of a capacitor by letting it come into contact with any conductive object. Also, do not spill conductive liquid such as acid or alkaline solution over the capacitor.
- Do not use capacitors in circumstances where they would be subject to exposure to the following substances:
 - Oil, water, salty water, or damp location.
 - Direct sunlight.
 - Toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid,

chlorine or its compounds, and ammonium.

- Ozone, ultraviolet rays, or radiation.
- Severe vibration or mechanical shock conditions beyond the limits prescribed in the catalog or product specifications.

■ Maintenance Inspection

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

■ In Case of Venting

- If a non-solid aluminum electrolytic capacitor expels gas when venting, it will discharge odors or smoke, or burn in the case of a short-circuit failure. Immediately turn off or unplug the main power supply of the device.
- When venting, a non-solid aluminum electrolytic capacitor blows out gas with a temperature of over 100°C. (A solid aluminum electrolytic capacitor discharges decomposition gas or burning gas while the outer resin case is burning.) Never expose the face close to a venting capacitor.

If your eyes inadvertently become exposed to the spouting gas or you inhale it, immediately flush the open eyes with large amounts of water and gargle with water respectively. If electrolyte is on the skin, wash the electrolyte away from the skin with soap and plenty of water. Do not lick the electrolyte of non-solid aluminum electrolytic capacitors.

■ Storage

We recommend the following conditions for storage.

- Do not store capacitors at a high temperature or in high humidity. Store the capacitors indoors at a temperature of 5 to 35°C and a relative humidity of 75% or below.
- Store the capacitors in places free from water, oil or salt water.
- Store the capacitors in places free from toxic gases (hydrogen sulfide, sulfurous acid, chlorine, ammonium, etc.)
- Store the capacitors in places free from ozone, ultraviolet rays or radiation.
- Keep capacitors in the original package.

■ Disposal

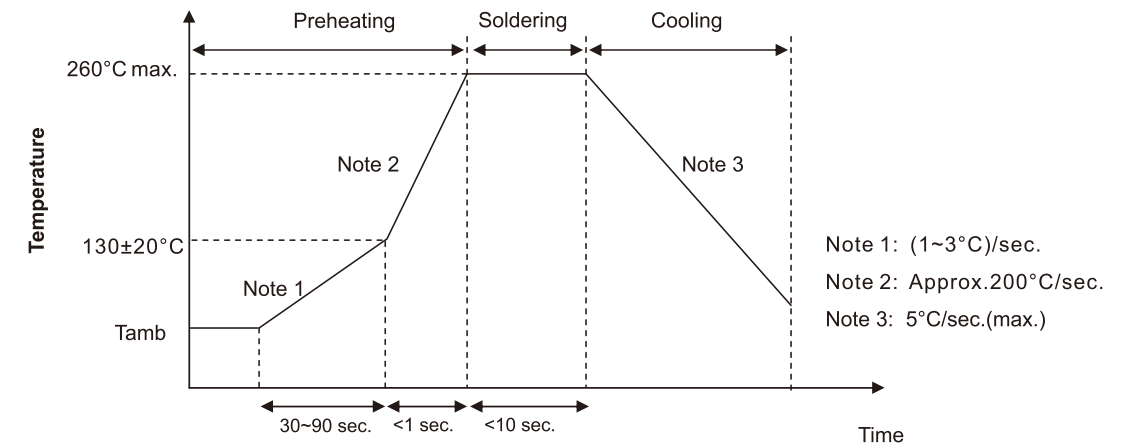
Please consult with a local industrial waste disposal specialist when disposing of aluminum electrolytic capacitors.

■ Catalog

Specifications in the catalog may be subject to change without notice. Please consult us first before use. Hunan Aihua Group reserves the right to the final interpretation of all content.

Soldering Recommendation

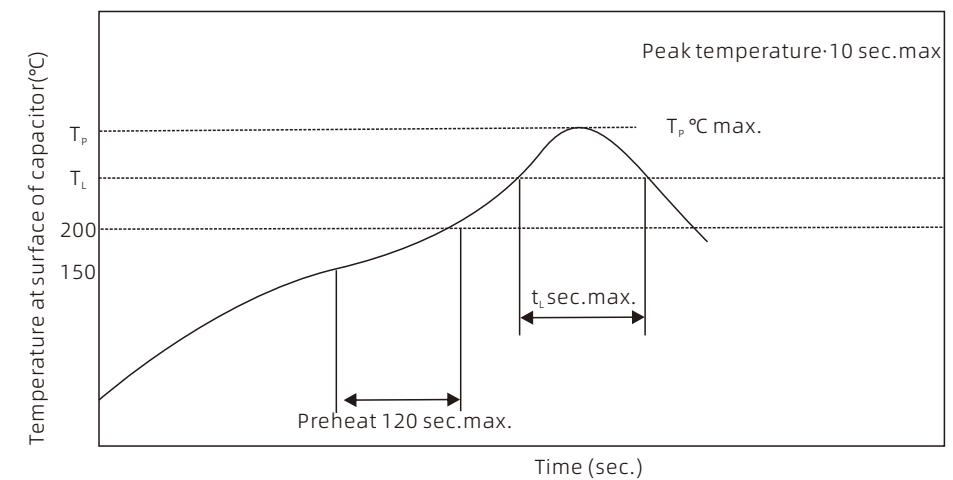
■ Wave Soldering(Radial Lead Type)



■ Reflow Soldering

• (For Polymer Solid Multilayer Type)

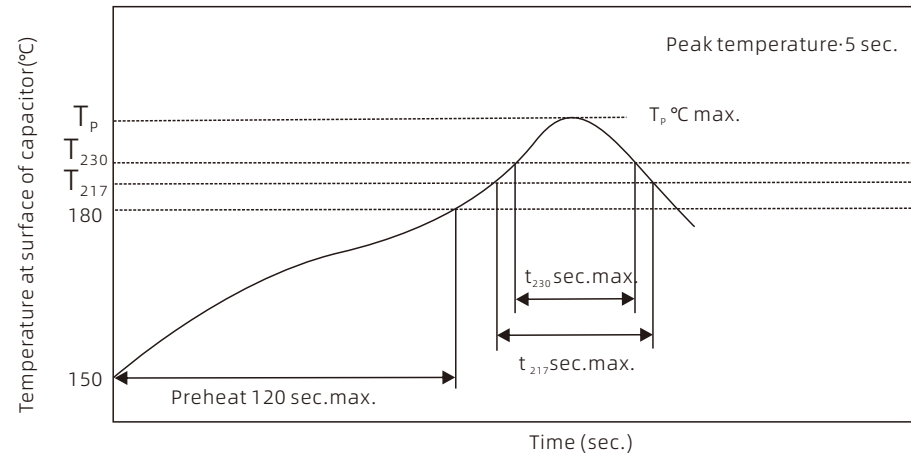
- Temperature at surface of capacitor shall not exceed T_p °C (peak temperature).
- The duration for over T_L °C at surface of capacitor shall not exceed t_L seconds.
- Preheat shall be done at 150°C to 200°C and for Maximum 120 seconds.



Preheat		T_p °C max	T_L (°C)	t_L (sec.) max	Reflow cycle
Temp.(°C)	Time(sec.) max				
150-200	120	260	>217	120	2 times or less

• (For Liquid SMD Type)

- Temperature at surface of capacitor shall not exceed T_P °C (peak temperature) .
- The duration for over T_{217} °C and T_{230} °C at surface of capacitor shall not exceed t_{217} and t_{230} seconds, respectively.
- Preheat shall be done at 150°C to 180°C and for Maximum 120 seconds.

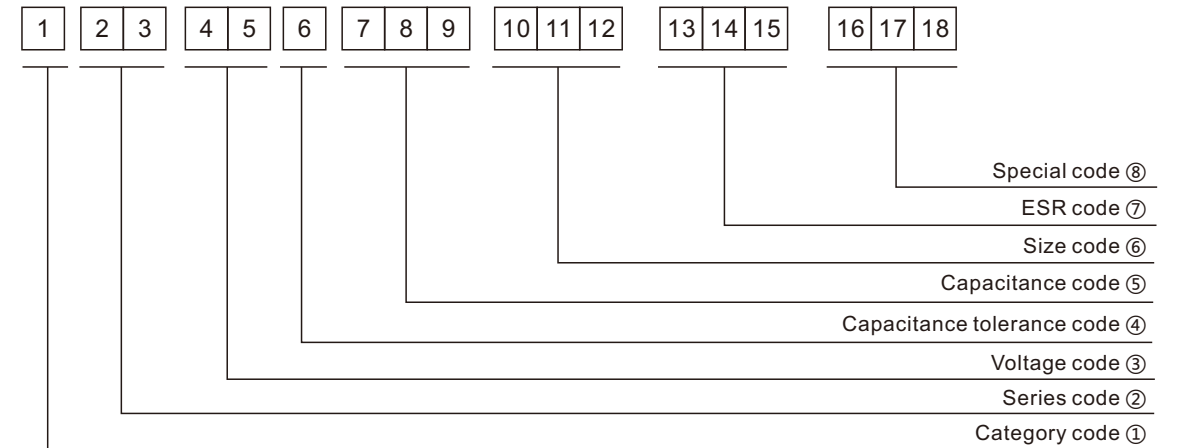


Case size (mm)	Preheat		T_P °C max	T_{217} (°C)	T_{230} (°C)	t_{217} (sec.) max	t_{230} (sec.) max	Reflow cycle
	Temp.(°C)	Time(sec.) max						
φ6.3	150-180	120	250	217	230	60	40	2 times or less
φ8-φ10			245	217	230	60	30	2 times or less
φ12.5-φ18			240	217	230	30	20	2 times or less

■ Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.

• Part Numbering System(Conductive polymer solid capacitors)

• (For Multilayer Type)



① Category code

Type	Code
	1
Conductive polymer aluminum solid capacitor	S

② Series code

Series name		Code	
		2	3
Multilayer Type	A1	A	1
	A2	A	2

③ Voltage code

WV (V)	Code	
	4	5
2	0	B
2.5	0	E
4	0	G
6.3	0	J
7	0	Q
10	1	A
16	1	C
25	1	E
35	1	V
50	1	H

④ Capacitance tolerance code

Tol. (%)	Code	
	6	
-25~+20	Y	
-10~+10	K	
-20~+20	M	
-10~+30	Q	
-10~+20	V	
-0~+20	A	
-5~+20	C	
+6~+20	J	
-10~-20	B	
-15~+15	W	
-15 ~+20	G	
-35 ~+10	L	

⑤ Capacitance code

Cap (uF)	Code		
	7	8	9
4.7	4	R	7
10	1	0	0
15	1	5	0
22	2	2	0
33	3	3	0
47	4	7	0
68	6	8	0
82	8	2	0
100	1	0	1
150	1	5	1
180	1	8	1
200	2	0	1
220	2	2	1
330	3	3	1
470	4	7	1
560	5	6	1

⑥ Size code

L×W (mm)	Code	
	10	
7.3×4.3	A	

T (mm)	Code	
	11	12
0.9	0	9
1.9	1	9
2.8	2	8

⑦ ESR Code

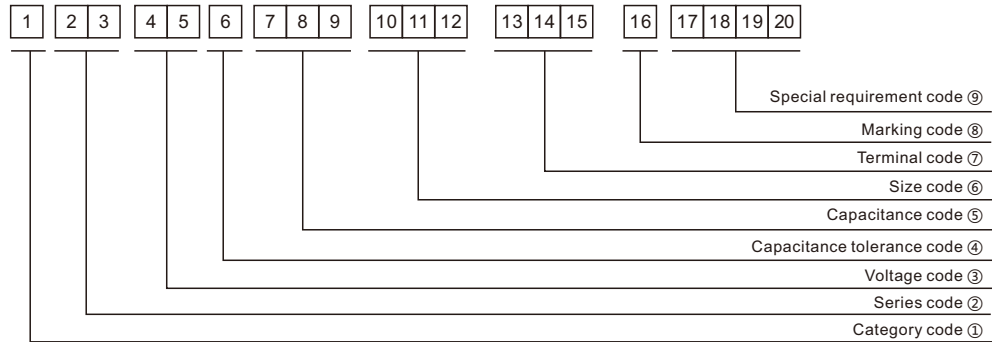
ESR (mΩ)	Code		
	13	14	15
4.5	R	0	4
6.0	R	0	6
7.0	R	0	7
9.0	R	0	9
10	R	1	0
12	R	1	2
15	R	1	5
20	R	2	0
100	R	A	0
120	R	A	2
200	R	B	0
220	R	B	2

⑧ Special Code

Special	Code		
	16	17	18
Special customer requirement	X	X	X

Note: This code is reserved for customers with special requirements. It is used to distinguish custom products from regular products, for example, "F" is the special custom code for a customer.

• (For Radial & SMD Type)



① Category code

Type	Code
	1
Conductive polymer aluminum solid capacitor	S

② Series code

Series name		Code	
		2	3
Radial Type	PZ	P	Z
	PT	P	T
	PF	P	F
	PU	P	U
SMD type	PR	P	R
	VZ	V	Z
	VD	V	D
	VT	V	T
	VF	V	F

③ Voltage code

WV (V)	Code	
	4	5
2	0	B
2.5	0	E
3	0	D
4	0	G
6.3	0	J
6.5	0	F
6.8	0	C
7	0	Q
7.5	0	A
10	1	A
12	1	T
14	1	L
16	1	C
18	1	Q
20	1	D
22	1	I
25	1	E
30	1	S
32	1	F
35	1	V
38	1	N
40	1	G
50	1	H
63	1	J
80	1	B
100	1	K

④ Capacitance tolerance code

Tol. (%)	Code
	6
-10~+10	K
-20~+20	M
-10~+30	Q
-10~+50	T
-10~+20	V
-8~+20	H
0~+20	A
0~+30	
-5~+20	C
+6~+20	J
+6~+30	O
-10~-20	B
-5~-+5	D
0~-+10	E
-5~-20	F
-15~-+5	N
-15~-+15	W
-15~-+20	G
-35~-+10	L
+4~-+30	I

⑤ Capacitance code

Cap (uF)	Code		
	7	8	9
0.1	R	1	0
0.22	R	2	2
1	0	1	0
2.2	2	R	2
9.8	9	R	8
10	1	0	0
22	2	2	0
33	3	3	0
47	4	7	0
56	5	6	0
68	6	8	0
100	1	0	1
150	1	5	1
180	1	8	1
220	2	2	1
270	2	7	1
470	4	7	1
560	5	6	1
680	6	8	1
820	8	2	1
1000	1	0	2
1200	1	2	2
2200	2	2	2
3300	3	3	2

⑥ Size code

φD (mm)	Code
4	C
4.5	A
5	D
5.5	B
6.3	E
6.8	Q
7	R
8	F
10	G
11	H
12	J
12.5	W
13	K
14	X
16	L
18	M
19	Z
20	N

L (mm)	Code	
	11	12
5	0	5
7	0	7
7.5	7	R
8	0	8
9	0	9
10	1	0
11	1	1
12	1	2
16	1	6
20	2	0
25	2	5
10.5	A	R
11.5	B	R
12.5	C	R

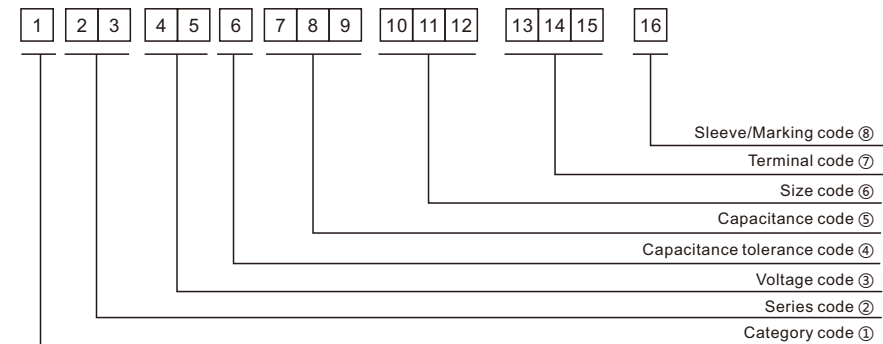
⑦ Terminal code

Specification	Code		
	13	14	15
Bulk packing (standard lead pitch)	O	0	0
Bulk packing (special lead pitch)	O	-	-
Bulk packing (SMD type)	D	0	0
Taping (SMD type)	E	0	0

⑧ Marking code

Marking	Code
Dark blue	B
Baby blue	L
Bright red	R
Sky-blue	S
Black	H
Purple-blue sleeve	V
Red sleeve	O
Black sleeve	A

• Part Numbering System(Aluminum electrolytic capacitors)



① Category code

Type	Code
	1
Aluminum Electrolytic Capacitor	E

② Series code

Series Name	Code	
	2	3
MK	M	K
MF	M	F
MH	M	H
H7	H	7
L7	L	7
WK	W	K
WH	W	H
RR	R	R
RE	R	E
RF	R	F
RS	R	S
RZ	R	Z
RJ	R	J
RH	R	H
HS	H	S
HF	H	F
HT	H	T
HL	H	L
RK	R	K
ML	M	L
RM	R	M
NB	N	B
RD	R	D
GH	G	H
LL	L	L
RG	R	G
HP	H	P

③ Voltage code

WV (Vdc)	Code	
	4	5
2.5	0	E
3	0	D
4	0	G
6.3	0	J
6.8	0	C
7	0	Q
7.5	0	A
10	1	A
12	1	T
16	1	C
25	1	E
35	1	V
40	1	G
50	1	H
63	1	J
80	1	B
100	1	K
160	2	C
180	2	L
200	2	D
220	2	N
250	2	E
315	2	F
350	2	V
380	2	P
400	2	G
420	2	T
450	2	W
500	2	H
550	2	J
600	2	K

④ Capacitance tolerance code

Tol. (%)	Code
	6
-10~+10	K
-20~+20	M
-10~+30	Q
-10~+20	V
0~+20	A
-5~+20	C
-10~-20	B
-5~+5	D
0~+10	E
-5~-20	F
-15~-+5	N
0~+30	3

⑥ Size code

ΦD (mm)	Code
	10
4	C
5	D
6.3	E
8	F
10	G
11	H
12	J
12.5	W
13	K
14.5	X
16	L
18	M
19	Z
20	N
22	O
25	P
30	Q
35	R
40	Y
51.6	S
64.3	T
76.9	U
91	V
100	A

L (SMD) (mm)	Code	
	11	12
5.2	5	5
5.7	6	0
6.3	6	6
7.0	7	3
7.7	8	0
8.0	8	3
8.7	9	0
9.5	9	5
10	A	0
10.5	B	0
11	B	5
11.5	C	0
12	C	5
12.5	D	0
13	D	5
13.5	E	0
16	G	5
16.5	H	0
18	J	5
18.5	K	0
19	K	5
19.5	L	0
20	L	5
20.5	M	0
21	M	5
21.5	N	0

L(other) (mm)	Code	
	11	12
5	0	5
7	0	7
11	1	1
12	1	2
12.5	1	B
13	1	3
16	1	6
20	2	0
25	2	5
30	3	0
35	3	5
40	4	0
46	4	6
50	5	0
60	6	0
80	8	0
100	A	0
115	B	5
120	C	0
130	D	0
140	E	0
160	G	0
200	K	0
220	M	0
236	N	6
250	P	0

Lead Forming (Aluminum electrolytic capacitors)
Taping Specifications

Fig.1 code: X

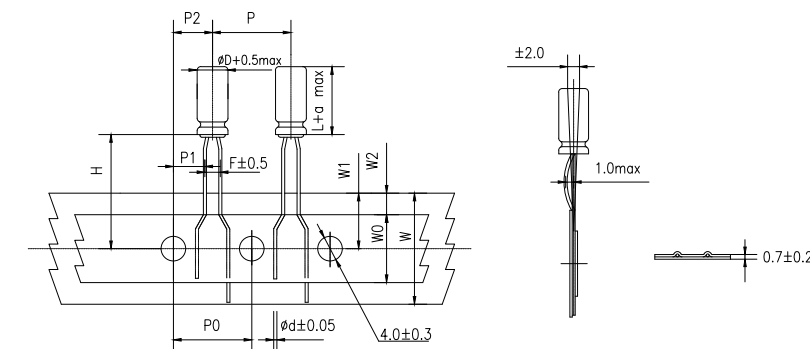


Fig.2 code: B

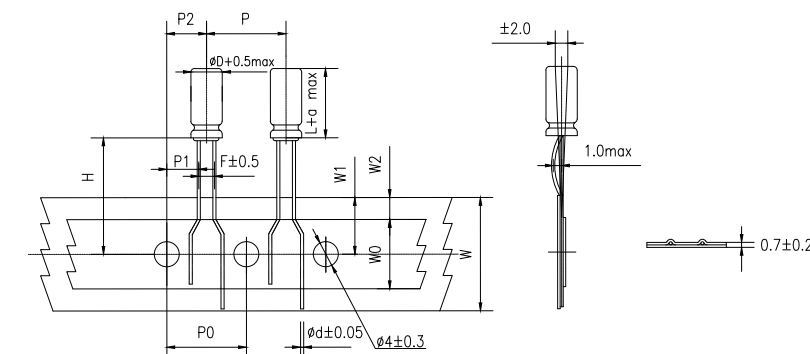


Fig.3 code: B

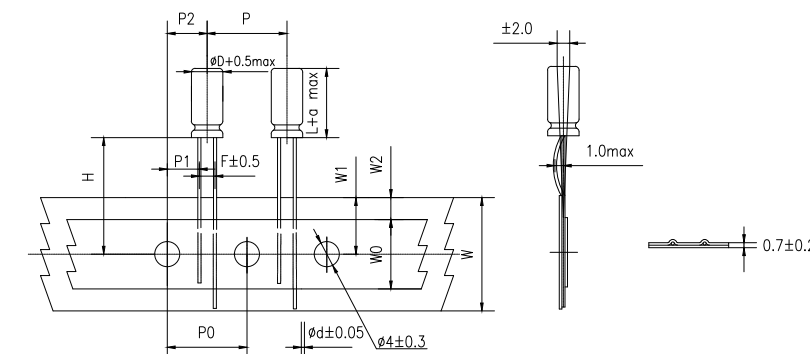
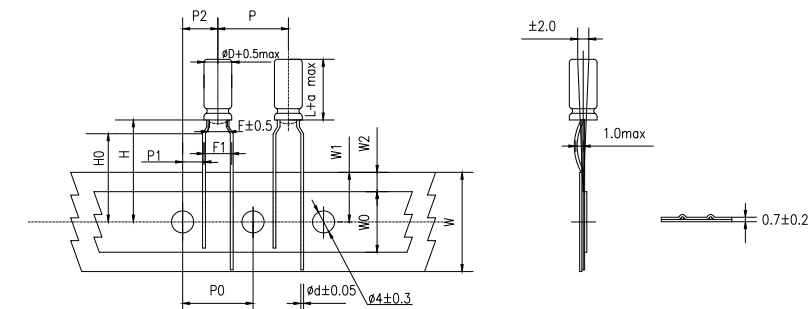


Fig.4 code: P



⑤ Capacitance code

Cap (pF)	Code		
	7	8	9
0.1	R	1	0
0.22	R	2	2
0.33	R	3	3
0.47	R	4	7
0.68	R	6	8
1	0	1	0
2.2	2	R	2
3.3	3	R	3
4.7	4	R	7
6.8	6	R	8
10	1	0	0
22	2	2	0
33	3	3	0
47	4	7	0
68	6	8	0
100	1	0	1
220	2	2	1
330	3	3	1
470	4	7	1
680	6	8	1
1000	1	0	2
2200	2	2	2
3300	3	3	2
4700	4	7	2
6800	6	8	2
10000	1	0	3
22000	2	2	3
33000	3	3	3
68000	6	8	3

⑦ Terminal code

Specification	Code		
	13	14	15
Bulk packing	O	-	-
Platform rubber& straight taping	D	0	0
φ4~8 taping F=5.0mm	P	5	0
φ10~12.5 taping F=5.0mm	B	5	0
Lead cut L=3.5mm	C	3	5
Lead cut L=11.0mm	C	B	O
Lead forming&cut L=4.5mm	F	-	-
Kink&cut L=4.5mm	J	-	-
Snap-in type terminal 4.0mm in length	K	-	-
Three terminal	T	-	-
Ring clip mounting standard design	A	0	0
Ring clip mounting special design	S	-	-

⑧ Sleeve/Marking code

Sleeve	Code
	16
PVC	C
PET	T

Marking	Code
	16
Dark blue	B
Bright Red	R
Sky-blue	S
Light blue	T
Pink	Z
Black	H
Purple-blue	V
Red	O

Lead Forming (Aluminum electrolytic capacitors)

Specification Fig.1 & Fig.2 & Fig.3

(mm)

Items	Symbol	Case size												Tolerance
		4x5 4x7		5x5 5x7		5x11		6.3x5	6.3x7 6.3x9 6.3x11 6.3x12	8x5/7 8x9/11 8x11.5 8x12	8x16 8x20	10x9 10x12 10x13/16 10x20/25	12.5x16 12.5x20 13x20	
Pin code		X	B	X	B	X	B	B	B	B	B	B	B	
Lead wire diameter	φd	0.45		0.45		0.5		0.45	0.5	0.5	0.5/0.6	0.6	0.6	±0.05
Pitch of capacitor body	P	12.7		12.7		12.7		12.7	12.7	12.7	12.7	12.7	15.0	±1.0
Pitch of hole center	P0	12.7		12.7		12.7		12.7	12.7	12.7	12.7	12.7	15.0	±0.2
Distance from hole center to lead	P1	5.1	5.6	5.1	5.35	5.1	5.35	5.1	5.1	4.6	4.6	3.85	5.0	±0.7
Distance from hole center to body center	P2	6.35		6.35		6.35		6.35	6.35	6.35	6.35	6.35	7.5	±1.0
Lead spacing	F	2.5	1.5	2.5	2.0	2.5	2.0	2.5	2.5	3.5	3.5	5.0	5.0	±0.5
Height of body from tape center	H	18.5		18.5		18.5		18.5	18.5	18.5	18.5	18.5	18.5	±0.75
Base tape width	W	18.0		18.0		18.0		18.0	18.0	18.0	18.0	18.0	18.0	±0.5
Adhesive tape width	W0	6.0		6.0		6.0		6.0	8.0	8.0	8.0	11.0	11.0	min
Distance between hole center and base tape	W1	9.0		9.0		9.0		9.0	9.0	9.0	9.0	9.0	9.0	+0.75 -0.5
Distance between base tape and adhesive tape	W2	1.5		1.5		1.5		1.5	1.5	1.5	1.5	1.5	1.5	max

Specification Fig.4

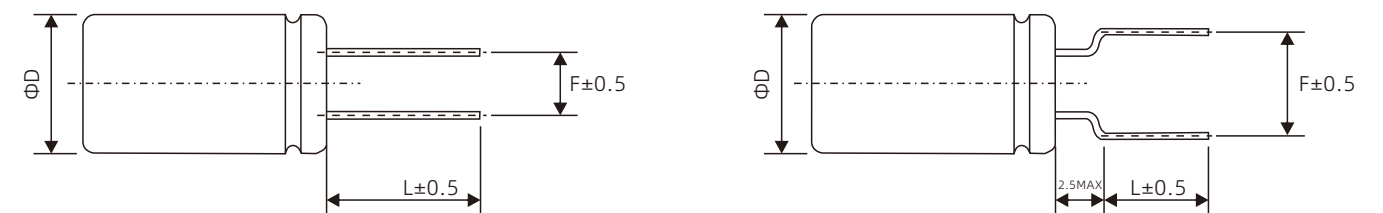
(mm)

Items	Symbol	Case size									Tolerance
		4x5 4x7	5x5	5x7	5x11	6.3x5	6.3x7 6.3x9	6.3x11 6.3x12	8x5/7 8x9/11 8x11.5/12	8x16 8x20	
Pin code		P	P	P	P	P	P	P	P	P	
Lead wire diameter	φd	0.45	0.45	0.45	0.5	0.45	0.5	0.5	0.45/0.5	0.5/0.6	±0.05
Pitch of capacitor body	P	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	±1.0
Pitch of hole center	P0	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	±0.2
Distance from hole center to lead	P1	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	±0.7
Distance from hole center to body center	P2	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	±1.0
Lead-to-lead distance	F	1.5	2.0	2.0	2.0	2.5	2.5	2.5	3.5	3.5	±0.5
Lead spacing	F1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	±0.5
Height of body from tape center	H	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	±0.75
Height of formed lead from tape	B	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	±0.5
Base tape width	W	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	±0.5
Adhesive tape width	W0	6.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0	8.0	min
Distance between hole center and base tape	W1	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	+0.75 -0.5
Distance between base tape and adhesive tape	W2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	max

Lead Forming (Aluminum electrolytic capacitors)
Lead Forming & Cut

Code: C
RANGE: $\phi 4$ - $\phi 18$

Code: F
RANGE: $\phi 4$ - $\phi 8$



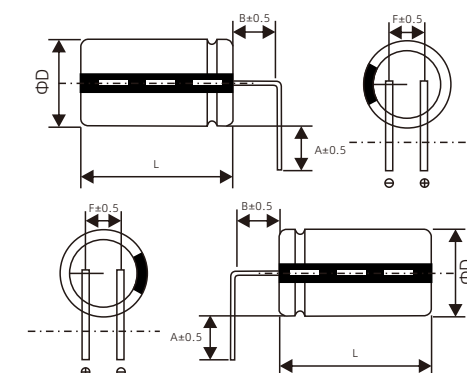
(mm)

ϕD	F	L	ϕD	F	L
4.0	1.5	3.0-12.0	4.0	5.0	3.5, 4.5, 5.0, 7.0
5.0	2.0	3.0-12.0	5.0	5.0	3.5, 4.5, 5.0, 7.0
6.3	2.5	3.0-12.0	6.3	5.0	3.5, 4.5, 5.0, 7.0
8.0	3.5	3.0-12.0	8.0	5.0	3.5, 4.5, 5.0, 7.0
10.0	5.0	3.0-12.0	-	-	,
12.5	5.0	3.0-12.0	-	-	,
16.0	7.5	3.0-12.0	-	-	,
18.0	7.5	3.0-12.0	-	-	,

Code: R/L
RANGE: $\phi 10$ - $\phi 18$

Right horizontal forming

Left horizontal forming



(mm)

ϕD	F	A	B
10-12.5	5.0	2.5, 3.0, 3.5, 4.0, 4.5, 5.0	1.5, 2.5
16-18	7.5	2.5, 3.0, 3.5, 4.0, 4.5, 5.0	1.5, 2.5

Lead Forming (Conductive polymer aluminum solid capacitors)
Taping Specifications

Fig.1 code:P

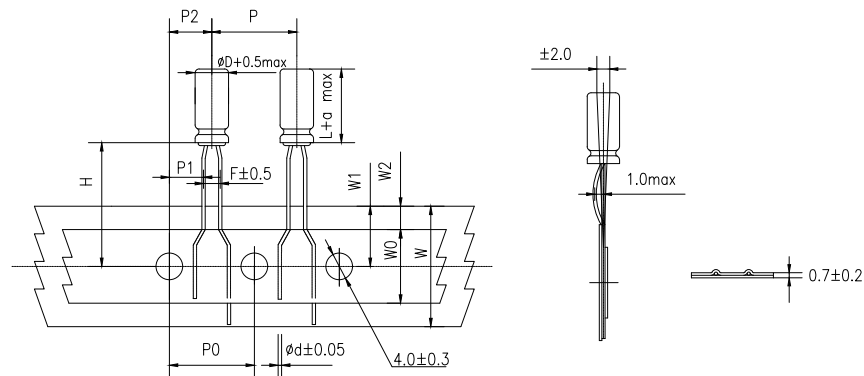


Fig.2 code:P

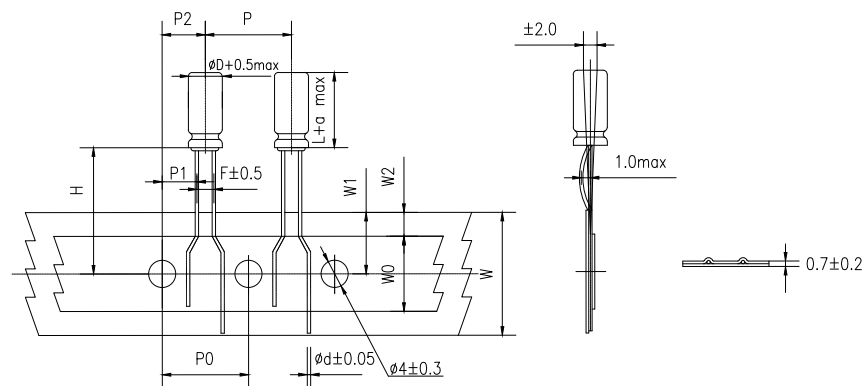


Fig.3 code: P

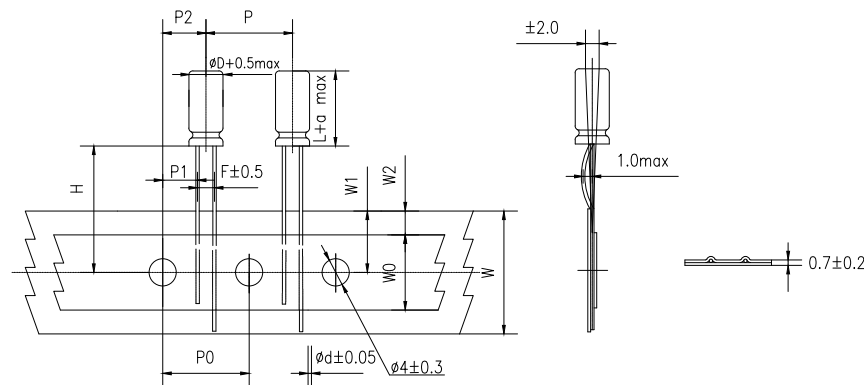
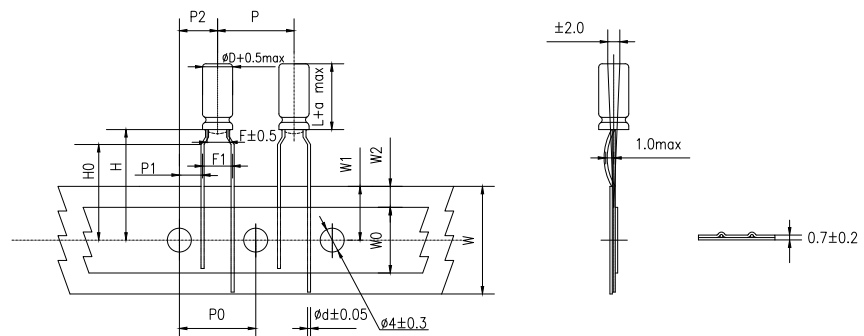


Fig.4 code: K



Lead Forming (Conductive polymer aluminum solid capacitors)
Specification Fig.1 & Fig.2 & Fig.3

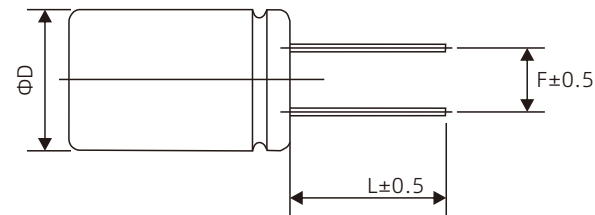
Items	Symbol	Case size						Tolerance
		Φ4.5/Φ5	Φ5.5	Φ6.3	Φ8	Φ8	Φ10	
Pin Code		P	P	P	P	P	P	
Lead wire diameter	φd	0.5	0.5	0.5	0.6	0.6	0.6	±0.05
Pitch of capacitor body	P	12.7	12.7	12.7	12.7	12.7	12.7	±1.0
Pitch of hole center	P0	12.7	12.7	12.7	12.7	12.7	12.7	±0.2
Distance from hole center to lead	P1	5.35	5.1	5.1	5.1	4.6	3.85	±0.7
Distance from hole center to body center	P2	6.35	6.35	6.35	6.35	6.35	6.35	±1.0
Lead spacing	F	2.0	2.5	2.5	2.5	3.5	5.0	±0.5
Height of body from tape center	H	18.5	18.5	18.5	18.5	18.5	18.5	±0.75
Base tape width	W	18.0	18.0	18.0	18.0	18.0	18.0	±0.5
Adhesive tape width	W0	11.0	11.0	11.0	11.0	11.0	11.0	min
Distance between hole center and base tape	W1	9.0	9.0	9.0	9.0	9.0	9.0	+0.75 -0.25
Distance between base tape and adhesive tape	W2	3-0	3-0	3-0	3-0	3-0	3-0	max

Specification Fig.4

Items	Symbol	Case size					Tolerance
		Φ4.5/Φ5	Φ5.5	Φ6.3	Φ8	Φ8	
Pin Code		K	K	K	K	K	
Lead wire diameter	φd	0.5	0.5	0.5	0.6	0.6	±0.05
Pitch of capacitor body	P	12.7	12.7	12.7	12.7	12.7	±1.0
Pitch of hole center	P0	12.7	12.7	12.7	12.7	12.7	±0.2
Distance from hole center to lead	P1	3.85	3.85	3.85	3.85	3.85	±0.7
Distance from hole center to body center	P2	6.35	6.35	6.35	6.35	6.35	±1.0
Lead-to-lead distance	F	2.0	2.5	2.5	2.5	3.5	±0.5
Lead spacing	F1	5.0	5.0	5.0	5.0	5.0	±0.5
Height of body from tape center	H	18.5	18.5	18.5	18.5	18.5	±0.75
Height of formed lead from tape	H0	16.0	16.0	16.0	16.0	16.0	±0.5
Base tape width	W	18.0	18.0	18.0	18.0	18.0	±0.5
Adhesive tape width	W0	11.0	11.0	11.0	11.0	11.0	min
Distance between hole center and base tape	W1	9.0	9.0	9.0	9.0	9.0	+0.75 -0.25
Distance between base tape and adhesive tape	W2	3-0	3-0	3-0	3-0	3-0	max

Lead Forming (Conductive polymer aluminum solid capacitors)
Lead Forming & Cut

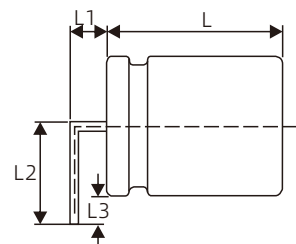
Code: C
RANGE: $\phi 4$ - $\phi 10$



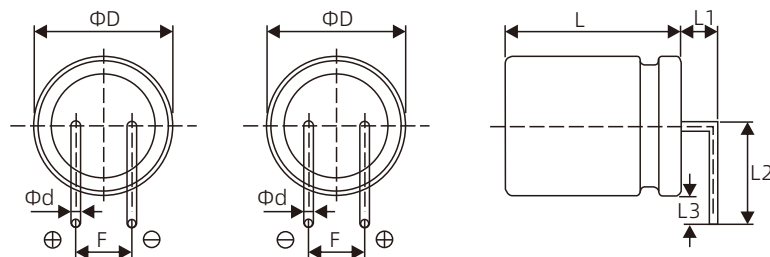
ΦD(mm)	F(mm)	L(mm)
4.5	2.0	2.0~12.0
5.0	2.0	2.0~12.0
6.3	2.5	2.0~12.0
8.0	3.5	2.0~12.0
10.0	5.0	2.0~12.0

Code: R/L
RANGE: $\phi 4$ - $\phi 10$

Left horizontal forming



Right horizontal forming



L1 (mm) Pin included	L2 (mm) Pin included	L3(mm)
2.0 (Min.)	Customization	Customization

A1 series

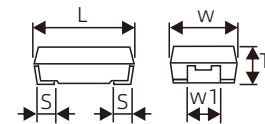
- Endurance: 2,000 hours at 105°C
- Low ESR
- Recommended applications: 5G, server, PC, notebook, GPU, portable charger, small SSD, LED display and industrial equipment
- RoHS Compliant and lead-free



SPECIFICATIONS

Items	Characteristics							
Category Temperature Range	-55~+105°C							
Rated Working Voltage Range	2~25 Vdc							
Nominal Capacitance Range	10~470μF							
Capacitance Tolerance	±20%(M) -35% ~ +10%(L) (20°C,120Hz)							
DC Leakage Current	Is0.1CV , W.V.:2V ~ 25V (at 20°C after 2 minutes)							
	Where, I: leakage current (μA), C: Nominal capacitance (μF), V: Rated voltage (V)							
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	2	2.5	4	6.3	10	16	25
	tanδ (max.)	0.06				0.1		(at 20°C,120Hz)
ESR(100kHz,20°C)	Value in characteristics table							
Endurance	After applying rated voltage for 2,000 hours at 105°C, the capacitors shall meet the following requirements.							
	Appearance	No significant damage						
	Capacitance Change	≤±20% of the initial value						
	D.F. (tanδ)	≤150% of the initial specified value						
	Leakage Current	≤The initial specified value						
Humidity Test	After subjecting to 90%~95% RH for 500 hours at 60°C without voltage applied, the capacitors shall meet the requirement as Endurance.							
	Rated Voltage (Vdc)	2~2.5		4		6.3		10~25
	Capacitance Change	+70, -20 %		+60, -20 %		+50, -20 %		+40, -20 %
	D.F. (tanδ)	≤200 % of the initial specified value						
	Leakage Current	≤300% of the initial specified value						
Surge Test	After subjecting to 1,000 cycles each consisting of the charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.							
	Appearance	No significant damage						
	Capacitance Change	≤±10% of the initial value						
	D.F. (tanδ)	≤The initial specified value						
	Leakage Current	≤The initial specified value						

DIMENSIONS [mm]



Case Size	L±0.3(mm)	W±0.2(mm)	T±0.2(mm)	W1±0.2(mm)	S±0.2(mm)
7.3*4.3*1.9	7.3	4.3	1.9	2.4	1.3

MARKING



PART NUMBERING SYSTEM

S	A	I	0	B	L	3	3	1	A	1	9	R	0	9	X	X	X
															Special code		
															ESR code		
															Size code		
															Capacitance code		
															Capacitance tolerance code		
															Voltage code		
															Series code		
															Category code		

A1 series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size (LxWxT mm)	ESR (mΩ),20°C100kHz (max.)	Rated Ripple Current (mArms)100kHz, 45°C	Leakage Current (uA max) 20°C	Part Number
2	220	7.3×4.3×1.9	9	6,300	44	SA10BM221A19R09XXX
	220	7.3×4.3×1.9	9	6,300	44	SA10BL221A19R09XXX
	270	7.3×4.3×1.9	9	6,300	54	SA10BM271A19R09XXX
	300	7.3×4.3×1.9	9	6,300	60	SA10BM301A19R09XXX
	330	7.3×4.3×1.9	6	7,500	66	SA10BM331A19R06XXX
	330	7.3×4.3×1.9	7	7,000	66	SA10BM331A19R07XXX
	330	7.3×4.3×1.9	9	6,300	66	SA10BM331A19R09XXX
	330	7.3×4.3×1.9	7	7,000	66	SA10BL331A19R07XXX
	330	7.3×4.3×1.9	9	6,300	198	SA10BL331A19R09XXX
	330	7.3×4.3×1.9	9	6,300	66	SA10BL331A19R09X01
	470	7.3×4.3×1.9	4.5	8,500	94	SA10BM471A19R04XXX
	470	7.3×4.3×1.9	6	7,500	94	SA10BM471A19R06XXX
	470	7.3×4.3×1.9	9	6,300	94	SA10BM471A19R09XXX
	470	7.3×4.3×1.9	9	6,300	94	SA10BM471A19R09XXX
2.5	220	7.3×4.3×1.9	9	6,300	55	SA10EM221A19R09XXX
	220	7.3×4.3×1.9	9	6,300	55	SA10EL221A19R09XXX
	270	7.3×4.3×1.9	9	6,300	67.5	SA10EM271A19R09XXX
	330	7.3×4.3×1.9	7	7,000	82.5	SA10EM331A19R07XXX
	330	7.3×4.3×1.9	4.5	8,500	82.5	SA10EM331A19R04XXX
	330	7.3×4.3×1.9	9	6,300	82.5	SA10EM331A19R09XXX
	470	7.3×4.3×1.9	4.5	8,500	117.5	SA10EM471A19R04XXX
	470	7.3×4.3×1.9	6	7,500	117.5	SA10EM471A19R06XXX
	150	7.3×4.3×1.9	16	5,000	60	SA10GM151A19R16XXX
	220	7.3×4.3×1.9	15	5,100	88	SA10GM221A19R15XXX
4	10	7.3×4.3×1.9	55	2,400	6.3	SA10JM100A19R55XXX
	22	7.3×4.3×1.9	45	2,600	13.9	SA10JM220A19R45XXX
6.3	22	7.3×4.3×1.9	80	2,000	13.86	SA10JM220A19R80XXX
	33	7.3×4.3×1.9	80	2,000	20.79	SA10JM330A19R80XXX
	47	7.3×4.3×1.9	25	4,000	29.6	SA10JM470A19R25XXX
	47	7.3×4.3×1.9	35	3,400	29.61	SA10JM470A19R35XXX
	47	7.3×4.3×1.9	40	3,200	29.61	SA10JM470A19R40XXX
	68	7.3×4.3×1.9	15	5,100	42.84	SA10JM680A19R15XXX
	100	7.3×4.3×1.9	15	5,100	63	SA10JM101A19R15XXX
	100	7.3×4.3×1.9	20	4,300	63	SA10JM101A19R20XXX
	100	7.3×4.3×1.9	30	3,700	63	SA10JM101A19R30XXX
	120	7.3×4.3×1.9	10	6,000	75.6	SA10JM121A19R10XXX
	150	7.3×4.3×1.9	10	6,000	94.5	SA10JM151A19R10XXX
	150	7.3×4.3×1.9	15	5,100	94.5	SA10JM151A19R15XXX
	180	7.3×4.3×1.9	15	5,100	113.4	SA10JM181A19R15XXX
	220	7.3×4.3×1.9	10	6,000	138.6	SA10JM221A19R10XXX
	220	7.3×4.3×1.9	15	5,100	138.6	SA10JM221A19R15XXX
	220	7.3×4.3×1.9	15	5,100	138.6	SA10JL221A19R15XXX
10	47	7.3×4.3×1.9	40	3,200	47	SA11AM470A19R40XXX
	68	7.3×4.3×1.9	40	3,200	68	SA11AM680A19R40XXX
	100	7.3×4.3×1.9	15	5,100	100	SA11AM101A19R15XXX
	100	7.3×4.3×1.9	40	3,200	100	SA11AM101A19R40XXX

A1 series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size (LxWxT mm)	ESR (mΩ),20°C100kHz (max.)	Rated Ripple Current (mArms)100kHz, 45°C	Leakage Current (uA max) 20°C	Part Number
10	100	7.3*4.3*1.9	40	3,200	100	SA11AL101A19R40XXX
16	22	7.3×4.3×1.9	30	3,700	35.2	SA11CM220A19R30XXX
	22	7.3×4.3×1.9	60	2,300	35.2	SA11CM220A19R60XXX
	33	7.3×4.3×1.9	80	2,000	52.8	SA11CM330A19R80XXX
	47	7.3×4.3×1.9	55	2,400	75.2	SA11CM470A19R55XXX
25	10	7.3×4.3×1.9	35	3,400	25	SA11EM100A19R35XXX
	10	7.3×4.3×1.9	60	2,300	25	SA11EM100A19R60XXX
	10	7.3×4.3×1.9	80	2,000	25	SA11EM100A19R80XXX
	15	7.3×4.3×1.9	60	2,300	37.5	SA11EM150A19R60XXX
	22	7.3×4.3×1.9	60	2,300	55	SA11EM220A19R60XXX
	33	7.3×4.3×1.9	40	3,200	82.5	SA11EM330A19R40XXX
	33	7.3×4.3×1.9	60	2,300	82.5	SA11EM330A19R60XXX
	33	7.3×4.3×1.9	80	2,000	82.5	SA11EM330A19R80XXX
	33	7.3×4.3×1.9	80	2,000	82.5	SA11EM330A19R80XXX

※Specifications subject to change without notice

Conductive Polymer
Multilayer Type

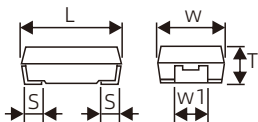
A2 series

- Endurance: 2,000 hours at 105°C
- Low ESR
- Recommended applications: 5G, server, PC, notebook, GPU, portable charger, small SSD, LED display and industrial equipment
- **RoHS Compliant and lead-free**



SPECIFICATIONS

Items	Characteristics									
Category Temperature Range	-55~+105°C									
Rated Working Voltage Range	2~16 Vdc									
Nominal Capacitance Range	47~470μF									
Capacitance Tolerance	±20%(M) -35% ~ +10%(L) (20°C,120Hz)									
DC Leakage Current	I≤0.1CV , W.V.:2V ~ 16V (at 20°C after 2 minutes) Where, I: leakage current (μA), C: Nominal capacitance (μF), V: Rated voltage (V)									
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	2	2.5	4	6.3	10	16	(at 20°C,120Hz)		
	tanδ (max.)	0.06					0.1			
ESR(100kHz,20℃)	Value in characteristics table									
Endurance	After applying rated voltage for 2,000 hours at 105°C, the capacitors shall meet the following requirements.									
	Appearance	No significant damage								
	Capacitance Change	±±20% of the initial value								
	D.F. (tanδ)	≤150% of the initial specified value								
	Leakage Current	≤The initial specified value								
Humidity Test	After subjecting to 90%~95% RH for 500 hours at 60℃without voltage applied, the capacitors shall meet the requirement as Endurance.									
	Rated Voltage (Vdc)	2~2.5			4		6.3		10~16	
	Capacitance Change	+70, -20 %			+60, -20 %		+50, -20 %		+40, -20 %	
	D.F. (tanδ)	≤200 % of the initial specified value								
	Leakage Current	≤300% of the initial specified value								
Surge Test	After subjecting to 1,000 cycles each consisting of the charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.									
	Appearance	No significant damage								
	Capacitance Change	≤±10% of the initial value								
	D.F. (tanδ)	≤The initial specified value								
	Leakage Current	≤The initial specified value								

■ DIMENSIONS [mm]

Case Size	L±0.3(mm)	W±0.2(mm)	T±0.2(mm)	W1±0.2(mm)	S±0.2(mm)
7.3*4.3*2.8	7.3	4.3	2.8	2.4	1.3

MARKING



■ PART NUMBERING SYSTEM

The diagram illustrates the mapping of a 10-digit resistor code to its corresponding EIA-96 values. The code is divided into three groups: a 3-digit series code, a 3-digit tolerance code, and a 4-digit value code. The mapping is as follows:

Code Digit	Value	Parameter
1	S	Category code
2	A	Series code
3	2	Voltage code
4	0	Capacitance tolerance code
5	B	Capacitance code
6	L	Size code
7	3	ESR code
8	3	Special code
9	1	Special code
10	A	Special code
11	2	Special code
12	8	Special code
13	R	Special code
14	0	Special code
15	9	Special code
16	X	Special code
17	X	Special code
18	X	Special code

A2 series

■ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size (LxWxT mm)	ESR (mΩ),20°C100kHz (max.)	Rated Ripple Current (mA rms)100kHz, 45°C	Leakage Current (uA max) 20°C	Part Number
2	330	7.3×4.3×2.8	9	6,300	66	SA20BM331A28R09XXX
	470	7.3×4.3×2.8	9	6,300	94	SA20BM471A28R09XXX
2.5	270	7.3×4.3×2.8	9	6,300	67.5	SA20EM271A28R09XXX
	330	7.3×4.3×2.8	7	7,000	82.5	SA20EM331A28R07XXX
	330	7.3×4.3×2.8	9	6,300	82.5	SA20EM331A28R09XXX
	470	7.3×4.3×2.8	4.5	8,500	117.5	SA20EM471A28R04XXX
	470	7.3×4.3×2.8	6	7,500	117.5	SA20EM471A28R06XXX
	470	7.3×4.3×2.8	9	6,300	117.5	SA20EM471A28R09XXX
4	220	7.3×4.3×2.8	15	5,100	88	SA20GM221A28R15XXX
	330	7.3×4.3×2.8	15	5,100	132	SA20GM331A28R15XXX
6.3	150	7.3×4.3×2.8	10	6,000	94.5	SA20JM151A28R10XXX
	150	7.3×4.3×2.8	15	5,100	94.5	SA20JM151A28R15XXX
	220	7.3×4.3×2.8	10	6,000	138.6	SA20JM221A28R10XXX
	220	7.3×4.3×2.8	15	5,100	138.6	SA20JM221A28R15XXX
	100	7.3×4.3×2.8	15	5,100	100	SA21AM101A28R15XXX
10	100	7.3×4.3×2.8	40	3,200	100	SA21AM101A28R40XXX
	47	7.3×4.3×2.8	30	3,800	75.2	SA21CM470A28R30XXX
16	68	7.3×4.3×2.8	30	3,800	108.8	SA21CM680A28R30XXX

※ Specifications subject to change without notice

PZ series

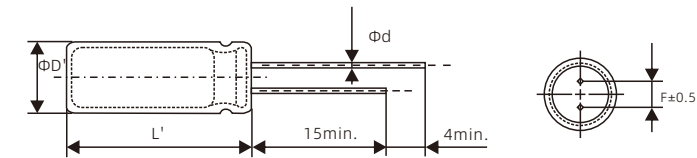
- Endurance: 2,000 hours at 105°C
- Standard
- Recommended applications: system board,display card,small charger and intelligent TV
- RoHS Compliant and lead-free



SPECIFICATIONS

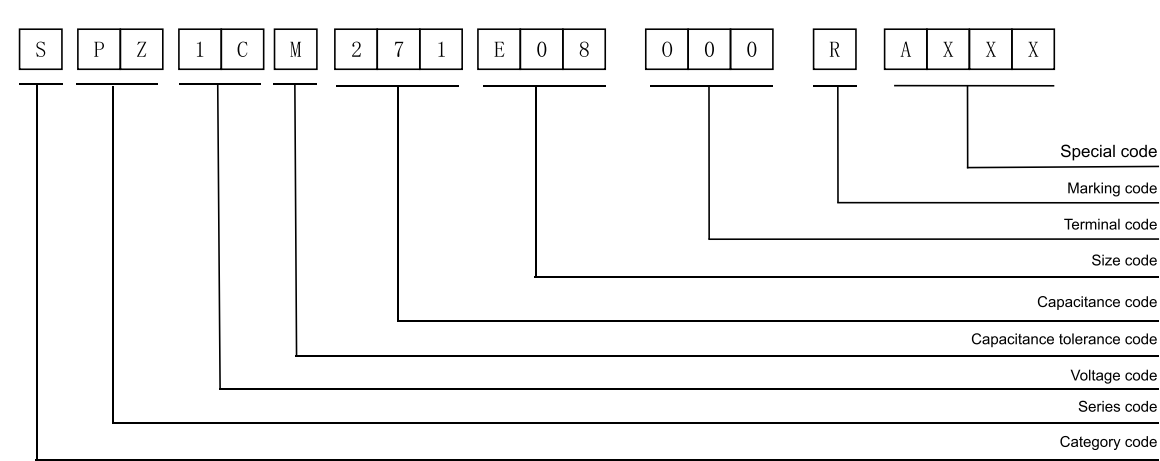
Items	Characteristics																
Category Temperature Range	-55~+105°C																
Rated Working Voltage Range	6.3~125 Vdc																
Nominal Capacitance Range	4.7~5,600μF																
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)																
DC Leakage Current	I≤0.2CV or 500μA, whichever is greater.																
	Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)																
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	6.8	7	7.5	10	12	16	20	25	35	50	63	80	100	125	(at 20°C,120Hz)
	Dissipation Factor (Max.)	0.08				0.12						0.15					
ESR(100kHz,20°C)	Value in the characteristics table																
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+105°C)/Z(+20°C)≤1.5 Z(-55°C)/Z(+20°C)≤2.0																
Endurance	After applying rated voltage for 2,000 hours at 105°C,the capacitors shall meet the following requirements.																
	Appearance	No significant damage															
	Capacitance Change	≤±20% of the initial value															
	Dissipation Factor	≤150% of the initial specified value															
	ESR	≤150% of the initial specified value															
	Leakage Current	≤The initial specified value															
Humidity Test	After subjecting to 90%~95% RH for 1,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.																
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.																
	Appearance	No significant damage															
	Capacitance Change	≤±20% of the initial value															
	Dissipation Factor	≤150% of the initial specified value															
	ESR	≤150% of the initial specified value															
	Leakage Current	≤The initial specified value															

DIMENSIONS [mm]



ΦD	5	5.5	6.3	8	10
Φd	0.5	0.5	0.5	0.6	0.6
F	2	2.5	2.5	3.5	5
ΦD'	ΦD-0.1~+0.5	ΦD-0.3~+0.3	ΦD-0.1~+0.5		
L'	L+1.0max.				L-1~+0.5

PART NUMBERING SYSTEM



PZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Leakage Current (μA)(max)	Part Number
6.3	100	5×7	30	3,000	500	SPZ0JM101D07O00RAXXX
	220	5×7	20	3,500	500	SPZ0JM221D07O00RAXXX
	220	6.3×7	20	3,900	500	SPZ0JM221E07O00RAXXX
	270	5×7	20	3,800	500	SPZ0JM271D07O00RAXXX
	330	5×8	20	4,000	500	SPZ0JM331D08O00RAXXX
	330	6.3×5	25	3,160	500	SPZ0JM331E05O00RAXXX
	330	6.3×8	15	4,000	500	SPZ0JM331E08O00RAXXX
	390	5×9	20	4,100	500	SPZ0JM391D09O00RAXXX
	470	5×10	20	4,300	592	SPZ0JM471D10O00RAXXX
	470	5.5×9	20	4,100	592	SPZ0JM471B09O00RAXXX
	470	6.3×8	15	4,400	592	SPZ0JM471E08O00RAXXX
	500	5×9	20	4,100	630	SPZ0JM501D09O00RAXXX
	560	5.5×9	20	4,300	706	SPZ0JM561B09O00RAXXX
	560	6.3×8	20	4,800	706	SPZ0JM561E08O00RAXXX
	680	5.5×9	20	4,800	857	SPZ0JM681B09O00RAXXX
	680	6.3×9	20	5,080	857	SPZ0JM681E09O00RAXXX
	680	8×9	20	5,200	857	SPZ0JM681F09O00RAXXX
	820	5.5×12	20	5,000	1,033	SPZ0JM821B12O00RAXXX
	820	6.3×9	20	5,080	1,033	SPZ0JM821E09O00RAXXX
	1,000	6.3×10	10	5,150	1,260	SPZ0JM102E10O00RAXXX
	1,000	8×11	10	5,200	1,260	SPZ0JM102F11O00RAXXX
	1,200	6.3×11	10	5,200	1,512	SPZ0JM122E11O00RAXXX
	1,200	8×11	10	5,300	1,512	SPZ0JM122F11O00RAXXX
	1,500	8×11	10	5,400	1,890	SPZ0JM152F11O00RAXXX
	1,500	10×12	10	5,500	1,890	SPZ0JM152G12O00RAXXX
	1,800	10×10	10	5,560	2,268	SPZ0JM182G10O00RAXXX
	2,200	8×14	10	5,700	2,772	SPZ0JM222F14O00RAXXX
	2,200	10×12	10	5,800	2,772	SPZ0JM222G12O00RAXXX
	3,300	10×14	10	5,900	4,158	SPZ0JM332G14O00RAXXX
	4,700	10×17	10	6,100	5,000	SPZ0JM472G17O00RAXXX
	5,600	10×18	10	6,300	5,000	SPZ0JM562G18O00RAXXX
6.8	220	5×7	20	3,300	500	SPZ0CM221D07O00RAXXX
	270	5×7	20	3,600	500	SPZ0CM271D07O00RAXXX
	270	6.3×8	20	3,900	500	SPZ0CM271E08O00RAXXX
	330	5×8	20	3,800	500	SPZ0CM331D08O00RAXXX
	330	6.3×5	25	3,100	500	SPZ0CM331E05O00RAXXX
	390	5×9	20	3,900	530	SPZ0CM391D09O00RAXXX
	470	5×9	20	4,100	639	SPZ0CM471D09O00RAXXX
	470	6.3×7	20	3,700	639	SPZ0CM471E07O00RAXXX
	560	6.3×8	20	4,500	762	SPZ0CM561E08O00RAXXX
	680	6.3×9	20	4,800	925	SPZ0CM681E09O00RAXXX
	820	6.3×9	20	4,900	1,115	SPZ0CM821E09O00RAXXX
	1,000	6.3×11	12	5,100	1,360	SPZ0CM102E11O00RAXXX
	1,000	8×11	10	5,150	1,360	SPZ0CM102F11O00RAXXX

Conductive Polymer
Radial Type

PZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
7	220	5×7	20	3,200	500	SPZ0QM221D07O00RAXXX
	270	5×8	20	3,400	500	SPZ0QM271D08O00RAXXX
	330	5×9	20	3,600	500	SPZ0QM331D09O00RAXXX
	470	5.5×9	20	3,600	658	SPZ0QM471B09O00RAXXX
	470	6.3×8	20	3,800	658	SPZ0QM471E08O00RAXXX
	560	6.3×8	20	4,000	784	SPZ0QM561E08O00RAXXX
	680	6.3×9	12	4,200	952	SPZ0QM681E09O00RAXXX
	820	6.3×10	12	4,500	1,148	SPZ0QM821E10O00RAXXX
	820	8×9	12	4,600	1,148	SPZ0QM821F09O00RAXXX
7.5	220	5×7	20	3,100	500	SPZ0AM221D07O00RAXXX
	270	5×8	20	3,300	500	SPZ0AM271D08O00RAXXX
	330	5×8	20	3,500	500	SPZ0AM331D08O00RAXXX
	390	5×9	20	3,500	585	SPZ0AM391D09O00RAXXX
	470	5×9	20	3,550	705	SPZ0AM471D09O00RAXXX
	470	5.5×9	20	3,550	705	SPZ0AM471B09O00RAXXX
	470	6.3×7	25	3,200	705	SPZ0AM471E07O00RAXXX
	500	5.5×9	20	3,600	750	SPZ0AM501B09O00RAXXX
	560	6.3×8	20	3,900	840	SPZ0AM561E08O00RAXXX
	680	6.3×9	12	4,100	1,020	SPZ0AM681E09O00RAXXX
	820	6.3×10	12	4,400	1,230	SPZ0AM821E10O00RAXXX
	820	8×9	12	4,550	1,230	SPZ0AM821F09O00RAXXX
	1,000	6.3×11	12	4,500	1,500	SPZ0AM102E11O00RAXXX
	1,000	8×11	12	4,700	1,500	SPZ0AM102F11O00RAXXX
	1,200	8×11	12	4,800	1,800	SPZ0AM122F11O00RAXXX
	1,500	8×11	12	4,900	2,250	SPZ0AM152F11O00RAXXX
	1,800	8×14	12	5,100	2,700	SPZ0AM182F14O00RAXXX
	2,200	10×12	12	5,700	3,300	SPZ0AM222G12O00RAXXX
10	47	5×7	35	2,200	500	SPZ1AM470D07O00RAXXX
	56	5×7	35	2,250	500	SPZ1AM560D07O00RAXXX
	68	5×7	35	2,300	500	SPZ1AM680D07O00RAXXX
	82	5×7	35	2,350	500	SPZ1AM820D07O00RAXXX
	100	5×7	35	2,400	500	SPZ1AM101D07O00RAXXX
	100	6.3×5	30	2,300	500	SPZ1AM101E05O00RAXXX
	120	5×7	20	2,450	500	SPZ1AM121D07O00RAXXX
	150	5×7	20	2,500	500	SPZ1AM151D07O00RAXXX
	180	5×8	20	2,700	500	SPZ1AM181D08O00RAXXX
	180	6.3×7	20	2,800	500	SPZ1AM181E07O00RAXXX
	220	5×9	20	2,820	500	SPZ1AM221D09O00RAXXX
	220	6.3×5	25	2,800	500	SPZ1AM221E05O00RAXXX
	220	6.3×8	15	3,160	500	SPZ1AM221E08O00RAXXX
	270	6.3×8	20	3,100	540	SPZ1AM271E08O00RAXXX
	330	6.3×8	20	3,300	660	SPZ1AM331E08O00RAXXX
	330	8×9	15	3,400	660	SPZ1AM331F09O00RAXXX
	390	6.3×8	20	3,400	780	SPZ1AM391E08O00RAXXX

PZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
10	470	5.5×9	20	3,400	940	SPZ1AM471B09O00RAXXX
	470	6.3×8	20	3,500	940	SPZ1AM471E08O00RAXXX
	470	8×9	15	3,550	940	SPZ1AM471F09O00RAXXX
	560	6.3×10	13	3,600	1,120	SPZ1AM561E10O00RAXXX
	560	8×9	15	3,600	1,120	SPZ1AM561F09O00RAXXX
	680	8×11	12	3,900	1,360	SPZ1AM681F11O00RAXXX
	820	8×11	12	4,000	1,640	SPZ1AM821F11O00RAXXX
	1,000	8×11	12	4,200	2,000	SPZ1AM102F11O00RAXXX
	1,000	10×12	10	5,300	2,000	SPZ1AM102G12O00RAXXX
	1,200	10×12	10	5,450	2,400	SPZ1AM122G12O00RAXXX
	1,500	8×14	10	4,800	3,000	SPZ1AM152F14O00RAXXX
	1,500	10×12	10	5,500	3,000	SPZ1AM152G12O00RAXXX
	1,800	10×13	10	5,800	3,600	SPZ1AM182G13O00RAXXX
	2,200	10×15	10	6,100	4,400	SPZ1AM222G15O00RAXXX
12	330	5.5×9	20	3,100	792	SPZ1TM331B09O00RAXXX
	330	6.3×8	20	3,100	792	SPZ1TM331E08O00RAXXX
	470	5.5×9	20	3,200	1,128	SPZ1TM471B09O00RAXXX
	470	6.3×9	20	3,450	1,128	SPZ1TM471E09O00RAXXX
	560	6.3×10	15	3,400	1,344	SPZ1TM561E10O00RAXXX
	680	6.3×11	15	3,600	1,632	SPZ1TM681E11O00RAXXX
	820	8×11	12	3,800	1,968	SPZ1TM821F11O00RAXXX
	1,000	8×12	12	4,000	2,400	SPZ1TM102F12O00RAXXX
	1,200	8×14	12	4,400	2,880	SPZ1TM122F14O00RAXXX
	1,500	8×16	12	4,800	3,600	SPZ1TM152F16O00RAXXX
16	47	5×7	20	2,050	500	SPZ1CM470D07O00RAXXX
	56	5×7	20	2,100	500	SPZ1CM560D07O00RAXXX
	68	5×7	20	2,150	500	SPZ1CM680D07O00RAXXX
	82	5×7	20	2,200	500	SPZ1CM820D07O00RAXXX
	100	5×7	20	2,250	500	SPZ1CM101D07O00RAXXX
	100	6.3×5	25	2,100	500	SPZ1CM101E05O00RAXXX
	100	6.3×8	20	2,800	500	SPZ1CM101E08O00RAXXX
	120	5×8	20	2,350	500	SPZ1CM121D08O00RAXXX
	150	5×8	20	2,400	500	SPZ1CM151D08O00RAXXX
	180	5×8	20	2,450	576	SPZ1CM181D08O00RAXXX
	180	6.3×7	16	2,500	576	SPZ1CM181E07O00RAXXX
	220	5×10	20	2,600	704	SPZ1CM221D10O00RAXXX
	220	6.3×8	20	2,700	704	SPZ1CM221E08O00RAXXX
	220	6.3×10	15	2,900	704	SPZ1CM221E10O00RAXXX
	270	5.5×9	20	2,750	864	SPZ1CM271B09O00RAXXX
	270	6.3×8	20	2,800	864	SPZ1CM271E08O00RAXXX
	270	8×9	20	2,900	864	SPZ1CM271F09O00RAXXX
	330	5.5×9	20	2,900	1,056	SPZ1CM331B09O00RAXXX
	330	6.3×9	20	2,900	1,056	SPZ1CM331E09O00RAXXX

Conductive Polymer
Radial Type

PZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
16	470	5.5×11	20	3,100	1,504	SPZ1CM471B11O00RAXXX
	470	6.3×11	15	3,200	1,504	SPZ1CM471E11O00RAXXX
	470	8×11	11	3,200	1,504	SPZ1CM471F11O00RAXXX
	560	8×11	11	3,200	1,792	SPZ1CM561F11O00RAXXX
	560	8×13	15	3,300	1,792	SPZ1CM561F13O00RAXXX
	560	10×12	11	3,500	1,792	SPZ1CM561G12O00RAXXX
	680	8×11	15	3,400	2,176	SPZ1CM681F11O00RAXXX
	680	10×12	11	3,600	2,176	SPZ1CM681G12O00RAXXX
	820	8×13	11	3,500	2,624	SPZ1CM821F13O00RAXXX
	820	10×12	11	3,800	2,624	SPZ1CM821G12O00RAXXX
	1,000	8×14	11	3,600	3,200	SPZ1CM102F14O00RAXXX
	1,000	10×12	11	4,000	3,200	SPZ1CM102G12O00RAXXX
	1,200	10×12	12	4,200	3,840	SPZ1CM122G12O00RAXXX
	1,200	10×15	12	4,300	3,840	SPZ1CM122G15O00RAXXX
	1,500	10×12	12	4,800	4,800	SPZ1CM152G12O00RAXXX
	1,500	10×18	12	5,500	4,800	SPZ1CM152G18O00RAXXX
	1,800	10×14	12	5,400	5,000	SPZ1CM182G14O00RAXXX
	2,200	10×15	12	5,500	5,000	SPZ1CM222G15O00RAXXX
	2,200	10×17	12	5,800	5,000	SPZ1CM222G17O00RAXXX
20	120	6.3×8	30	2,300	500	SPZ1DM121E08O00RAXXX
	150	6.3×10	20	2,350	600	SPZ1DM151E10O00RAXXX
	220	8×11	20	2,550	880	SPZ1DM221F11O00RAXXX
	270	8×11	20	2,700	1,080	SPZ1DM271F11O00RAXXX
	330	6.3×10	20	2,350	1,320	SPZ1DM331E10O00RAXXX
	330	8×11	20	2,800	1,320	SPZ1DM331F11O00RAXXX
	470	8×11	20	2,400	1,880	SPZ1DM471F11O00RAXXX
	470	8×16	20	3,000	1,880	SPZ1DM471F16O00RAXXX
	470	10×12	20	3,100	1,880	SPZ1DM471G12O00RAXXX
	560	8×16	20	3,200	2,240	SPZ1DM561F16O00RAXXX
	560	10×12	20	3,100	2,240	SPZ1DM561G12O00RAXXX
	680	8×14	20	2,700	2,720	SPZ1DM681F14O00RAXXX
	680	10×15	20	3,300	2,720	SPZ1DM681G15O00RAXXX
	820	10×18	20	3,400	3,280	SPZ1DM821G18O00RAXXX
25	1,000	10×18	20	3,900	4,000	SPZ1DM102G18O00RAXXX
	6.8	6.3×5	100	1,100	500	SPZ1EM6R8E05O00RAXXX
	10	5×8	70	1,800	500	SPZ1EM100D08O00RAXXX
	22	5×9	60	1,810	500	SPZ1EM220D09O00RAXXX
	33	5×9	50	1,850	500	SPZ1EM330D09O00RAXXX
	39	5×8	60	1,900	500	SPZ1EM390D08O00RAXXX
	47	5×9	60	1,950	500	SPZ1EM470D09O00RAXXX
	56	5×9	60	2,050	500	SPZ1EM560D09O00RAXXX
	68	6.3×7	30	2,100	500	SPZ1EM680E07O00RAXXX
	82	6.3×7	30	2,150	500	SPZ1EM820E07O00RAXXX
	100	6.3×8	30	2,500	500	SPZ1EM101E08O00RAXXX

PZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
25	100	8×11	20	3,000	500	SPZ1EM101F11O00RAXXX
	120	6.3×8	30	2,500	600	SPZ1EM121E08O00RAXXX
	150	6.3×10	20	2,800	750	SPZ1EM151E10O00RAXXX
	180	6.3×10	20	2,800	900	SPZ1EM181E10O00RAXXX
	180	8×9	30	2,500	900	SPZ1EM181F09O00RAXXX
	220	5.5×11	20	1,900	1,100	SPZ1EM221B11O00RAXXX
	220	8×11	20	3,000	1,100	SPZ1EM221F11O00RAXXX
	220	10×12	20	3,500	1,100	SPZ1EM221G12O00RAXXX
	270	8×11	20	3,000	1,350	SPZ1EM271F11O00RAXXX
	330	8×11	20	3,100	1,650	SPZ1EM331F11O00RAXXX
	330	10×10	25	3,100	1,650	SPZ1EM331G10O00RAXXX
	330	10×12	20	3,800	1,650	SPZ1EM331G12O00RAXXX
	470	8×11	20	3,000	2,350	SPZ1EM471F11O00RAXXX
	470	8×16	20	3,400	2,350	SPZ1EM471F16O00RAXXX
	470	10×10	25	3,100	2,350	SPZ1EM471G10O00RAXXX
	470	10×12	20	4,000	2,350	SPZ1EM471G12O00RAXXX
	560	8×12	20	3,100	2,800	SPZ1EM561F12O00RAXXX
	560	10×12	20	4,000	2,800	SPZ1EM561G12O00RAXXX
	680	8×14	20	3,400	3,400	SPZ1EM681F14O00RAXXX
	680	10×12	20	4,100	3,400	SPZ1EM681G12O00RAXXX
	680	10×15	20	4,300	3,400	SPZ1EM681G15O00RAXXX
	820	8×16	20	3,600	4,100	SPZ1EM821F16O00RAXXX
	820	10×12	20	4,100	4,100	SPZ1EM821G12O00RAXXX
	820	10×18	20	4,500	4,100	SPZ1EM821G18O00RAXXX
	1,000	10×18	20	4,500	5,000	SPZ1EM102G18O00RAXXX
35	4.7	5×8	60	1,700	500	SPZ1VM4R7D08O00RAXXX
	10	5×8	60	1,800	500	SPZ1VM100D08O00RAXXX
	15	5×8	60	1,850	500	SPZ1VM150D08O00RAXXX
	22	5×9	100	1,950	500	SPZ1VM220D09O00RAXXX
	33	5×9	50	2,000	500	SPZ1VM330D09O00RAXXX
	39	5×9	50	2,050	500	SPZ1VM390D09O00RAXXX
	47	6.3×7	50	2,400	500	SPZ1VM470E07O00RAXXX
	56	6.3×7	50	2,150	500	SPZ1VM560E07O00RAXXX
	68	6.3×7	50	2,200	500	SPZ1VM680E07O00RAXXX
	82	6.3×7	50	2,250	574	SPZ1VM820E07O00RAXXX
	100	6.3×8	50	2,350	700	SPZ1VM101E08O00RAXXX
	100	8×11	40	2,600	700	SPZ1VM101F11O00RAXXX
	120	6.3×10	40	2,500	840	SPZ1VM121E10O00RAXXX
	150	6.3×10	40	2,550	1,050	SPZ1VM151E10O00RAXXX
	180	6.3×11	40	2,600	1,260	SPZ1VM181E11O00RAXXX
	220	6.3×11	40	2,600	1,540	SPZ1VM221E11O00RAXXX
	220	8×11	40	2,800	1,540	SPZ1VM221F11O00RAXXX
	220	10×12	30	2,900	1,540	SPZ1VM221G12O00RAXXX
	270	10×12	30	3,000	1,890	SPZ1VM271G12O00RAXXX

Conductive Polymer
Radial Type

PZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Leakage Current (μA)(max)	Part Number
35	330	10×12	30	3,100	2,310	SPZ1VM331G12O00RAXXX
	470	10×13	20	3,200	3,290	SPZ1VM471G13O00RAXXX
	560	10×14	20	3,300	3,920	SPZ1VM561G14O00RAXXX
	680	10×16	20	3,400	4,760	SPZ1VM681G16O00RAXXX
	820	10×18	20	3,500	5,000	SPZ1VM821G18O00RAXXX
	1,000	10×18	20	3,700	5,000	SPZ1VM102G18O00RAXXX
50	4.7	5×8	60	1,600	500	SPZ1HM4R7D08O00RAXXX
	10	5×8	70	1,630	500	SPZ1HM100D08O00RAXXX
	10	6.3×7	35	1,850	500	SPZ1HM100E07O00RAXXX
	15	5×8	70	1,660	500	SPZ1HM150D08O00RAXXX
	22	6.3×7	40	1,900	500	SPZ1HM220E07O00RAXXX
	33	6.3×7	40	2,000	500	SPZ1HM330E07O00RAXXX
	47	6.3×8	35	2,100	500	SPZ1HM470E08O00RAXXX
	56	6.3×8	35	2,120	560	SPZ1HM560E08O00RAXXX
	68	6.3×10	30	2,150	680	SPZ1HM680E10O00RAXXX
	100	8×9	40	2,150	1,000	SPZ1HM101F09O00RAXXX
	100	8×11	30	2,300	1,000	SPZ1HM101F11O00RAXXX
	120	8×11	30	2,400	1,200	SPZ1HM121F11O00RAXXX
	150	10×12	30	2,500	1,500	SPZ1HM151G12O00RAXXX
	180	10×12	30	2,600	1,800	SPZ1HM181G12O00RAXXX
	220	10×12	30	2,700	2,200	SPZ1HM221G12O00RAXXX
	270	10×13	20	2,900	2,700	SPZ1HM271G13O00RAXXX
	330	10×15	20	3,000	3,300	SPZ1HM331G15O00RAXXX
	440	10×18	20	3,100	4,400	SPZ1HM441G18O00RAXXX
	470	10×18	20	3,150	4,700	SPZ1HM471G18O00RAXXX
	4.7	6.3×8	60	1,600	500	SPZ1JM4R7E08O00RAXXX
63	6.8	6.3×8	60	1,650	500	SPZ1JM6R8E08O00RAXXX
	33	6.3×8	30	1,700	500	SPZ1JM330E08O00RAXXX
	39	6.3×8	30	1,750	500	SPZ1JM390E08O00RAXXX
	47	6.3×9	30	1,900	592	SPZ1JM470E09O00RAXXX
	56	8×9	30	1,800	706	SPZ1JM560F09O00RAXXX
	68	8×11	30	2,000	857	SPZ1JM680F11O00RAXXX
	82	8×11	30	2,100	1,033	SPZ1JM820F11O00RAXXX
	100	10×12	30	2,200	1,260	SPZ1JM101G12O00RAXXX
	150	10×12	30	2,500	1,890	SPZ1JM151G12O00RAXXX
	180	10×13	20	2,600	2,268	SPZ1JM181G13O00RAXXX
	220	10×15	20	2,650	2,772	SPZ1JM221G15O00RAXXX
	270	10×17	20	2,850	3,402	SPZ1JM271G17O00RAXXX
	330	10×18	20	2,950	4,158	SPZ1JM331G18O00RAXXX
	4.7	6.3×8	60	1,500	500	SPZ1BM4R7E08O00RAXXX
80	6.8	6.3×8	60	1,550	500	SPZ1BM6R8E08O00RAXXX
	22	6.3×10	60	1,650	500	SPZ1BM220E10O00RAXXX
	33	8×11	35	1,700	528	SPZ1BM330F11O00RAXXX
	47	10×12	35	1,850	752	SPZ1BM470G12O00RAXXX

PZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Leakage Current (μA)(max)	Part Number
80	68	10×12	35	1,900	1,088	SPZ1BM680G12O00RAXXX
	100	10×14	35	2,100	1,600	SPZ1BM101G14O00RAXXX
100	4.7	6.3×8	120	1,400	500	SPZ1KM4R7E08O00RAXXX
	6.8	6.3×8	120	1,450	500	SPZ1KM6R8E08O00RAXXX
	10	6.3×10	50	1,500	500	SPZ1KM100E10O00RAXXX
	10	8×11	50	1,550	500	SPZ1KM100F11O00RAXXX
	15	8×11	50	1,550	500	SPZ1KM150F11O00RAXXX
	22	10×12	35	1,600	500	SPZ1KM220G12O00RAXXX
125	33	10×14	35	1,650	660	SPZ1KM330G14O00RAXXX
	47	10×16	35	1,800	940	SPZ1KM470G16O00RAXXX
	33	10×14	35	1,800	825	SPZ2IM330G14O00RAXXX
	47	10×16	35	1,800	1,175	SPZ2IM470G16O00RAXXX

※Specifications subject to change without notice

Conductive Polymer
Radial Type

PT series

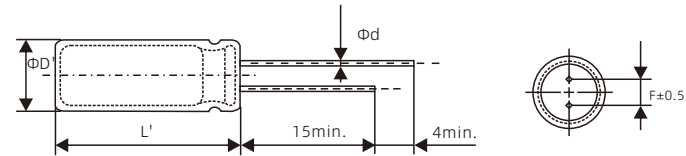
- Endurance: 2,000 hours at 125°C
- Long life, high temperature
- Recommended applications: power supply, service equipment
- RoHS Compliant and lead-free



SPECIFICATIONS

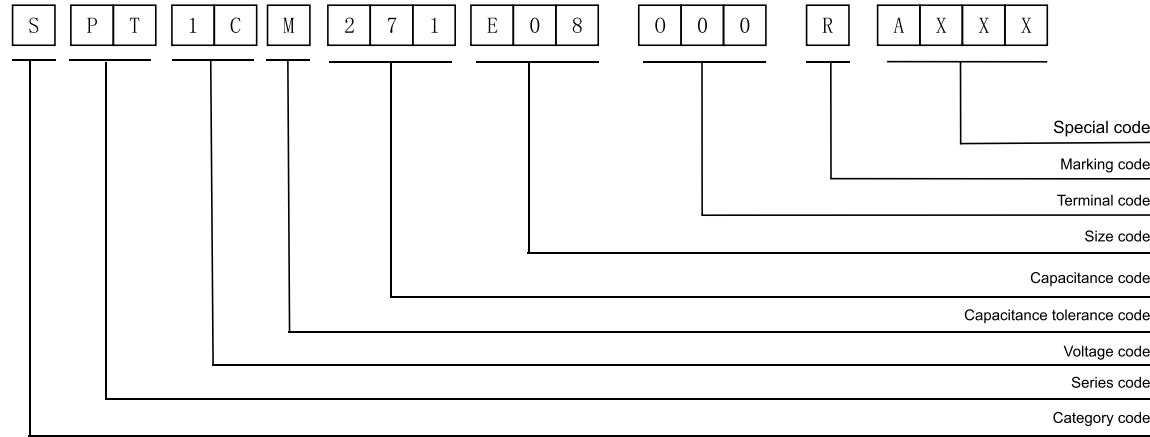
Items	Characteristics										
Category Temperature Range	-55~+125°C										
Rated Working Voltage Range	6.3~25 Vdc										
Nominal Capacitance Range	22~5,600μF										
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)										
DC Leakage Current	I≤0.2CV or 500μA, whichever is greater.										
	Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)										
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	6.8	7	7.5	10	12	16	20	25	(at 20°C,120Hz)
	Dissipation Factor (Max.)	0.08			0.12						
ESR(100kHz,20°C)	Value in the characteristics table										
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+125°C)/Z(+20°C)≤1.5 Z(-55°C)/Z(+20°C)≤2.0										
Endurance	After applying rated voltage for 2,000 hours at 125°C,the capacitors shall meet the following requirements.										
	Appearance	No significant damage									
	Capacitance Change	≤±20% of the initial value									
	Dissipation Factor	≤150% of the initial specified value									
	ESR	≤150% of the initial specified value									
	Leakage Current	≤The initial specified value									
Humidity Test	After subjecting to 90%~95% RH for 1,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.										
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.										
	Appearance	No significant damage									
	Capacitance Change	≤±20% of the initial value									
	Dissipation Factor	≤150% of the initial specified value									
	ESR	≤150% of the initial specified value									
	Leakage Current	≤The initial specified value									

DIMENSIONS [mm]



ΦD	5	5.5	6.3	8	10
Φd	0.5	0.5	0.5	0.6	0.6
F	2	2.5	2.5	3.5	5
ΦD'	ΦD-0.1~+0.5	ΦD-0.3~+0.3	ΦD-0.1~+0.5		
L'	L+1.0max.			L-1~+0.5	

PART NUMBERING SYSTEM



PT series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/125°C,100kHz)	Leakage Current (μA)(max)	Part Number
6.3	220	5×7	30	1,400	500	SPT0JM221D07O00RAXXX
	270	5×7	30	1,500	500	SPT0JM271D07O00RAXXX
	330	5×8	30	1,600	500	SPT0JM331D08O00RAXXX
	330	6.3×8	22	1,600	500	SPT0JM331E08O00RAXXX
	390	5×9	30	1,600	500	SPT0JM391D09O00RAXXX
	470	5×10	30	1,600	592	SPT0JM471D10O00RAXXX
	470	5.5×9	30	1,600	592	SPT0JM471B09O00RAXXX
	470	6.3×8	22	1,700	592	SPT0JM471E08O00RAXXX
	560	6.3×8	30	1,800	706	SPT0JM561E08O00RAXXX
	560	5.5×9	30	1,600	706	SPT0JM561B09O00RAXXX
	680	5.5×9	30	1,800	857	SPT0JM681B09O00RAXXX
	680	6.3×9	30	1,900	857	SPT0JM681E09O00RAXXX
	680	8×9	30	1,900	857	SPT0JM681F09O00RAXXX
	820	6.3×9	30	1,900	1,033	SPT0JM821E09O00RAXXX
	1,000	6.3×10	15	1,900	1,260	SPT0JM102E10O00RAXXX
	1,000	8×9	18	1,900	1,260	SPT0JM102F09O00RAXXX
	1,000	8×11	15	1,900	1,260	SPT0JM102F11O00RAXXX
	1,200	8×11	15	1,900	1,512	SPT0JM122F11O00RAXXX
	1,500	8×11	15	2,000	1,890	SPT0JM152F11O00RAXXX
	1,500	10×12	15	2,000	1,890	SPT0JM152G12O00RAXXX
	1,800	10×10	15	2,000	2,268	SPT0JM182G10O00RAXXX
	2,200	8×14	15	2,100	2,772	SPT0JM222F14O00RAXXX
	2,200	10×12	15	2,100	2,772	SPT0JM222G12O00RAXXX
	3,300	10×14	15	2,100	4,158	SPT0JM332G14O00RAXXX
	4,700	10×17	15	2,200	5,000	SPT0JM472G17O00RAXXX
	5,600	10×18	15	2,200	5,000	SPT0JM562G18O00RAXXX
6.8	220	5×7	28	1,300	500	SPT0CM221D07O00RAXXX
	270	5×7	28	1,400	500	SPT0CM271D07O00RAXXX
	330	5×8	28	1,500	500	SPT0CM331D08O00RAXXX
	330	6.3×5	35	1,300	500	SPT0CM331E05O00RAXXX
	470	5×9	28	1,600	639	SPT0CM471D09O00RAXXX
	470	6.3×7	28	1,500	639	SPT0CM471E07O00RAXXX
	560	6.3×8	28	1,700	762	SPT0CM561E08O00RAXXX
	680	6.3×9	28	1,800	925	SPT0CM681E09O00RAXXX
	820	6.3×9	28	1,800	1,115	SPT0CM821E09O00RAXXX
	1,000	6.3×11	17	1,900	1,360	SPT0CM102E11O00RAXXX
7	1,000	8×11	14	1,900	1,360	SPT0CM102F11O00RAXXX
	220	5×7	28	1,300	500	SPT0QM221D07O00RAXXX
	270	5×8	28	1,400	500	SPT0QM271D08O00RAXXX
	330	5×9	28	1,400	500	SPT0QM331D09O00RAXXX
	470	5.5×9	28	1,400	658	SPT0QM471B09O00RAXXX
	470	6.3×7	28	1,500	658	SPT0QM471E07O00RAXXX
	560	6.3×8	28	1,600	784	SPT0QM561E08O00RAXXX
	680	6.3×9	17	1,600	952	SPT0QM681E09O00RAXXX

Conductive Polymer
Radial Type

PT series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/125°C,100kHz)	Leakage Current (μA)(max)	Part Number
7	820	6.3×10	17	1,700	1,148	SPT0QM821E10O00RAXXX
	820	8×9	17	1,700	1,148	SPT0QM821F09O00RAXXX
7.5	220	5×7	28	1,300	500	SPT0AM221D07O00RAXXX
	270	5×7	28	1,300	500	SPT0AM271D07O00RAXXX
	330	5×9	28	1,400	500	SPT0AM331D09O00RAXXX
	390	5×9	28	1,400	585	SPT0AM391D09O00RAXXX
	470	5.5×9	28	1,400	705	SPT0AM471B09O00RAXXX
	470	6.3×7	35	1,300	705	SPT0AM471E07O00RAXXX
	500	5.5×9	28	1,400	750	SPT0AM501B09O00RAXXX
	560	6.3×8	28	1,500	840	SPT0AM561E08O00RAXXX
	680	6.3×9	17	1,600	1,020	SPT0AM681E09O00RAXXX
	820	6.3×10	17	1,700	1,230	SPT0AM821E10O00RAXXX
	820	8×9	17	1,700	1,230	SPT0AM821F09O00RAXXX
	1,200	8×11	17	1,840	1,800	SPT0AM122F11O00RAXXX
10	47	5×7	52	1,000	500	SPT1AM470D07O00RAXXX
	56	5×7	52	1,000	500	SPT1AM560D07O00RAXXX
	68	5×7	52	1,000	500	SPT1AM680D07O00RAXXX
	82	5×7	52	1,100	500	SPT1AM820D07O00RAXXX
	100	5×7	52	1,100	500	SPT1AM101D07O00RAXXX
	120	5×7	30	1,100	500	SPT1AM121D07O00RAXXX
	150	5×7	30	1,100	500	SPT1AM151D07O00RAXXX
	180	5×8	30	1,200	500	SPT1AM181D08O00RAXXX
	220	5×9	30	1,200	500	SPT1AM221D09O00RAXXX
	220	6.3×8	30	1,300	500	SPT1AM221E08O00RAXXX
	270	6.3×8	30	1,300	540	SPT1AM271E08O00RAXXX
	330	6.3×8	30	1,300	660	SPT1AM331E08O00RAXXX
	330	8×9	22	1,400	660	SPT1AM331F09O00RAXXX
	390	6.3×8	30	1,400	780	SPT1AM391E08O00RAXXX
	470	5.5×9	30	1,400	940	SPT1AM471B09O00RAXXX
	470	6.3×8	30	1,400	940	SPT1AM471E08O00RAXXX
	470	8×9	22	1,400	940	SPT1AM471F09O00RAXXX
	560	6.3×10	18	1,600	1,020	SPT1AM561E10O00RAXXX
	560	8×9	22	1,400	1,020	SPT1AM561F09O00RAXXX
	680	8×11	18	1,500	1,360	SPT1AM681F11O00RAXXX
	820	8×11	18	1,600	1,640	SPT1AM821F11O00RAXXX
	1,000	8×11	18	1,600	2,000	SPT1AM102F11O00RAXXX
	1,000	10×12	15	1,900	2,000	SPT1AM102G12O00RAXXX
	1,200	8×12	15	1,700	2,400	SPT1AM122F12O00RAXXX
	1,200	10×12	15	2,000	2,400	SPT1AM122G12O00RAXXX
	1,500	10×12	15	2,000	3,000	SPT1AM152G12O00RAXXX
	1,800	10×13	15	2,100	3,600	SPT1AM182G13O00RAXXX
	2,200	10×15	15	2,200	4,400	SPT1AM222G15O00RAXXX
	3,300	10×18	15	2,200	5,000	SPT1AM332G18O00RAXXX
12	330	5.5×9	28	1,300	792	SPT1TM331B09O00RAXXX

PT series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/125°C,100kHz)	Leakage Current (μA)(max)	Part Number
12	470	5.5×9	28	1,300	1,128	SPT1TM471B09O00RAXXX
	470	6.3×9	28	1,400	1,128	SPT1TM471E09O00RAXXX
	560	6.3×10	21	1,400	1,334	SPT1TM561E10O00RAXXX
	680	6.3×11	21	1,500	1,632	SPT1TM681E11O00RAXXX
	820	8×11	17	1,500	1,968	SPT1TM821F11O00RAXXX
	1,000	8×12	17	1,600	2,400	SPT1TM102F12O00RAXXX
	1,200	8×14	17	1,700	2,880	SPT1TM122F14O00RAXXX
	1,500	8×16	17	1,800	3,600	SPT1TM152F16O00RAXXX
16	47	5×7	30	1,000	500	SPT1CM470D07O00RAXXX
	56	5×7	30	1,000	500	SPT1CM560D07O00RAXXX
	68	5×7	30	1,000	500	SPT1CM680D07O00RAXXX
	82	5×8	30	1,000	500	SPT1CM820D08O00RAXXX
	100	5×7	30	1,000	500	SPT1CM101D07O00RAXXX
	100	6.3×5	37	1,000	500	SPT1CM101E05O00RAXXX
	100	6.3×8	30	1,200	500	SPT1CM101E08O00RAXXX
	120	5×8	30	1,100	500	SPT1CM121D08O00RAXXX
	150	5×8	30	1,100	500	SPT1CM151D08O00RAXXX
	180	5×8	30	1,100	576	SPT1CM181D08O00RAXXX
	180	6.3×7	30	1,100	576	SPT1CM181E07O00RAXXX
	220	5×10	30	1,100	704	SPT1CM221D10O00RAXXX
	220	6.3×8	30	1,200	704	SPT1CM221E08O00RAXXX
	220	6.3×10	22	1,200	704	SPT1CM221E10O00RAXXX
	270	5.5×9	30	1,200	864	SPT1CM271B09O00RAXXX
	270	6.3×8	30	1,200	864	SPT1CM271E08O00RAXXX
	270	8×9	30	1,200	864	SPT1CM271F09O00RAXXX
	330	5.5×9	30	1,200	1,056	SPT1CM331B09O00RAXXX
	330	6.3×9	30	1,200	1,056	SPT1CM331E09O00RAXXX
	470	6.3×11	22	1,300	1,504	SPT1CM471E11O00RAXXX
	470	8×11	22	1,700	1,504	SPT1CM471F11O00RAXXX
	560	8×11	22	1,300	1,792	SPT1CM561F11O00RAXXX
	560	8×13	22	1,300	1,792	SPT1CM561F13O00RAXXX
	560	10×12	18	1,400	1,792	SPT1CM561G12O00RAXXX
	680	8×11	22	1,400	2,176	SPT1CM681F11O00RAXXX
	680	10×12	18	1,400	2,176	SPT1CM681G12O00RAXXX
	820	8×13	16	1,400	2,624	SPT1CM821F13O00RAXXX
	820	10×12	18	1,500	2,624	SPT1CM821G12O00RAXXX
	1,000	8×14	18	1,600	3,200	SPT1CM102F14O00RAXXX
	1,000	10×12	18	1,600	3,200	SPT1CM102G12O00RAXXX
	1,500	10×18	18	2,000	4,800	SPT1CM152G18O00RAXXX
	1,800	10×14	18	2,000	5,000	SPT1CM182G14O00RAXXX
	2,200	10×18	18	2,100	5,000	SPT1CM222G18O00RAXXX
20	82	6.3×8	42	1,690	500	SPT1DM820E08O00RAXXX
	120	6.3×8	42	1,100	500	SPT1DM121E08O00RAXXX
	150	6.3×10	28	1,100	600	SPT1DM151E10O00RAXXX

Conductive Polymer
Radial Type

PT series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/125°C,100kHz)	Leakage Current (μA)(max)	Part Number
20	220	8×11	28	1,100	880	SPT1DM221F11O00RAXXX
	270	8×11	28	1,200	1,080	SPT1DM271F11O00RAXXX
	470	8×11	28	1,100	1,880	SPT1DM471F11O00RAXXX
	470	10×12	28	1,200	1,880	SPT1DM471G12O00RAXXX
	560	10×12	28	1,300	2,240	SPT1DM561G12O00RAXXX
	680	10×15	28	1,300	2,720	SPT1DM681G15O00RAXXX
	820	10×18	28	1,400	3,280	SPT1DM821G18O00RAXXX
25	1,000	10×18	28	1,500	4,000	SPT1DM102G18O00RAXXX
	22	5×9	90	900	500	SPT1EM220D09O00RAXXX
	33	5×9	90	900	500	SPT1EM330D09O00RAXXX
	39	5×8	90	900	500	SPT1EM390D08O00RAXXX
	47	5×9	90	900	500	SPT1EM470D09O00RAXXX
	56	5×9	90	1,000	500	SPT1EM560D09O00RAXXX
	68	6.3×7	45	1,100	500	SPT1EM680E07O00RAXXX
	82	6.3×7	45	1,100	500	SPT1EM820E07O00RAXXX
	100	6.3×8	45	1,100	500	SPT1EM101E08O00RAXXX
	100	6.3×10	30	1,200	500	SPT1EM101E10O00RAXXX
	100	8×11	30	1,300	500	SPT1EM101F11O00RAXXX
	120	6.3×8	45	1,100	600	SPT1EM121E08O00RAXXX
	150	6.3×10	30	1,200	750	SPT1EM151E10O00RAXXX
	180	6.3×10	30	1,200	900	SPT1EM181E10O00RAXXX
	180	8×9	45	1,100	900	SPT1EM181F09O00RAXXX
	220	8×11	30	1,300	1,100	SPT1EM221F11O00RAXXX
	220	10×12	30	1,400	1,100	SPT1EM221G12O00RAXXX
	270	8×11	30	1,300	1,350	SPT1EM271F11O00RAXXX
	330	8×11	30	1,300	1,650	SPT1EM331F11O00RAXXX
	330	10×10	37	1,200	1,650	SPT1EM331G10O00RAXXX
	330	10×12	30	1,500	1,650	SPT1EM331G12O00RAXXX
	470	8×16	30	1,400	2,350	SPT1EM471F16O00RAXXX
	470	10×12	30	1,600	2,350	SPT1EM471G12O00RAXXX
	560	10×12	30	1,600	2,800	SPT1EM561G12O00RAXXX
	680	10×12	30	1,600	3,400	SPT1EM681G12O00RAXXX
	680	10×15	30	1,600	3,400	SPT1EM681G15O00RAXXX
	820	10×18	30	1,600	4,100	SPT1EM821G18O00RAXXX
	1,000	10×18	30	1,700	5,000	SPT1EM102G18O00RAXXX

※Specifications subject to change without notice

PF series

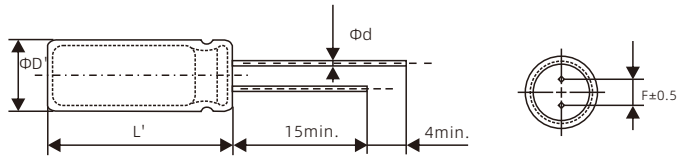
- Endurance: 3,000~5,000 hours at 105°C
- Long life
- Recommended applications: system board, display card, small changer and intelligent TV
- RoHS Compliant and lead-free



SPECIFICATIONS

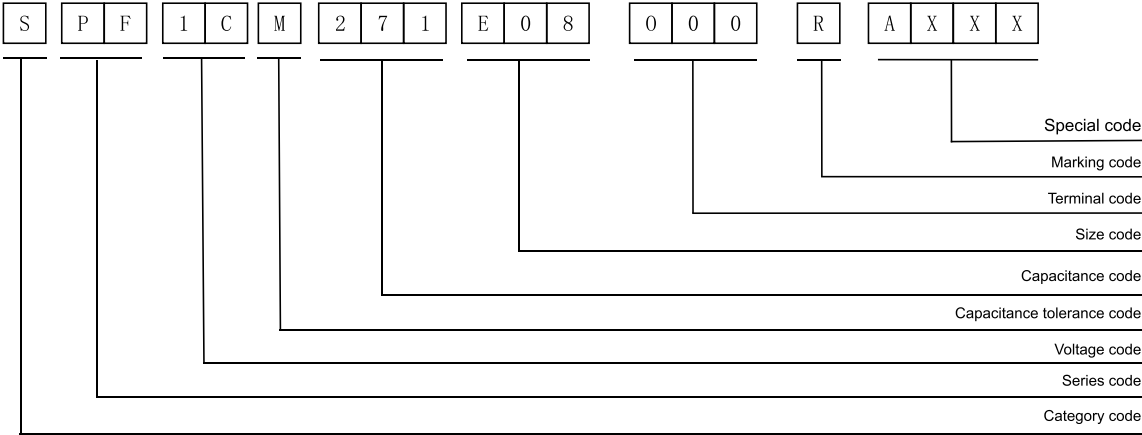
Items	Characteristics																
Category Temperature Range	-55~+105°C																
Rated Working Voltage Range	6.3~125 Vdc																
Nominal Capacitance Range	4.7~5,600μF																
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)																
DC Leakage Current	I≤0.2CV or 500μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)																
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	6.8	7	7.5	10	12	16	20	25	35	50	63	80	100	125	(at 20°C,120Hz)
	Dissipation Factor (Max.)	0.08				0.12								0.15			
ESR(100kHz,20°C)	Value in the characteristics table																
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+105°C)/Z(+20°C)≤1.5 Z(-55°C)/Z(+20°C)≤2.0																
Endurance	After applying rated voltage for 3,000~5,000 hours at 105°C,the capacitors shall meet the following requirements.																
	Appearance	No significant damage															
	Capacitance Change	≤±20% of the initial value															
	Dissipation Factor	≤150% of the initial specified value															
	ESR	≤150% of the initial specified value															
	Leakage Current	≤The initial specified value															
Humidity Test	After subjecting to 90%~95% RH for 1,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.																
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.																
	Appearance	No significant damage															
	Capacitance Change	≤±20% of the initial value															
	Dissipation Factor	≤150% of the initial specified value															
	ESR	≤150% of the initial specified value															
	Leakage Current	≤The initial specified value															

DIMENSIONS [mm]



ΦD	5	5.5	6.3	8	10
Φd	0.5	0.5	0.5	0.6	0.6
F	2	2.5	2.5	3.5	5
ΦD'	ΦD-0.1~+0.5	ΦD-0.3~+0.3	ΦD-0.1~+0.5		
L'	L+1.0max.			L-1~+0.5	

PART NUMBERING SYSTEM



Conductive Polymer
Radial Type

PF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
6.3	220	5×7	22	3,100	500	SPF0JM221D07O00RAXXX
	270	5×7	22	3,400	500	SPF0JM271D07O00RAXXX
	330	5×8	22	3,600	500	SPF0JM331D08O00RAXXX
	330	6.3×5	27	2,800	500	SPF0JM331E05O00RAXXX
	330	6.3×8	16	3,600	500	SPF0JM331E08O00RAXXX
	390	5×9	22	3,600	500	SPF0JM391D09O00RAXXX
	470	5×10	22	3,800	592	SPF0JM471D10O00RAXXX
	470	5.5×9	22	3,600	592	SPF0JM471B09O00RAXXX
	470	6.3×8	16	3,900	592	SPF0JM471E08O00RAXXX
	560	5.5×9	22	3,800	706	SPF0JM561B09O00RAXXX
	560	6.3×8	22	4,300	706	SPF0JM561E08O00RAXXX
	680	5.5×9	22	4,300	857	SPF0JM681B09O00RAXXX
	680	6.3×9	22	4,500	857	SPF0JM681E09O00RAXXX
	680	8×9	22	4,100	857	SPF0JM681F09O00RAXXX
	820	6.3×9	22	4,500	1,033	SPF0JM821E09O00RAXXX
	1,000	6.3×10	11	4,800	1,260	SPF0JM102E10O00RAXXX
	1,000	8×9	13	4,600	1,260	SPF0JM102F09O00RAXXX
	1,000	8×11	11	4,800	1,260	SPF0JM102F11O00RAXXX
	1,200	8×11	11	4,800	1,512	SPF0JM122F11O00RAXXX
	1,500	8×11	11	4,800	1,890	SPF0JM152F11O00RAXXX
	1,500	10×12	11	4,900	1,890	SPF0JM152G12O00RAXXX
	1,800	10×10	11	5,000	2,268	SPF0JM182G10O00RAXXX
	2,200	8×14	11	5,100	2,772	SPF0JM222F14O00RAXXX
	2,200	10×12	11	5,200	2,772	SPF0JM222G12O00RAXXX
	3,300	10×14	11	5,300	4,158	SPF0JM332G14O00RAXXX
	4,700	10×17	11	5,400	5,000	SPF0JM472G17O00RAXXX
	5,600	10×18	11	5,600	5,000	SPF0JM562G18O00RAXXX
6.8	220	5×7	22	2,900	500	SPF0CM221D07O00RAXXX
	270	5×7	22	3,200	500	SPF0CM271D07O00RAXXX
	330	5×8	22	3,400	500	SPF0CM331D08O00RAXXX
	390	5×9	22	3,500	530	SPF0CM391D09O00RAXXX
	470	5×9	22	3,600	639	SPF0CM471D09O00RAXXX
	470	6.3×7	22	3,800	639	SPF0CM471E07O00RAXXX
	560	6.3×8	22	4,000	762	SPF0CM561E08O00RAXXX
	680	6.3×9	22	4,300	925	SPF0CM681E09O00RAXXX
	820	6.3×9	22	4,400	1,115	SPF0CM821E09O00RAXXX
	1,000	6.3×11	13	4,600	1,360	SPF0CM102E11O00RAXXX
	1,000	8×11	11	4,600	1,360	SPF0CM102F11O00RAXXX
7	220	5×7	22	2,800	500	SPF0QM221D07O00RAXXX
	270	5×8	22	3,000	500	SPF0QM271D08O00RAXXX
	330	5×9	22	3,200	500	SPF0QM331D09O00RAXXX
	470	5.5×9	22	3,200	658	SPF0QM471B09O00RAXXX
	470	6.3×8	22	3,400	658	SPF0QM471E08O00RAXXX
	560	6.3×8	22	3,600	784	SPF0QM561E08O00RAXXX

PF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
7	680	6.3×9	13	3,700	952	SPF0QM681E09O00RAXXX
	820	6.3×10	13	4,000	1,148	SPF0QM821E10O00RAXXX
	820	8×9	13	4,100	1,148	SPF0QM821F09O00RAXXX
7.5	220	5×7	22	2,700	500	SPF0AM221D07O00RAXXX
	270	5×8	22	2,900	500	SPF0AM271D08O00RAXXX
	330	5×9	22	3,100	500	SPF0AM331D09O00RAXXX
	470	5.5×9	22	3,100	705	SPF0AM471B09O00RAXXX
	470	6.3×7	28	2,800	705	SPF0AM471E07O00RAXXX
	500	5.5×9	22	3,200	750	SPF0AM501B09O00RAXXX
	560	6.3×8	22	3,500	840	SPF0AM561E08O00RAXXX
	680	6.3×9	13	3,600	1,020	SPF0AM681E09O00RAXXX
	820	6.3×10	13	3,900	1,230	SPF0AM821E10O00RAXXX
	820	8×9	13	4,000	1,230	SPF0AM821F09O00RAXXX
	1,200	8×11	13	4,300	1,800	SPF0AM122F11O00RAXXX
	47	5×7	38	1,900	500	SPF1AM470D07O00RAXXX
	56	5×7	38	2,000	500	SPF1AM560D07O00RAXXX
	68	5×7	38	2,000	500	SPF1AM680D07O00RAXXX
10	82	5×7	38	2,100	500	SPF1AM820D07O00RAXXX
	100	5×7	38	2,100	500	SPF1AM101D07O00RAXXX
	120	5×7	22	2,200	500	SPF1AM121D07O00RAXXX
	150	5×7	22	2,200	500	SPF1AM151D07O00RAXXX
	220	5×9	22	2,500	500	SPF1AM221D09O00RAXXX
	220	6.3×8	16	2,800	500	SPF1AM221E08O00RAXXX
	270	6.3×8	22	2,700	540	SPF1AM271E08O00RAXXX
	330	6.3×8	22	2,900	660	SPF1AM331E08O00RAXXX
	330	8×9	16	3,000	660	SPF1AM331F09O00RAXXX
	390	6.3×8	22	3,000	780	SPF1AM391E08O00RAXXX
	470	5.5×9	22	3,000	940	SPF1AM471B09O00RAXXX
	470	6.3×8	22	3,100	940	SPF1AM471E08O00RAXXX
	470	8×9	16	3,100	940	SPF1AM471F09O00RAXXX
	560	6.3×10	14	3,200	1,120	SPF1AM561E10O00RAXXX
	560	8×9	16	3,200	1,120	SPF1AM561F09O00RAXXX
	680	8×11	13	3,500	1,360	SPF1AM681F11O00RAXXX
	820	8×11	13	3,600	1,640	SPF1AM821F11O00RAXXX
	1,000	8×11	13	3,700	2,000	SPF1AM102F11O00RAXXX
	1,000	10×12	11	4,700	2,000	SPF1AM102G12O00RAXXX
	1,200	8×12	11	4,000	2,400	SPF1AM122F12O00RAXXX
	1,200	10×12	11	4,900	2,400	SPF1AM122G12O00RAXXX
	1,500	10×12	11	4,900	3,000	SPF1AM152G12O00RAXXX
	1,800	10×13	11	5,200	3,600	SPF1AM182G13O00RAXXX
	2,200	10×15	11	5,400	4,400	SPF1AM222G15O00RAXXX
	3,300	10×18	11	5,500	5,000	SPF1AM332G18O00RAXXX
12	330	5.5×9	22	2,700	792	SPF1TM331B09O00RAXXX
	470	5.5×9	22	2,800	1,128	SPF1TM471B09O00RAXXX

Conductive Polymer
Radial Type

PF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
12	470	6.3×9	22	3,100	1,128	SPF1TM471E09O00RAXXX
	680	6.3×11	17	3,200	1,632	SPF1TM681E11O00RAXXX
	820	8×11	13	3,400	1,968	SPF1TM821F11O00RAXXX
	1,000	8×12	13	3,600	2,400	SPF1TM102F12O00RAXXX
	1,200	8×14	13	3,900	2,880	SPF1TM122F14O00RAXXX
	1,500	8×16	13	4,300	3,600	SPF1TM152F16O00RAXXX
16	47	5×7	22	1,800	500	SPF1CM470D07O00RAXXX
	56	5×7	22	1,800	500	SPF1CM560D07O00RAXXX
	68	5×7	22	1,900	500	SPF1CM680D07O00RAXXX
	82	5×8	22	1,900	500	SPF1CM820D08O00RAXXX
	100	5×7	22	2,000	500	SPF1CM101D07O00RAXXX
	100	6.3×5	27	1,800	500	SPF1CM101E05O00RAXXX
	120	5×8	22	2,100	500	SPF1CM121D08O00RAXXX
	150	5×8	22	2,100	500	SPF1CM151D08O00RAXXX
	180	5×8	22	2,200	576	SPF1CM181D08O00RAXXX
	180	6.3×7	17	2,200	576	SPF1CM181E07O00RAXXX
	220	5×10	22	2,300	704	SPF1CM221D10O00RAXXX
	220	6.3×8	22	2,400	704	SPF1CM221E08O00RAXXX
	220	6.3×10	16	2,600	704	SPF1CM221E10O00RAXXX
	270	5.5×9	22	2,400	864	SPF1CM271B09O00RAXXX
	270	6.3×8	22	2,500	864	SPF1CM271E08O00RAXXX
	270	8×9	22	2,600	864	SPF1CM271F09O00RAXXX
	330	5.5×9	22	2,600	1,056	SPF1CM331B09O00RAXXX
	330	6.3×9	22	2,600	1,056	SPF1CM331E09O00RAXXX
	470	6.3×11	16	2,800	1,504	SPF1CM471E11O00RAXXX
	470	8×11	16	3,100	1,504	SPF1CM471F11O00RAXXX
	560	8×11	16	2,800	1,792	SPF1CM561F11O00RAXXX
	560	8×13	16	2,800	1,792	SPF1CM561F13O00RAXXX
	680	8×11	16	3,000	2,176	SPF1CM681F11O00RAXXX
	680	10×12	13	3,200	2,176	SPF1CM681G12O00RAXXX
	820	8×13	12	3,100	2,624	SPF1CM821F13O00RAXXX
	820	10×12	13	3,400	2,624	SPF1CM821G12O00RAXXX
	1,000	8×14	13	3,200	3,200	SPF1CM102F14O00RAXXX
	1,000	10×12	13	3,600	3,200	SPF1CM102G12O00RAXXX
	1,200	10×12	13	3,700	3,840	SPF1CM122G12O00RAXXX
	1,200	10×15	13	3,800	3,840	SPF1CM122G15O00RAXXX
	1,500	10×18	13	4,900	4,800	SPF1CM152G18O00RAXXX
	1,800	10×14	13	4,800	5,000	SPF1CM182G14O00RAXXX
	2,200	10×15	13	4,900	5,000	SPF1CM222G15O00RAXXX
	2,200	10×17	13	5,200	5,000	SPF1CM222G17O00RAXXX
20	33	5×8	44	1,700	500	SPF1DM330D08O00RAXXX
	39	5×8	44	1,700	500	SPF1DM390D08O00RAXXX
	47	5×8	44	1,900	500	SPF1DM470D08O00RAXXX
	56	5×9	44	1,900	500	SPF1DM560D09O00RAXXX

PF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
20	68	6.3×8	33	1,900	500	SPF1DM680E08O00RAXXX
	82	6.3×8	33	1,900	500	SPF1DM820E08O00RAXXX
	100	6.3×8	33	1,900	500	SPF1DM101E08O00RAXXX
	120	6.3×8	33	2,000	500	SPF1DM121E08O00RAXXX
	150	6.3×10	22	2,100	600	SPF1DM151E10O00RAXXX
	220	8×9	33	2,200	880	SPF1DM221F09O00RAXXX
	220	8×11	22	2,200	880	SPF1DM221F11O00RAXXX
	270	8×11	22	2,400	1,080	SPF1DM271F11O00RAXXX
	330	8×11	22	2,500	1,320	SPF1DM331F11O00RAXXX
	470	10×12	22	2,600	1,880	SPF1DM471G12O00RAXXX
	680	10×12	22	2,700	2,720	SPF1DM681G12O00RAXXX
	680	10×15	22	2,900	2,720	SPF1DM681G15O00RAXXX
25	820	10×18	22	3,000	3,280	SPF1DM821G18O00RAXXX
	1,000	10×18	22	3,500	4,000	SPF1DM102G18O00RAXXX
	33	5×9	66	1,600	500	SPF1EM330D09O00RAXXX
	39	5×8	66	1,700	500	SPF1EM390D08O00RAXXX
	47	5×9	66	1,700	500	SPF1EM470D09O00RAXXX
	56	5×9	66	1,800	500	SPF1EM560D09O00RAXXX
	82	6.3×7	33	2,200	500	SPF1EM820E07O00RAXXX
	100	6.3×8	33	2,200	500	SPF1EM101E08O00RAXXX
	100	8×11	22	2,700	500	SPF1EM101F11O00RAXXX
	120	6.3×8	33	2,200	600	SPF1EM121E08O00RAXXX
	150	6.3×10	22	2,500	750	SPF1EM151E10O00RAXXX
	180	8×9	33	2,200	900	SPF1EM181F09O00RAXXX
	220	8×11	22	2,700	1,100	SPF1EM221F11O00RAXXX
	270	8×11	22	2,700	1,350	SPF1EM271F11O00RAXXX
	330	8×11	22	2,700	1,650	SPF1EM331F11O00RAXXX
	330	10×12	22	3,000	1,650	SPF1EM331G12O00RAXXX
	470	8×11	22	2,700	2,350	SPF1EM471F11O00RAXXX
	470	10×12	22	3,600	2,350	SPF1EM471G12O00RAXXX
	680	10×15	22	3,800	3,400	SPF1EM681G15O00RAXXX
	820	8×16	22	3,200	4,100	SPF1EM821F16O00RAXXX
	820	10×18	22	4,000	4,100	SPF1EM821G18O00RAXXX
	1,000	10×18	22	4,000	5,000	SPF1EM102G18O00RAXXX
35	4.7	5×8	66	1,500	500	SPF1VM4R7D08O00RAXXX
	10	5×8	66	1,600	500	SPF1VM100D08O00RAXXX
	15	5×8	66	1,600	500	SPF1VM150D08O00RAXXX
	22	5×9	110	1,700	500	SPF1VM220D09O00RAXXX
	33	5×9	55	1,800	500	SPF1VM330D09O00RAXXX
	39	5×9	55	1,800	500	SPF1VM390D09O00RAXXX
	47	6.3×7	55	1,800	500	SPF1VM470E07O00RAXXX
	56	6.3×7	55	1,900	500	SPF1VM560E07O00RAXXX
	68	6.3×7	55	1,900	500	SPF1VM680E07O00RAXXX
	82	6.3×7	55	2,000	574	SPF1VM820E07O00RAXXX

Conductive Polymer
Radial Type

PF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
35	100	6.3×8	55	2,100	700	SPF1VM101E08O00RAXXX
	100	8×11	44	2,300	700	SPF1VM101F11O00RAXXX
	120	6.3×10	44	2,200	840	SPF1VM121E10O00RAXXX
	150	6.3×10	44	2,200	1,050	SPF1VM151E10O00RAXXX
	220	8×11	44	2,500	1,540	SPF1VM221F11O00RAXXX
	220	10×12	33	2,600	1,540	SPF1VM221G12O00RAXXX
	270	10×12	33	2,700	1,890	SPF1VM271G12O00RAXXX
	330	10×12	33	2,700	2,310	SPF1VM331G12O00RAXXX
	470	10×13	22	2,800	3,290	SPF1VM471G13O00RAXXX
	680	10×16	22	3,000	4,760	SPF1VM681G16O00RAXXX
50	820	10×18	22	3,100	5,000	SPF1VM821G18O00RAXXX
	1,000	10×18	22	3,300	5,000	SPF1VM102G18O00RAXXX
	4.7	5×8	66	1,300	500	SPF1HM4R7D08O00RAXXX
	10	5×8	77	1,400	500	SPF1HM100D08O00RAXXX
	10	6.3×7	38	1,600	500	SPF1HM100E07O00RAXXX
	15	5×8	77	1,400	500	SPF1HM150D08O00RAXXX
	22	6.3×7	44	1,700	500	SPF1HM220E07O00RAXXX
	33	6.3×7	44	1,800	500	SPF1HM330E07O00RAXXX
	47	6.3×8	38	1,800	500	SPF1HM470E08O00RAXXX
	56	6.3×8	38	1,900	560	SPF1HM560E08O00RAXXX
	68	6.3×10	33	1,900	680	SPF1HM680E10O00RAXXX
	100	8×11	33	2,000	1,000	SPF1HM101F11O00RAXXX
	120	8×11	33	2,100	1,200	SPF1HM121F11O00RAXXX
	150	10×12	33	2,200	1,500	SPF1HM151G12O00RAXXX
	220	10×12	33	2,400	2,200	SPF1HM221G12O00RAXXX
	270	10×13	22	2,600	2,700	SPF1HM271G13O00RAXXX
	330	10×15	22	2,700	3,300	SPF1HM331G15O00RAXXX
	440	10×18	22	2,700	4,400	SPF1HM441G18O00RAXXX
63	470	10×18	22	2,800	4,700	SPF1HM471G18O00RAXXX
	4.7	6.3×8	66	1,400	500	SPF1JM4R7E08O00RAXXX
	6.8	6.3×8	66	1,400	500	SPF1JM6R8E08O00RAXXX
	10	6.3×8	66	1,400	500	SPF1JM100E08O00RAXXX
	33	6.3×8	33	1,500	500	SPF1JM330E08O00RAXXX
	39	6.3×8	33	1,500	500	SPF1JM390E08O00RAXXX
	47	6.3×9	33	1,700	592	SPF1JM470E09O00RAXXX
	56	8×9	33	1,600	706	SPF1JM560F09O00RAXXX
	68	8×11	33	1,800	857	SPF1JM680F11O00RAXXX
	82	8×11	33	1,800	1,033	SPF1JM820F11O00RAXXX
	100	10×12	33	1,900	1,260	SPF1JM101G12O00RAXXX
	150	10×12	33	2,200	1,890	SPF1JM151G12O00RAXXX
	220	10×15	22	2,300	2,772	SPF1JM221G15O00RAXXX
	270	10×17	22	2,500	3,402	SPF1JM271G17O00RAXXX
80	330	10×18	22	2,600	4,158	SPF1JM331G18O00RAXXX
	4.7	6.3×8	66	1,300	500	SPF1BM4R7E08O00RAXXX

PF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
80	6.8	6.3×8	66	1,300	500	SPF1BM6R8E08O00RAXXX
	22	6.3×10	66	1,400	500	SPF1BM220E10O00RAXXX
	33	8×11	38	1,500	528	SPF1BM330F11O00RAXXX
	47	10×12	38	1,600	752	SPF1BM470G12O00RAXXX
	68	10×12	38	1,700	1,088	SPF1BM680G12O00RAXXX
	100	10×14	38	1,800	1,600	SPF1BM101G14O00RAXXX
100	4.7	6.3×8	132	1,200	500	SPF1KM4R7E08O00RAXXX
	6.8	6.3×8	132	1,300	500	SPF1KM6R8E08O00RAXXX
	10	6.3×10	55	1,300	500	SPF1KM100E10O00RAXXX
	10	8×11	55	1,300	500	SPF1KM100F11O00RAXXX
	15	8×11	55	1,300	500	SPF1KM150F11O00RAXXX
	22	10×12	38	1,400	500	SPF1KM220G12O00RAXXX
	33	10×14	38	1,400	660	SPF1KM330G14O00RAXXX
	47	10×16	38	1,600	940	SPF1KM470G16O00RAXXX
125	33	10×14	38	1,400	825	SPF2IM330G14O00RAXXX
	47	10×16	38	1,400	1,175	SPF2IM470G16O00RAXXX

※ Specifications subject to change without notice

Conductive Polymer
Radial Type

PU series

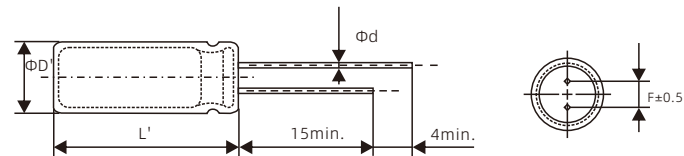
- Endurance: 2,000 hours at 105°C
- Low ESR
- Recommended applications : main board, display card
- **RoHS Compliant and lead-free**



SPECIFICATIONS

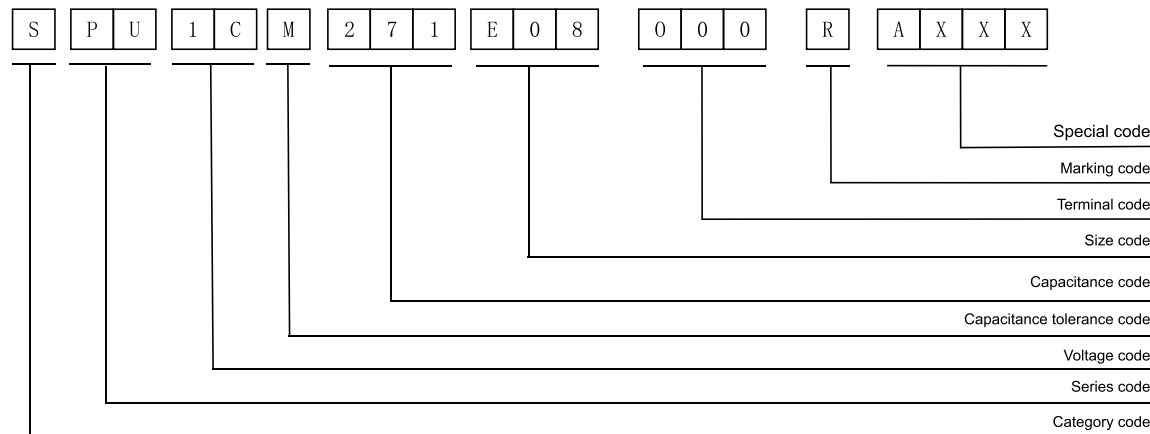
Items	Characteristics										
Category Temperature Range	-55~+105°C										
Rated Working Voltage Range	6.3~25 Vdc										
Nominal Capacitance Range	39~ 5,600μF										
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)										
DC Leakage Current	I≤0.2CV or 500μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)										
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	6.8	7	7.5	10	12	16	20	25	(at 20°C,120Hz)
	Dissipation Factor (Max.)	0.08			0.12						
ESR(100kHz,20°C)	Value in the characteristics table										
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+105°C)/Z(+20°C)≤1.5 Z(-55°C)/Z(+20°C)≤2.0										
Endurance	After applying rated voltage for 2,000 hours at 105°C,the capacitors shall meet the following requirements.										
	Appearance	No significant damage									
	Capacitance Change	≤±20% of the initial value									
	Dissipation Factor	≤150% of the initial specified value									
	ESR	≤150% of the initial specified value									
Leakage Current	≤The initial specified value										
Humidity Test	After subjecting to 90%~95% RH for 1,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.										
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.										
	Appearance	No significant damage									
	Capacitance Change	≤±20% of the initial value									
	Dissipation Factor	≤150% of the initial specified value									
	ESR	≤150% of the initial specified value									
Leakage Current	≤The initial specified value										

■ **DIMENSIONS [mm]**



ΦD	5	5.5	6.3	8	10
Φd	0.5	0.5	0.5	0.6	0.6
F	2	2.5	2.5	3.5	5
$\Phi D'$	$\Phi D-0.1 \sim +0.5$	$\Phi D-0.3 \sim +0.3$	$\Phi D-0.1 \sim +0.5$		
L'	$L+1.0 \max.$			$L-1 \sim +0.5$	

■ PART NUMBERING SYSTEM



PU series

■ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
6.3	220	5×7	14	3,800	500	SPU0JM221D07O00RAXXX
	270	5×7	14	4,100	500	SPU0JM271D07O00RAXXX
	330	5×8	14	4,400	500	SPU0JM331D08O00RAXXX
	330	6.3×5	17	3,400	500	SPU0JM331E05O00RAXXX
	330	6.3×8	10	4,400	500	SPU0JM331E08O00RAXXX
	390	5×9	14	4,500	500	SPU0JM391D09O00RAXXX
	470	5×10	14	4,700	592	SPU0JM471D10O00RAXXX
	470	5.5×9	14	4,500	592	SPU0JM471B09O00RAXXX
	470	6.3×8	10	4,800	592	SPU0JM471E08O00RAXXX
	560	5.5×9	14	4,700	706	SPU0JM561B09O00RAXXX
	560	6.3×8	8	5,200	706	SPU0JM561E08O00RAXXX
	680	5.5×9	14	5,200	857	SPU0JM681B09O00RAXXX
	680	6.3×9	14	5,500	857	SPU0JM681E09O00RAXXX
	680	8×9	14	5,000	857	SPU0JM681F09O00RAXXX
	820	6.3×9	14	5,500	1,033	SPU0JM821E09O00RAXXX
	1,000	6.3×10	8	5,600	1,260	SPU0JM102E10O00RAXXX
	1,000	8×11	8	5,700	1,260	SPU0JM102F11O00RAXXX
	1,200	8×11	8	5,800	1,512	SPU0JM122F11O00RAXXX
	1,500	8×11	8	5,900	1,890	SPU0JM152F11O00RAXXX
	1,500	10×12	8	6,000	1,890	SPU0JM152G12O00RAXXX
	1,800	10×10	8	6,100	2,268	SPU0JM182G10O00RAXXX
	2,200	8×14	8	6,200	2,772	SPU0JM222F14O00RAXXX
	2,200	10×12	8	6,300	2,772	SPU0JM222G12O00RAXXX
3,300	10×14	8	6,400	4,158	SPU0JM332G14O00RAXXX	
4,700	10×17	8	6,700	5,000	SPU0JM472G17O00RAXXX	
5,600	10×18	8	6,900	5,000	SPU0JM562G18O00RAXXX	
6.8	220	5×7	15	3,630	500	SPU0CM221D07O00RAXXX
	270	5×7	15	3,960	500	SPU0CM271D07O00RAXXX
	330	5×8	15	4,180	500	SPU0CM331D08O00RAXXX
	330	6.3×5	20	3,410	500	SPU0CM331E05O00RAXXX
	390	5×9	15	4,290	530	SPU0CM391D09O00RAXXX
	470	5×9	15	4,510	639	SPU0CM471D09O00RAXXX
	470	6.3×7	15	4,070	639	SPU0CM471E07O00RAXXX
	560	6.3×8	15	4,950	762	SPU0CM561E08O00RAXXX
	680	6.3×9	15	5,280	925	SPU0CM681E09O00RAXXX
	820	6.3×9	15	5,390	1,115	SPU0CM821E09O00RAXXX
	1,000	6.3×11	10	5,610	1,360	SPU0CM102E11O00RAXXX
	1,000	8×11	8	5,665	1,360	SPU0CM102F11O00RAXXX
	7	220	5×7	18	3,520	500
270		5×8	18	3,740	500	SPU0QM271D08O00RAXXX
330		5×9	18	3,960	500	SPU0QM331D09O00RAXXX
470		5.5×9	18	3,960	658	SPU0QM471B09O00RAXXX
470		6.3×8	18	4,180	658	SPU0QM471E08O00RAXXX
560		6.3×8	18	4,400	784	SPU0QM561E08O00RAXXX

Conductive Polymer Radial Type

PU series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
7	680	6.3×9	11	4,620	952	SPU0QM681E09O00RAXXX
	820	6.3×10	11	4,950	1,148	SPU0QM821E10O00RAXXX
	820	8×9	11	5,060	1,148	SPU0QM821F09O00RAXXX
7.5	220	5×7	18	3,410	500	SPU0AM221D07O00RAXXX
	270	5×8	18	3,630	500	SPU0AM271D08O00RAXXX
	330	5×9	18	3,850	500	SPU0AM331D09O00RAXXX
	390	5×9	18	3,850	585	SPU0AM391D09O00RAXXX
	470	5.5×9	18	3,905	705	SPU0AM471B09O00RAXXX
	470	6.3×7	23	3,520	705	SPU0AM471E07O00RAXXX
	500	5.5×9	18	3,960	750	SPU0AM501B09O00RAXXX
	560	6.3×8	18	4,290	840	SPU0AM561E08O00RAXXX
	680	6.3×9	11	4,510	1,020	SPU0AM681E09O00RAXXX
	820	6.3×10	11	4,840	1,230	SPU0AM821E10O00RAXXX
	820	8×9	11	5,005	1,230	SPU0AM821F09O00RAXXX
	1,200	8×11	11	5,280	1,800	SPU0AM122F11O00RAXXX
10	47	5×7	24	2,400	500	SPU1AM470D07O00RAXXX
	56	5×7	24	2,400	500	SPU1AM560D07O00RAXXX
	68	5×7	24	2,500	500	SPU1AM680D07O00RAXXX
	82	5×7	24	2,500	500	SPU1AM820D07O00RAXXX
	100	5×7	24	2,600	500	SPU1AM101D07O00RAXXX
	120	5×7	14	2,600	500	SPU1AM121D07O00RAXXX
	150	5×7	14	2,700	500	SPU1AM151D07O00RAXXX
	220	5×9	14	3,100	500	SPU1AM221D09O00RAXXX
	220	6.3×8	10	3,400	500	SPU1AM221E08O00RAXXX
	270	6.3×8	14	3,400	540	SPU1AM271E08O00RAXXX
	330	6.3×8	14	3,600	660	SPU1AM331E08O00RAXXX
	330	8×9	10	3,700	660	SPU1AM331F09O00RAXXX
	390	6.3×8	14	3,700	780	SPU1AM391E08O00RAXXX
	470	5.5×9	14	3,700	940	SPU1AM471B09O00RAXXX
	470	6.3×8	14	3,800	940	SPU1AM471E08O00RAXXX
	470	8×9	10	3,900	940	SPU1AM471F09O00RAXXX
	560	6.3×10	9	3,900	1,120	SPU1AM561E10O00RAXXX
	560	8×9	10	3,900	1,120	SPU1AM561F09O00RAXXX
	680	8×11	8	4,200	1,360	SPU1AM681F11O00RAXXX
	820	8×11	8	4,400	1,640	SPU1AM821F11O00RAXXX
	1,000	8×11	8	4,600	2,000	SPU1AM102F11O00RAXXX
	1,000	10×12	8	5,800	2,000	SPU1AM102G12O00RAXXX
	1,200	8×12	8	4,900	2,400	SPU1AM122F12O00RAXXX
	1,200	10×12	8	5,900	2,400	SPU1AM122G12O00RAXXX
	1,500	10×12	8	6,000	3,000	SPU1AM152G12O00RAXXX
	1,800	10×13	8	6,300	3,600	SPU1AM182G13O00RAXXX
	2,200	10×15	8	6,700	4,400	SPU1AM222G15O00RAXXX
	3,300	10×18	8	6,800	5,000	SPU1AM332G18O00RAXXX
12	330	5.5×9	18	3,410	792	SPU1TM331B09O00RAXXX

PU series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
12	470	5.5×9	18	3,520	1,128	SPU1TM471B09O00RAXXX
	470	6.3×9	18	3,795	1,128	SPU1TM471E09O00RAXXX
	560	6.3×10	14	3,740	1,344	SPU1TM561E10O00RAXXX
	680	6.3×11	14	3,960	1,632	SPU1TM681E11O00RAXXX
	680	8×10	14	4,070	1,632	SPU1TM681F10O00RAXXX
	820	8×11	11	4,180	1,968	SPU1TM821F11O00RAXXX
	1,000	8×12	11	4,400	2,400	SPU1TM102F12O00RAXXX
	1,200	8×14	11	4,840	2,880	SPU1TM122F14O00RAXXX
	1,500	8×16	11	5,280	3,600	SPU1TM152F16O00RAXXX
16	47	5×7	14	2,200	500	SPU1CM470D07O00RAXXX
	56	5×7	14	2,300	500	SPU1CM560D07O00RAXXX
	68	5×7	14	2,300	500	SPU1CM680D07O00RAXXX
	82	5×8	14	2,400	500	SPU1CM820D08O00RAXXX
	100	5×7	14	2,400	500	SPU1CM101D07O00RAXXX
	100	6.3×5	17	2,300	500	SPU1CM101E05O00RAXXX
	100	6.3×8	14	3,000	500	SPU1CM101E08O00RAXXX
	120	5×8	14	2,500	500	SPU1CM121D08O00RAXXX
	150	5×8	14	2,600	500	SPU1CM151D08O00RAXXX
	180	5×8	14	2,600	576	SPU1CM181D08O00RAXXX
	180	6.3×7	11	2,700	576	SPU1CM181E07O00RAXXX
	220	5×10	14	2,800	704	SPU1CM221D10O00RAXXX
	220	6.3×8	14	2,900	704	SPU1CM221E08O00RAXXX
	220	6.3×10	10	3,100	704	SPU1CM221E10O00RAXXX
	270	5.5×9	14	3,000	864	SPU1CM271B09O00RAXXX
	270	6.3×8	14	3,000	864	SPU1CM271E08O00RAXXX
	270	8×9	14	3,100	864	SPU1CM271F09O00RAXXX
	330	5.5×9	14	3,100	1,056	SPU1CM331B09O00RAXXX
	330	6.3×9	14	3,100	1,056	SPU1CM331E09O00RAXXX
	470	6.3×11	10	3,500	1,504	SPU1CM471E11O00RAXXX
	470	8×11	10	5,000	1,504	SPU1CM471F11O00RAXXX
	560	8×11	10	3,500	1,792	SPU1CM561F11O00RAXXX
	560	8×13	10	3,600	1,792	SPU1CM561F13O00RAXXX
	560	10×12	8	3,800	1,792	SPU1CM561G12O00RAXXX
	680	8×11	10	3,700	2,176	SPU1CM681F11O00RAXXX
	680	10×12	8	3,900	2,176	SPU1CM681G12O00RAXXX
	820	8×13	8	3,800	2,624	SPU1CM821F13O00RAXXX
	820	10×12	8	4,100	2,624	SPU1CM821G12O00RAXXX
	1,000	8×14	8	3,900	3,200	SPU1CM102F14O00RAXXX
	1,000	10×12	8	4,400	3,200	SPU1CM102G12O00RAXXX
	1,200	10×15	8	4,700	3,840	SPU1CM122G15O00RAXXX
	1,500	10×18	8	6,000	4,800	SPU1CM152G18O00RAXXX
	1,800	10×15	9	5,900	5,000	SPU1CM182G15O00RAXXX
	2,200	10×18	8	6,300	5,000	SPU1CM222G18O00RAXXX
20	39	5×8	36	2,145	500	SPU1DM390D08O00RAXXX

Conductive Polymer
Radial Type

PU series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
20	47	5×8	36	2,420	500	SPU1DM470D08O00RAXXX
	56	5×9	36	2,310	500	SPU1DM560D09O00RAXXX
	68	6.3×8	27	2,310	500	SPU1DM680E08O00RAXXX
	82	6.3×8	27	2,365	500	SPU1DM820E08O00RAXXX
	100	6.3×8	27	2,420	500	SPU1DM101E08O00RAXXX
	120	6.3×8	27	2,530	500	SPU1DM121E08O00RAXXX
	150	6.3×10	18	2,585	600	SPU1DM151E10O00RAXXX
	180	8×9	27	2,695	720	SPU1DM181F09O00RAXXX
	220	8×11	15	4,100	880	SPU1DM221F11O00RAXXX
	270	8×11	15	3,500	1,080	SPU1DM271F11O00RAXXX
	330	8×11	15	3,600	1,320	SPU1DM331F11O00RAXXX
	470	10×12	15	3,700	1,880	SPU1DM471G12O00RAXXX
	560	10×13	15	3,800	2,240	SPU1DM561G13O00RAXXX
	680	10×15	15	3,900	2,720	SPU1DM681G15O00RAXXX
	820	10×18	15	4,000	3,280	SPU1DM821G18O00RAXXX
25	1,000	10×18	15	4,300	4,000	SPU1DM102G18O00RAXXX
	39	5×8	42	2,000	500	SPU1EM390D08O00RAXXX
	47	5×9	42	2,100	500	SPU1EM470D09O00RAXXX
	56	5×9	42	2,200	500	SPU1EM560D09O00RAXXX
	68	6.3×7	21	2,300	500	SPU1EM680E07O00RAXXX
	82	6.3×7	21	2,300	500	SPU1EM820E07O00RAXXX
	100	6.3×8	21	2,700	500	SPU1EM101E08O00RAXXX
	100	6.3×10	14	3,000	500	SPU1EM101E10O00RAXXX
	100	8×11	14	3,300	500	SPU1EM101F11O00RAXXX
	120	6.3×8	21	2,700	600	SPU1EM121E08O00RAXXX
	150	6.3×10	14	3,000	750	SPU1EM151E10O00RAXXX
	180	8×9	21	2,700	900	SPU1EM181F09O00RAXXX
	220	8×11	14	3,300	1,100	SPU1EM221F11O00RAXXX
	220	10×12	14	3,800	1,100	SPU1EM221G12O00RAXXX
	270	8×11	14	3,300	1,350	SPU1EM271F11O00RAXXX
	330	8×11	14	3,400	1,650	SPU1EM331F11O00RAXXX
	330	10×12	14	4,100	1,650	SPU1EM331G12O00RAXXX
	470	8×16	14	3,700	2,350	SPU1EM471F16O00RAXXX
	470	10×12	14	4,400	2,350	SPU1EM471G12O00RAXXX
	560	10×12	14	4,400	2,800	SPU1EM561G12O00RAXXX
	680	10×15	14	4,700	3,400	SPU1EM681G15O00RAXXX
	820	10×18	14	4,900	4,100	SPU1EM821G18O00RAXXX
	1,000	10×18	14	4,900	5,000	SPU1EM102G18O00RAXXX

※Specifications subject to change without notice

PR series

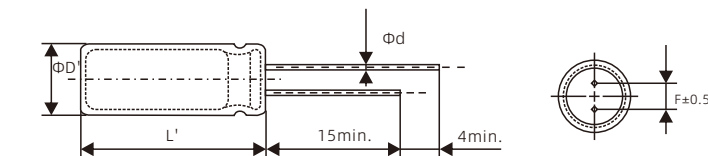
- Endurance :5,000 hours at 105°C
- Low ESR,long life,high ripple current
- Recommended applications: adaptor
- RoHS Compliant and lead-free



SPECIFICATIONS

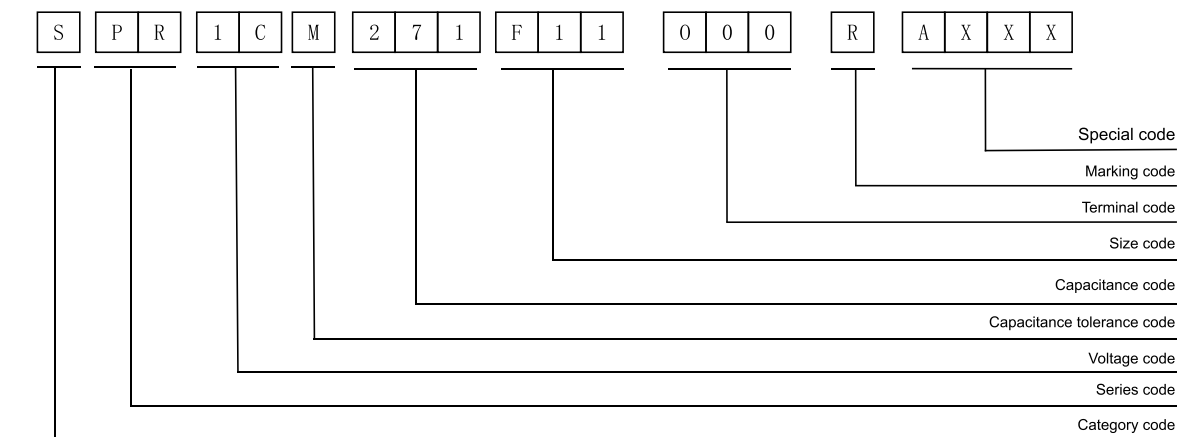
Items	Characteristics							
Category Temperature Range	-55~+105°C							
Rated Working Voltage Range	2.5~35 Vdc							
Nominal Capacitance Range	47~1,500μF							
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)							
DC Leakage Current	I≤0.2CV or 500μA, whichever is greater.							
	Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)							
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	2.5	6.3	10	16	25	35	(at 20°C,120Hz)
	Dissipation Factor (Max.)	0.08		0.12				
ESR(100kHz,20°C)	Value in characteristics table							
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+105°C)/Z(+20°C)≤1.5 Z(-55°C)/Z(+20°C)≤2.0							
Endurance	After applying rated voltage with rated ripple current for 5,000 hours at 105°C, the capacitors shall meet the following requirements							
	Appearance	No significant damage						
	Capacitance Change	≤±20% of the initial value						
	Dissipation Factor	≤150% of the initial specified value						
	ESR	≤150% of the initial specified value						
	Leakage Current	≤The initial specified value						
Humidity Test	After subjecting to 90%~95% RH for 1,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.							
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.							
	Appearance	No significant damage						
	Capacitance Change	≤±20% of the initial value						
	Dissipation Factor	≤150% of the initial specified value						
	ESR	≤150% of the initial specified value						
	Leakage Current	≤The initial specified value						

DIMENSIONS [mm]



ΦD	6.3	8	10
Φd	0.5	0.6	0.6
F	2.5	3.5	5
ΦD'	ΦD-0.1~+0.5		
L'	L+1.0max.	L-1~+0.5	

PART NUMBERING SYSTEM



PR series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
2.5	560	6.3×8	12	2,000	500	SPR0EM561E08O00RAXXX
	680	6.3×8	12	2,000	500	SPR0EM681E08O00RAXXX
	820	6.3×9	12	2,000	500	SPR0EM821E09O00RAXXX
	1,200	8×9	14	2,100	600	SPR0EM122F09O00RAXXX
6.3	330	6.3×8	12	1,900	500	SPR0JM331E08O00RAXXX
	470	6.3×8	12	1,900	592	SPR0JM471E08O00RAXXX
	470	8×9	14	2,100	592	SPR0JM471F09O00RAXXX
	560	6.3×8	12	1,900	706	SPR0JM561E08O00RAXXX
	680	8×11	12	2,200	857	SPR0JM681F11O00RAXXX
	820	8×11	12	2,200	1,033	SPR0JM821F11O00RAXXX
	1,000	8×11	12	2,300	1,260	SPR0JM102F11O00RAXXX
	1,200	8×11	12	2,300	1,512	SPR0JM122F11O00RAXXX
	1,500	10×12	12	2,500	1,890	SPR0JM152G12O00RAXXX
	220	6.3×8	12	1,700	500	SPR1AM221E08O00RAXXX
	270	6.3×8	12	1,700	540	SPR1AM271E08O00RAXXX
10	330	6.3×10	12	1,800	660	SPR1AM331E10O00RAXXX
	470	8×11	12	2,000	940	SPR1AM471F11O00RAXXX
	560	8×11	12	2,000	1,120	SPR1AM561F11O00RAXXX
	680	8×11	12	2,100	1,360	SPR1AM681F11O00RAXXX
	820	8×11	12	2,100	1,640	SPR1AM821F11O00RAXXX
	1,000	10×12	12	2,200	2,000	SPR1AM102G12O00RAXXX
	1,200	10×12	12	2,200	2,400	SPR1AM122G12O00RAXXX
	1,500	10×12	12	2,400	3,000	SPR1AM152G12O00RAXXX
	100	6.3×8	17	1,500	500	SPR1CM101E08O00RAXXX
16	180	6.3×8	17	1,500	576	SPR1CM181E08O00RAXXX
	220	6.3×10	17	1,600	704	SPR1CM221E10O00RAXXX
	270	8×11	14	1,700	864	SPR1CM271F11O00RAXXX
	330	6.3×10	14	1,600	1,056	SPR1CM331E10O00RAXXX
	470	8×11	14	1,700	1,504	SPR1CM471F11O00RAXXX
	560	10×12	14	2,000	1,792	SPR1CM561G12O00RAXXX
	680	10×12	14	2,000	2,176	SPR1CM681G12O00RAXXX
	820	10×12	14	2,100	2,624	SPR1CM821G12O00RAXXX
	1,000	10×12	14	2,100	3,200	SPR1CM102G12O00RAXXX
	68	6.3×7	24	1,300	500	SPR1EM680E07O00RAXXX
25	82	6.3×7	24	1,300	500	SPR1EM820E07O00RAXXX
	100	6.3×8	24	1,300	500	SPR1EM101E08O00RAXXX
	100	8×11	22	1,500	500	SPR1EM101F11O00RAXXX
	120	6.3×10	22	1,400	600	SPR1EM121E10O00RAXXX
	180	8×9	24	1,300	900	SPR1EM181F09O00RAXXX
	220	8×11	22	1,500	1,100	SPR1EM221F11O00RAXXX
	220	10×12	22	1,700	1,100	SPR1EM221G12O00RAXXX
	270	8×11	22	1,500	1,350	SPR1EM271F11O00RAXXX
	330	10×12	22	1,700	1,650	SPR1EM331G12O00RAXXX
	470	8×16	22	1,700	2,350	SPR1EM471F16O00RAXXX

PR series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
25	470	10×12	22	1,800	2,350	SPR1EM471G12O00RAXXX
	560	10×12	22	1,800	2,800	SPR1EM561G12O00RAXXX
35	47	6.3×7	52	1,100	500	SPR1VM470E07O00RAXXX
	56	6.3×7	52	1,100	500	SPR1VM560E07O00RAXXX
	68	6.3×7	52	1,100	500	SPR1VM680E07O00RAXXX
	82	6.3×7	52	1,100	574	SPR1VM820E07O00RAXXX
	100	6.3×10	42	1,200	700	SPR1VM101E10O00RAXXX
	150	10×12	32	1,400	1,050	SPR1VM151G12O00RAXXX
	220	8×11	32	1,300	1,540	SPR1VM221F11O00RAXXX
	220	10×12	32	1,400	1,540	SPR1VM221G12O00RAXXX
	270	10×12	32	1,400	1,890	SPR1VM271G12O00RAXXX
	330	10×12	32	1,400	2,310	SPR1VM331G12O00RAXXX

※Specifications subject to change without notice

Conductive Polymer
Radial Type

VZ series

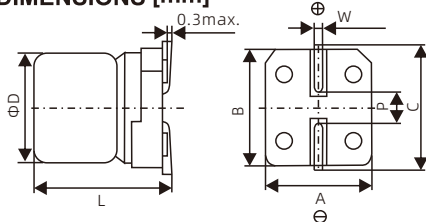
- Endurance: 2,000 hours at 105°C
- Standard
- Recommended applications: display card & system board
- **RoHS Compliant and lead-free**



SPECIFICATIONS

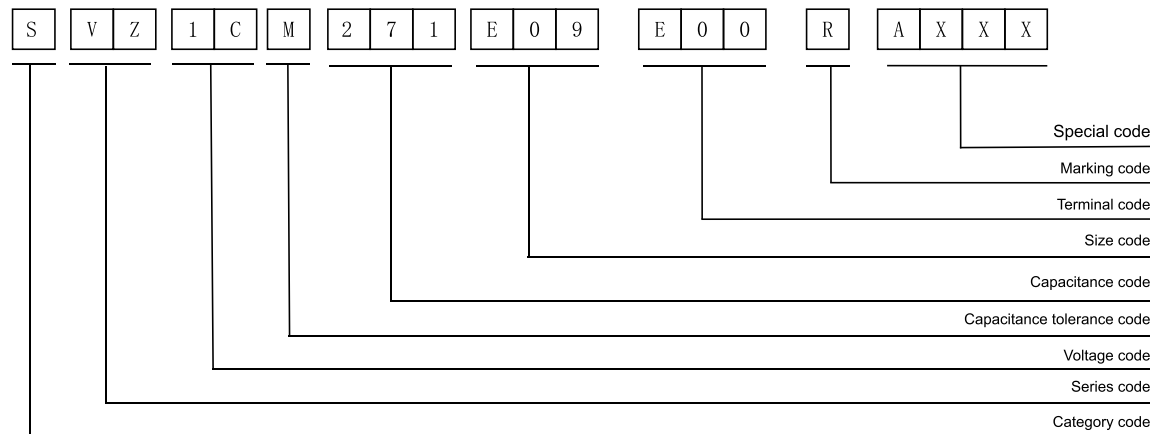
Items	Characteristics												
Category Temperature Range	-55~+105°C												
Rated Working Voltage Range	2.5 ~100 Vdc												
Nominal Capacitance Range	22~2,200μF												
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)												
DC Leakage Current	I≤0.2CV or 500μA, whichever is greater.												
	Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)												
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	2.5	6.3	10	16	25	35	50	63	80	100	(at 20°C,120Hz)	
	Dissipation Factor (Max.)	0.08			0.12						0.15		
ESR(100kHz,20°C)	Value in the characteristics table												
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+105°C)/Z(+20°C)≤1.5 Z(-55°C)/Z(+20°C)≤2.0												
Endurance	After applying rated voltage for 2,000 hours at 105°C,the capacitors shall meet the following requirements.												
	Appearance	No significant damage											
	Capacitance Change	±±20% of the initial value											
	Dissipation Factor	≤150% of the initial specified value											
	ESR	≤150% of the initial specified value											
	Leakage Current	≤The initial specified value											
Humidity Test	After subjecting to 90%~95% RH for 1,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.												
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.												
	Appearance	No significant damage											
	Capacitance Change	±±20% of the initial value											
	Dissipation Factor	≤150% of the initial specified value											
	ESR	≤150% of the initial specified value											
	Leakage Current	≤The initial specified value											

■ **DIMENSIONS [mm]**



Size Code	6.3	8	10
P±0.2	1.9	3.1	4.5
A±0.2	6.6	8.3	10.3
B±0.2	6.6	8.3	10.3
C±0.2	7.2	9	11
W	0.5~0.8	0.7~1.1	0.7~1.1
ØD'	ØD-0.1~+0.5		
L'	L±0.5		

PART NUMBERING SYSTEM



VZ series

■ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
2.5	330	6.3×6	20	2,700	500	SVZ0EM331E06E00RAXXX
	390	6.3×6	20	2,800	500	SVZ0EM391E06E00RAXXX
	470	6.3×6	20	2,900	500	SVZ0EM471E06E00RAXXX
	560	6.3×6	20	3,000	500	SVZ0EM561E06E00RAXXX
	680	6.3×9	15	4,300	500	SVZ0EM681E09E00RAXXX
6.3	220	6.3×6	20	2,800	500	SVZ0JM221E06E00RAXXX
	270	6.3×6	20	3,000	500	SVZ0JM271E06E00RAXXX
	330	6.3×6	20	3,000	500	SVZ0JM331E06E00RAXXX
	470	6.3×9	15	3,500	592	SVZ0JM471E09E00RAXXX
	560	6.3×9	15	3,700	706	SVZ0JM561E09E00RAXXX
	1,000	8×11.5	15	4,300	1,260	SVZ0JM102FBRE00RAXXX
	1,500	8×11.5	15	4,400	1,890	SVZ0JM152FBRE00RAXXX
	2,200	10×12.5	15	5,600	2,772	SVZ0JM222GCRE00RAXXX
10	120	6.3×6	30	2,700	500	SVZ1AM121E06E00RAXXX
	220	6.3×6	30	2,700	500	SVZ1AM221E06E00RAXXX
	220	6.3×9	20	3,000	500	SVZ1AM221E09E00RAXXX
	330	6.3×9	20	3,100	660	SVZ1AM331E09E00RAXXX
	470	6.3×9	30	3,400	940	SVZ1AM471E09E00RAXXX
	470	8×9.5	22	3,400	940	SVZ1AM471F9RE00RAXXX
	560	8×11.5	20	3,600	1,120	SVZ1AM561FBRE00RAXXX
	560	10×12.5	20	5,000	1,120	SVZ1AM561GCRE00RAXXX
	1,000	8×11.5	15	4,200	2,000	SVZ1AM102FBRE00RAXXX
	1,000	10×12.5	15	4,400	2,000	SVZ1AM102GCRE00RAXXX
	1,500	10×12.5	15	4,400	3,000	SVZ1AM152GCRE00RAXXX
16	47	6.3×6	40	1,700	500	SVZ1CM470E06E00RAXXX
	68	6.3×6	40	2,000	500	SVZ1CM680E06E00RAXXX
	100	6.3×6	30	2,400	500	SVZ1CM101E06E00RAXXX
	150	6.3×6	30	2,400	500	SVZ1CM151E06E00RAXXX
	150	6.3×9	25	2,600	500	SVZ1CM151E09E00RAXXX
	180	6.3×6	60	2,500	576	SVZ1CM181E06E00RAXXX
	180	6.3×9	25	2,700	576	SVZ1CM181E09E00RAXXX
	220	6.3×9	25	2,700	704	SVZ1CM221E09E00RAXXX
	270	6.3×9	25	2,700	864	SVZ1CM271E09E00RAXXX
	270	8×9.5	25	3,000	864	SVZ1CM271F9RE00RAXXX
	330	6.3×9	25	2,700	1,056	SVZ1CM331E09E00RAXXX
	330	8×11.5	20	4,000	1,056	SVZ1CM331FBRE00RAXXX
	330	10×12.5	20	5,000	1,056	SVZ1CM331GCRE00RAXXX
	560	8×11.5	20	4,000	1,792	SVZ1CM561FBRE00RAXXX
	680	10×12.5	20	5,000	2,176	SVZ1CM681GCRE00RAXXX
	1,000	10×12.5	20	5,000	3,200	SVZ1CM102GCRE00RAXXX
25	22	6.3×6	80	1,600	500	SVZ1EM220E06E00RAXXX
	27	6.3×6	50	1,100	500	SVZ1EM270E06E00RAXXX
	47	6.3×6	50	1,800	500	SVZ1EM470E06E00RAXXX
	47	6.3×9	35	2,000	500	SVZ1EM470E09E00RAXXX

VZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
25	56	6.3×6	50	1,800	500	SVZ1EM560E06E00RAXXX
	68	6.3×6	50	1,800	500	SVZ1EM680E06E00RAXXX
	100	6.3×6	50	2,100	500	SVZ1EM101E06E00RAXXX
	100	6.3×9	30	2,400	500	SVZ1EM101E09E00RAXXX
	150	6.3×9	30	2,500	750	SVZ1EM151E09E00RAXXX
	220	6.3×9	30	2,500	1,100	SVZ1EM221E09E00RAXXX
	220	8×11.5	30	2,600	1,100	SVZ1EM221FBRE00RAXXX
	330	8×11.5	30	2,700	1,650	SVZ1EM331FBRE00RAXXX
	330	10×12.5	22	2,800	1,650	SVZ1EM331GCRE00RAXXX
	470	8×11.5	30	2,800	2,350	SVZ1EM471FBRE00RAXXX
	470	10×12.5	22	3,100	2,350	SVZ1EM471GCRE00RAXXX
	560	10×12.5	22	3,300	2,800	SVZ1EM561GCRE00RAXXX
35	680	10×12.5	22	3,300	3,400	SVZ1EM681GCRE00RAXXX
	22	6.3×6	60	1,100	500	SVZ1VM220E06E00RAXXX
	27	6.3×6	60	1,100	500	SVZ1VM270E06E00RAXXX
	33	6.3×6	60	1,100	500	SVZ1VM330E06E00RAXXX
	47	6.3×6	45	1,100	500	SVZ1VM470E06E00RAXXX
	47	6.3×9	50	1,500	500	SVZ1VM470E09E00RAXXX
	68	6.3×6	45	1,100	500	SVZ1VM680E06E00RAXXX
	68	6.3×9	40	1,800	500	SVZ1VM680E09E00RAXXX
	100	6.3×9	40	2,100	700	SVZ1VM101E09E00RAXXX
	100	8×9.5	40	2,800	700	SVZ1VM101F9RE00RAXXX
	100	8×11.5	30	3,000	700	SVZ1VM101FBRE00RAXXX
	150	8×11.5	30	3,000	1,050	SVZ1VM151FBRE00RAXXX
	220	8×11.5	30	2,400	1,540	SVZ1VM221FBRE00RAXXX
	270	8×11.5	30	2,500	1,890	SVZ1VM271FBRE00RAXXX
	270	10×12.5	30	2,700	1,890	SVZ1VM271GCRE00RAXXX
50	330	10×12.5	30	2,700	2,310	SVZ1VM331GCRE00RAXXX
	470	10×12.5	30	3,000	3,290	SVZ1VM471GCRE00RAXXX
	68	8×11.5	30	2,000	680	SVZ1HM680FBRE00RAXXX
	82	8×11.5	30	2,000	820	SVZ1HM820FBRE00RAXXX
	82	10×12.5	30	2,000	820	SVZ1HM820GCRE00RAXXX
	100	8×11.5	30	2,000	1,000	SVZ1HM101FBRE00RAXXX
	100	10×12.5	30	2,100	1,000	SVZ1HM101GCRE00RAXXX
	120	8×11.5	30	2,000	1,200	SVZ1HM121FBRE00RAXXX
63	150	10×12.5	30	2,100	1,500	SVZ1HM151GCRE00RAXXX
	220	10×12.5	30	2,300	2,200	SVZ1HM221GCRE00RAXXX
	47	8×9.5	60	1,000	592	SVZ1JM470F9RE00RAXXX
	56	8×11.5	40	1,400	706	SVZ1JM560FBRE00RAXXX
80	100	10×12.5	40	1,600	1,260	SVZ1JM101GCRE00RAXXX
	27	8×11.5	50	600	500	SVZ1BM270FBRE00RAXXX
	47	10×12.5	50	900	752	SVZ1BM470GCRE00RAXXX
100	68	10×12.5	50	900	1,088	SVZ1BM680GCRE00RAXXX
	22	8×11.5	50	600	500	SVZ1KM220FBRE00RAXXX

VZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
100	47	10×12.5	50	900	940	SVZ1KM470GCRE00RAXXX

※Specifications subject to change without notice

VD series

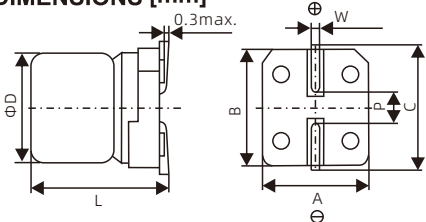
- Endurance: 2,000 hours at 105°C
- High voltage
- Recommended applications: high order main board, service equipment
- RoHS Compliant and lead-free



SPECIFICATIONS

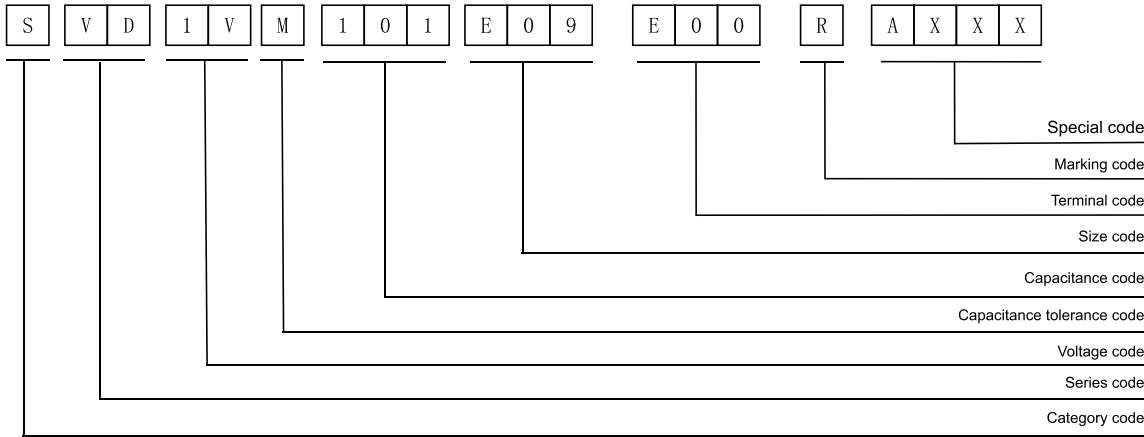
Items	Characteristics				
Category Temperature Range	-55~+105°C				
Rated Working Voltage Range	35 ~63Vdc				
Nominal Capacitance Range	22~470μF				
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)				
DC Leakage Current	I≤0.2CV or 500μA, whichever is greater.				
	Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)				
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	35	50	63	(at 20°C,120Hz)
	Dissipation Factor (Max.)	0.12			
ESR(100kHz,20°C)	Value in the characteristics table				
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+105°C)/Z(+20°C)≤1.5 Z(-55°C)/Z(+20°C)≤2.0				
Endurance	After applying rated voltage for 2,000 hours at 105°C,the capacitors shall meet the following requirements.				
	Appearance	No significant damage			
	Capacitance Change	±20% of the initial value			
	Dissipation Factor	≤150% of the initial specified value			
	ESR	≤150% of the initial specified value			
	Leakage Current	≤The initial specified value			
Humidity Test	After subjecting to 90%~95% RH for 1,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.				
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.				
	Appearance	No significant damage			
	Capacitance Change	±20% of the initial value			
	Dissipation Factor	≤150% of the initial specified value			
	ESR	≤150% of the initial specified value			
	Leakage Current	≤The initial specified value			

DIMENSIONS [mm]



Size Code	6.3	8	10
P±0.2	1.9	3.1	4.5
A±0.2	6.6	8.3	10.3
B±0.2	6.6	8.3	10.3
C±0.2	7.2	9	11
W	0.5~0.8	0.7~1.1	0.7~1.1
ØD'	ØD-0.1~+0.5		
L'	L±0.5		

PART NUMBERING SYSTEM



VD series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
35	22	6.3×6	54	1,100	500	SVD1VM220E06E00RAXXX
	27	6.3×6	54	1,100	500	SVD1VM270E06E00RAXXX
	33	6.3×6	54	1,100	500	SVD1VM330E06E00RAXXX
	47	6.3×6	40	1,100	500	SVD1VM470E06E00RAXXX
	47	6.3×9	45	1,500	500	SVD1VM470E09E00RAXXX
	68	6.3×6	40	1,100	500	SVD1VM680E06E00RAXXX
	68	6.3×9	36	1,800	500	SVD1VM680E09E00RAXXX
	100	6.3×9	36	2,200	700	SVD1VM101E09E00RAXXX
	100	8×9.5	36	2,900	700	SVD1VM101F9RE00RAXXX
	100	8×11.5	27	3,100	700	SVD1VM101FBRE00RAXXX
	150	8×11.5	27	3,100	1,050	SVD1VM151FBRE00RAXXX
	220	8×11.5	27	2,500	1,540	SVD1VM221FBRE00RAXXX
	270	8×11.5	27	2,600	1,890	SVD1VM271FBRE00RAXXX
	270	10×12.5	27	2,800	1,890	SVD1VM271GCRE00RAXXX
	330	10×12.5	27	2,800	2,310	SVD1VM331GCRE00RAXXX
50	470	10×12.5	27	3,100	3,290	SVD1VM471GCRE00RAXXX
	68	8×11.5	27	2,100	680	SVD1HM680FBRE00RAXXX
	82	8×11.5	27	2,100	820	SVD1HM820FBRE00RAXXX
	82	10×12.5	27	2,100	820	SVD1HM820GCRE00RAXXX
	100	8×9.5	54	1,500	1,000	SVD1HM101F9RE00RAXXX
	100	8×11.5	27	2,100	1,000	SVD1HM101FBRE00RAXXX
	100	10×12.5	27	2,200	1,000	SVD1HM101GCRE00RAXXX
	120	8×11.5	27	2,100	1,200	SVD1HM121FBRE00RAXXX
63	150	10×12.5	27	2,200	1,500	SVD1HM151GCRE00RAXXX
	220	10×12.5	27	2,400	2,200	SVD1HM221GCRE00RAXXX
	47	8×9.5	54	1,000	592	SVD1JM470F9RE00RAXXX
	56	8×11.5	36	1,000	706	SVD1JM560FBRE00RAXXX
	100	10×12.5	36	1,600	1,260	SVD1JM101GCRE00RAXXX

※Specifications subject to change without notice

VT series

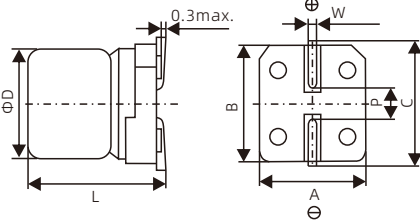
- Endurance: 2,000 hours at 125°C
- High temperature
- Recommended applications: lamps power, LED power, service equipment
- RoHS Compliant and lead-free



SPECIFICATIONS

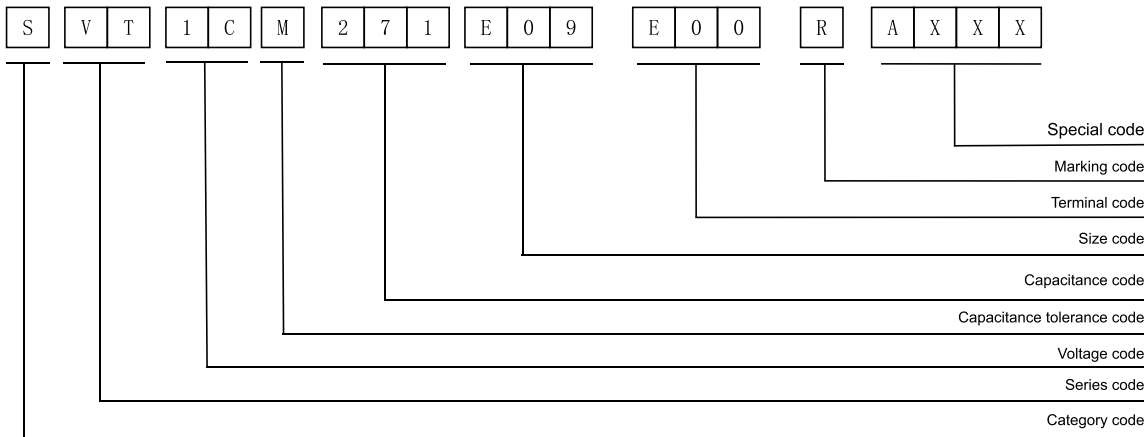
Items	Characteristics									
Category Temperature Range	-55~+125°C									
Rated Working Voltage Range	2.5 ~63Vdc									
Nominal Capacitance Range	22~2,200μF									
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)									
DC Leakage Current	I≤0.2CV or 500μA, whichever is greater.									
	Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)									
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	2.5	6.3	10	16	25	35	50	63	(at 20°C,120Hz)
	Dissipation Factor (Max.)	0.12		0.12						
ESR(100kHz,20°C)	Value in the characteristics table									
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+125°C)/Z(+20°C)≤1.5 Z(-55°C)/Z(+20°C)≤2.0									
Endurance	After applying rated voltage for 2,000 hours at 125°C,the capacitors shall meet the following requirements.									
	Appearance	No significant damage								
	Capacitance Change	≤±20% of the initial value								
	Dissipation Factor	≤150% of the initial specified value								
	ESR	≤150% of the initial specified value								
	Leakage Current	≤The initial specified value								
Humidity Test	After subjecting to 90%~95% RH for 1,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.									
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.									
	Appearance	No significant damage								
	Capacitance Change	≤±20% of the initial value								
	Dissipation Factor	≤150% of the initial specified value								
	ESR	≤150% of the initial specified value								
	Leakage Current	≤The initial specified value								

DIMENSIONS [mm]



Size Code	6.3	8	10
P±0.2	1.9	3.1	4.5
A±0.2	6.6	8.3	10.3
B±0.2	6.6	8.3	10.3
C±0.2	7.2	9	11
W	0.5~0.8	0.7~1.1	0.7~1.1
ØD'	ØD-0.1~+0.5		
L'	L±0.5		

PART NUMBERING SYSTEM



VT series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ØD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/125°C,100kHz)	Leakage Current (μA)(max)	Part Number
2.5	330	6.3×6	30	800	500	SVT0EM331E06E00RAXXX
	390	6.3×6	30	800	500	SVT0EM391E06E00RAXXX
	470	6.3×6	30	800	500	SVT0EM471E06E00RAXXX
	560	6.3×6	30	900	500	SVT0EM561E06E00RAXXX
	680	6.3×9	22	1,200	500	SVT0EM681E09E00RAXXX
6.3	220	6.3×6	30	800	500	SVT0JM221E06E00RAXXX
	270	6.3×6	30	900	500	SVT0JM271E06E00RAXXX
	330	6.3×6	30	900	500	SVT0JM331E06E00RAXXX
	470	6.3×9	22	1,000	592	SVT0JM471E09E00RAXXX
	560	6.3×9	22	1,100	706	SVT0JM561E09E00RAXXX
	1,000	8×11.5	22	1,200	1,260	SVT0JM102FBRE00RAXXX
	1,500	8×11.5	22	1,300	1,890	SVT0JM152FBRE00RAXXX
	2,200	10×12.5	22	1,600	2,772	SVT0JM222GCRE00RAXXX
10	120	6.3×6	45	800	500	SVT1AM121E06E00RAXXX
	220	6.3×6	45	800	500	SVT1AM221E06E00RAXXX
	220	6.3×9	30	900	500	SVT1AM221E09E00RAXXX
	330	6.3×9	30	900	660	SVT1AM331E09E00RAXXX
	560	8×11.5	30	1,000	1,120	SVT1AM561FBRE00RAXXX
	560	10×12.5	30	1,500	1,120	SVT1AM561GCRE00RAXXX
	1,000	8×11.5	22	1,200	2,000	SVT1AM102FBRE00RAXXX
	1,000	10×12.5	22	1,300	2,000	SVT1AM102GCRE00RAXXX
	1,500	10×12.5	22	1,300	3,000	SVT1AM152GCRE00RAXXX
	47	6.3×6	60	500	500	SVT1CM470E06E00RAXXX
	68	6.3×6	60	600	500	SVT1CM680E06E00RAXXX
	100	6.3×6	45	700	500	SVT1CM101E06E00RAXXX
	150	6.3×6	45	700	500	SVT1CM151E06E00RAXXX
16	150	6.3×9	37	700	500	SVT1CM151E09E00RAXXX
	180	6.3×6	90	700	576	SVT1CM181E06E00RAXXX
	180	6.3×9	37	800	576	SVT1CM181E09E00RAXXX
	220	6.3×9	37	700	704	SVT1CM221E09E00RAXXX
	270	6.3×9	37	700	864	SVT1CM271E09E00RAXXX
	560	8×11.5	30	1,000	1,792	SVT1CM561FBRE00RAXXX
	680	10×12.5	30	1,200	2,176	SVT1CM681GCRE00RAXXX
	1,000	10×12.5	30	1,200	3,200	SVT1CM102GCRE00RAXXX
25	27	6.3×6	75	300	500	SVT1EM270E06E00RAXXX
	47	6.3×6	75	500	500	SVT1EM470E06E00RAXXX
	47	6.3×9	52	600	500	SVT1EM470E09E00RAXXX
	56	6.3×6	75	500	500	SVT1EM560E06E00RAXXX
	100	6.3×6	75	600	500	SVT1EM101E06E00RAXXX
	100	6.3×9	45	700	500	SVT1EM101E09E00RAXXX
	150	6.3×9	45	700	750	SVT1EM151E09E00RAXXX
	220	8×11.5	45	700	1,100	SVT1EM221FBRE00RAXXX
	330	8×11.5	45	800	1,650	SVT1EM331FBRE00RAXXX
	330	10×12.5	33	800	1,650	SVT1EM331GCRE00RAXXX

VT series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mA rms/125°C,100kHz)	Leakage Current (μA)(max)	Part Number
25	470	10×12.5	33	900	2,350	SVT1EM471GCRE00RAXXX
35	22	6.3×6	90	300	500	SVT1VM220E06E00RAXXX
	27	6.3×6	90	300	500	SVT1VM270E06E00RAXXX
	33	6.3×6	90	300	500	SVT1VM330E06E00RAXXX
	47	6.3×6	67	300	500	SVT1VM470E06E00RAXXX
	47	6.3×9	75	400	500	SVT1VM470E09E00RAXXX
	68	6.3×9	60	500	500	SVT1VM680E09E00RAXXX
	100	6.3×9	60	600	700	SVT1VM101E09E00RAXXX
	100	8×11.5	45	900	700	SVT1VM101FBRE00RAXXX
	150	8×11.5	45	900	1,050	SVT1VM151FBRE00RAXXX
	220	8×11.5	45	700	1,540	SVT1VM221FBRE00RAXXX
	270	8×11.5	45	700	1,890	SVT1VM271FBRE00RAXXX
	270	10×12.5	45	800	1,890	SVT1VM271GCRE00RAXXX
50	82	10×12.5	45	600	820	SVT1HM820GCRE00RAXXX
	100	8×11.5	45	600	1,000	SVT1HM101FBRE00RAXXX
	120	8×11.5	45	600	1,200	SVT1HM121FBRE00RAXXX
	220	10×12.5	45	600	2,200	SVT1HM221GCRE00RAXXX
63	56	8×11.5	60	400	706	SVT1JM560FBRE00RAXXX
	100	10×12.5	60	400	1,260	SVT1JM101GCRE00RAXXX

※Specifications subject to change without notice

VF series

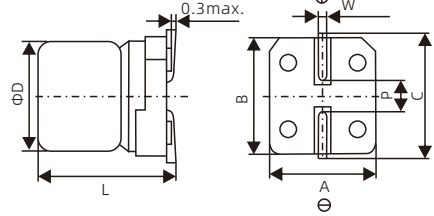
- Endurance: 3,000~5,000 hours at 105°C
- Long life
- Recommended applications: system board, display card, small changer and intelligent TV
- RoHS Compliant and lead-free



SPECIFICATIONS

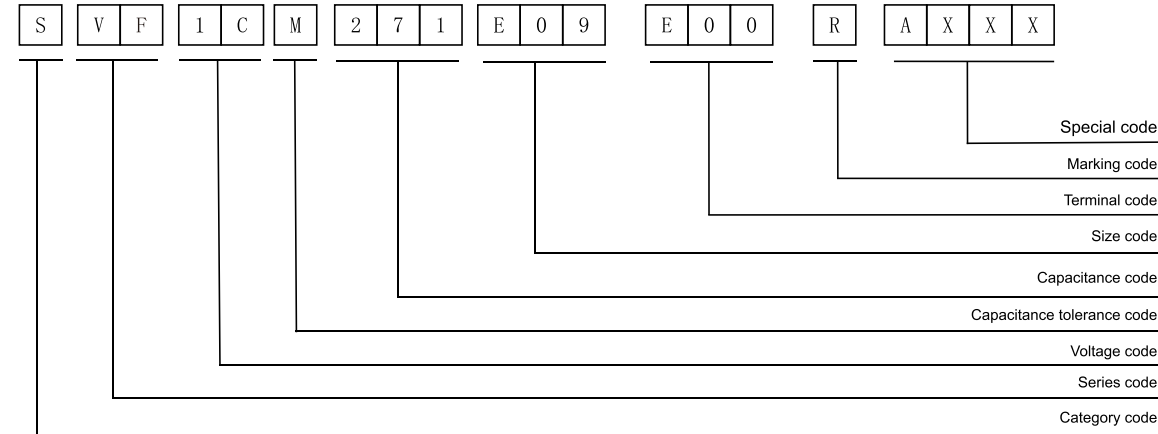
Items	Characteristics									
Category Temperature Range	-55~+105°C									
Rated Working Voltage Range	2.5 ~63Vdc									
Nominal Capacitance Range	22~2,200μF									
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)									
DC Leakage Current	I≤0.2CV or 500μA, whichever is greater.									
	Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)									
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	2.5	6.3	10	16	25	35	50	63	(at 20°C,120Hz)
	Dissipation Factor (Max.)	0.08			0.12					
ESR(100kHz,20°C)	Value in the characteristics table									
Temperature Characteristic (Impedance Ratio at 100kHz)	Z(+105°C)/Z(+20°C)≤1.5 Z(-55°C)/Z(+20°C)≤2.0									
Endurance	After applying rated voltage for 3,000~5,000 hours at 105°C,the capacitors shall meet the following requirements.									
	Appearance	No significant damage								
	Capacitance Change	≤±20% of the initial value								
	Dissipation Factor	≤150% of the initial specified value								
	ESR	≤150% of the initial specified value								
	Leakage Current	≤The initial specified value								
Humidity Test	After subjecting to 90%~95% RH for 1,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.									
Surge Test	After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements.									
	Appearance	No significant damage								
	Capacitance Change	≤±20% of the initial value								
	Dissipation Factor	≤150% of the initial specified value								
	ESR	≤150% of the initial specified value								
	Leakage Current	≤The initial specified value								

DIMENSIONS [mm]



Size Code	6.3	8	10
P±0.2	1.9	3.1	4.5
A±0.2	6.6	8.3	10.3
B±0.2	6.6	8.3	10.3
C±0.2	7.2	9	11
W	0.5~0.8	0.7~1.1	0.7~1.1
ØD'	ØD-0.1~+0.5		
L'	L±0.5		

PART NUMBERING SYSTEM



Conductive Polymer
Surface Mount Type

VF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
2.5	330	6.3×6	22	2,400	500	SVF0EM331E06E00RAXXX
	390	6.3×6	22	2,500	500	SVF0EM391E06E00RAXXX
	470	6.3×6	22	2,600	500	SVF0EM471E06E00RAXXX
	560	6.3×6	22	2,700	500	SVF0EM561E06E00RAXXX
	680	6.3×9	16	3,800	500	SVF0EM681E09E00RAXXX
6.3	220	6.3×6	22	2,500	500	SVF0JM221E06E00RAXXX
	270	6.3×6	22	2,700	500	SVF0JM271E06E00RAXXX
	330	6.3×6	22	2,700	500	SVF0JM331E06E00RAXXX
	470	6.3×9	16	3,100	592	SVF0JM471E09E00RAXXX
	560	6.3×9	16	3,300	706	SVF0JM561E09E00RAXXX
	1,000	8×11.5	16	3,800	1,260	SVF0JM102FBRE00RAXXX
	1,500	8×11.5	16	3,900	1,890	SVF0JM152FBRE00RAXXX
	2,200	10×12.5	16	5,000	2,772	SVF0JM222GCRE00RAXXX
10	120	6.3×6	33	2,400	500	SVF1AM121E06E00RAXXX
	220	6.3×6	33	2,400	500	SVF1AM221E06E00RAXXX
	220	6.3×9	22	2,700	500	SVF1AM221E09E00RAXXX
	330	6.3×9	22	2,700	660	SVF1AM331E09E00RAXXX
	560	8×11.5	22	3,200	1,120	SVF1AM561FBRE00RAXXX
	560	10×12.5	22	4,500	1,120	SVF1AM561GCRE00RAXXX
	1,000	8×11.5	16	3,700	2,000	SVF1AM102FBRE00RAXXX
	1,000	10×12.5	16	3,900	2,000	SVF1AM102GCRE00RAXXX
	1,500	10×12.5	16	3,900	3,000	SVF1AM152GCRE00RAXXX
16	47	6.3×6	44	1,500	500	SVF1CM470E06E00RAXXX
	68	6.3×6	44	1,800	500	SVF1CM680E06E00RAXXX
	100	6.3×6	33	2,100	500	SVF1CM101E06E00RAXXX
	150	6.3×6	33	2,100	500	SVF1CM151E06E00RAXXX
	150	6.3×9	27	2,300	500	SVF1CM151E09E00RAXXX
	180	6.3×6	66	2,200	576	SVF1CM181E06E00RAXXX
	180	6.3×9	27	2,400	576	SVF1CM181E09E00RAXXX
	220	6.3×9	27	2,200	704	SVF1CM221E09E00RAXXX
	270	6.3×9	27	2,300	864	SVF1CM271E09E00RAXXX
	270	8×9.5	27	2,500	864	SVF1CM271F9RE00RAXXX
	560	8×11.5	22	3,100	1,792	SVF1CM561FBRE00RAXXX
	680	10×12.5	22	3,600	2,176	SVF1CM681GCRE00RAXXX
	1,000	10×12.5	22	3,600	3,200	SVF1CM102GCRE00RAXXX
25	27	6.3×6	55	900	500	SVF1EM270E06E00RAXXX
	47	6.3×6	55	1,600	500	SVF1EM470E06E00RAXXX
	47	6.3×9	38	1,800	500	SVF1EM470E09E00RAXXX
	56	6.3×6	55	1,600	500	SVF1EM560E06E00RAXXX
	100	6.3×6	55	1,800	500	SVF1EM101E06E00RAXXX
	100	6.3×9	33	2,100	500	SVF1EM101E09E00RAXXX
	150	6.3×9	33	2,200	750	SVF1EM151E09E00RAXXX
	220	8×11.5	33	2,300	1,100	SVF1EM221FBRE00RAXXX
	330	8×11.5	33	2,400	1,650	SVF1EM331FBRE00RAXXX

VF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	ESR (mΩ,20°C,100kHz) (max)	Rated Ripple Current (mArms/105°C,100kHz)	Leakage Current (μA)(max)	Part Number
25	330	10×12.5	24	2,500	1,650	SVF1EM331GCRE00RAXXX
	470	10×12.5	24	2,700	2,350	SVF1EM471GCRE00RAXXX
35	22	6.3×6	66	900	500	SVF1VM220E06E00RAXXX
	27	6.3×6	66	900	500	SVF1VM270E06E00RAXXX
	33	6.3×6	66	900	500	SVF1VM330E06E00RAXXX
	47	6.3×6	49	900	500	SVF1VM470E06E00RAXXX
	47	6.3×9	55	1,300	500	SVF1VM470E09E00RAXXX
	68	6.3×9	44	1,600	500	SVF1VM680E09E00RAXXX
	100	6.3×9	44	1,800	700	SVF1VM101E09E00RAXXX
	100	8×11.5	33	2,700	700	SVF1VM101FBRE00RAXXX
	150	8×11.5	33	2,700	1,050	SVF1VM151FBRE00RAXXX
	220	8×11.5	33	2,100	1,540	SVF1VM221FBRE00RAXXX
	270	8×11.5	33	2,200	1,890	SVF1VM271FBRE00RAXXX
	270	10×12.5	33	2,400	1,890	SVF1VM271GCRE00RAXXX
	330	10×12.5	33	2,400	2,310	SVF1VM331GCRE00RAXXX
	470	10×12.5	33	2,700	3,290	SVF1VM471GCRE00RAXXX
50	82	10×12.5	33	1,800	820	SVF1HM820GCRE00RAXXX
	100	8×11.5	33	1,800	1,000	SVF1HM101FBRE00RAXXX
	120	8×11.5	33	1,800	1,200	SVF1HM121FBRE00RAXXX
	220	10×12.5	33	2,000	2,200	SVF1HM221GCRE00RAXXX
63	47	8×9.5	66	900	592	SVF1JM470F9RE00RAXXX
	56	8×11.5	44	1,200	706	SVF1JM560FBRE00RAXXX
	100	10×12.5	44	1,400	1,260	SVF1JM101GCRE00RAXXX

※Specifications subject to change without notice

Conductive Polymer
Surface Mount Type

MK series

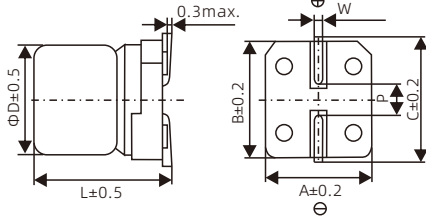
- Endurance: 2,000 hours at 105°C
- General product
- Designed for surface mounting on high density PC board
- RoHS Compliant



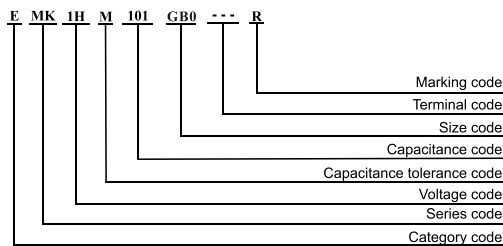
SPECIFICATIONS

Items	Characteristics								
Category Temperature Range	-55 ~ +105°C								
Rated Voltage Range	6.3 ~ 100 Vdc								
Capacitance Tolerance	±20% (M) (at 20°C,120Hz)								
Leakage Current	6.3 ~ 100 Vdc				(at 20°C)				
	Is0.01CV or 3μA, whichever is greater (2 minutes)								
	Where, I: Max. leakage current (μA), C: Nominal capacitance (μF), V: Rated voltage (V)								
Dissipation Factor	Rated Voltage (Vdc)		6.3	10	16	25	35	50~100	(at 20°C,120Hz)
	Dissipation Factor(Max.)	D80 ~ E83	0.30	0.24	0.20	0.16	0.14	0.12	
		FB0 ~ WG5	0.40	0.30	0.26	0.16	0.14	0.12	
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)		6.3	10	16	25	35	50~100	(at 120Hz)
	Z(-25°C)/Z(+20°C)		4	3	2	2	2	2	
	Z(-40°C)/Z(+20°C)		6	4	3	3	3	3	
	Z(-55°C)/Z(+20°C)		8	6	4	3	3	3	
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after rated voltage is applied for a specified period of time at 105°C.								
	Load Life	2,000 hours							
	Capacitance Change	≤±20% of the initial value							
	Dissipation Factor	≤200% of the initial specified value							
	Leakage Current	≤The initial specified value							
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 500 hours								
	Capacitance Change	≤±20% of the initial value							
	Dissipation Factor	≤200% of the initial specified value							
	Leakage Current	≤ 200% of the initial specified value							

DIMENSIONS [mm]



PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Freq. (Hz)	120	1K	10K	100K
Cap. (μF)				
4.7 ≤ Cap. ≤ 1,000	0.50	0.80	0.90	1.00

MK series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size Code	Rated Ripple Current (mArms/105°C, 100kHz)	Part Number
6.3	100	D80	105	EMK0JM101D80---R
	220	E83	160	EMK0JM221E83---R
	330	FB0	340	EMK0JM331FB0---R
	470	FB0	370	EMK0JM471FB0---R
	680	GB0	670	EMK0JM681GB0---R
	1,000	GB0	860	EMK0JM102GB0---R
10	33	D80	105	EMK1AM330D80---R
	100	E83	175	EMK1AM101E83---R
	220	E83	180	EMK1AM221E83---R
	330	FB0	340	EMK1AM331FB0---R
	470	FB0	360	EMK1AM471FB0---R
	820	GB0	860	EMK1AM821GB0---R
16	1,000	GB0	900	EMK1AM102GB0---R
	47	D80	105	EMK1CM470D80---R
	100	E83	175	EMK1CM101E83---R
	150	E83	190	EMK1CM151E83---R
	220	FB0	500	EMK1CM221FB0---R
	330	FB0	545	EMK1CM331FB0---R
25	470	FB0	560	EMK1CM471FB0---R
	680	GB0	850	EMK1CM681GB0---R
	1,000	WE0	1,050	EMK1CM102WE0---R
	33	D80	105	EMK1EM330D80---R
	47	E83	180	EMK1EM470E83---R
	100	E83	205	EMK1EM101E83---R
35	220	FB0	550	EMK1EM221FB0---R
	330	GB0	780	EMK1EM331GB0---R
	470	GB0	800	EMK1EM471GB0---R
	680	WE0	950	EMK1EM681WE0---R
	1,000	WE0	1,280	EMK1EM102WE0---R
	10	D80	105	EMK1VM100D80---R
50	22	D80	110	EMK1VM220D80---R
	47	E83	210	EMK1VM470E83---R
	100	FB0	575	EMK1VM101FB0---R
	220	GB0	835	EMK1VM221GB0---R
	330	GB0	850	EMK1VM331GB0---R
	470	WE0	980	EMK1VM471WE0---R
63	680	WG5	1,280	EMK1VM681WG5---R
	10	E83	120	EMK1HM100E83---R
	22	E83	175	EMK1HM220E83---R
	33	E83	180	EMK1HM330E83---R
	47	E83	190	EMK1HM470E83---R
	47	FB0	540	EMK1HM470FB0---R
63	100	FB0	600	EMK1HM101FB0---R
	100	GB0	700	EMK1HM101GB0---R
	220	GB0	700	EMK1HM221GB0---R
	330	WE0	950	EMK1HM331WE0---R
	470	WG5	1,300	EMK1HM471WG5---R
	10	D80	85	EMK1JM100D80---R
63	22	E83	150	EMK1JM220E83---R
	33	FB0	375	EMK1JM330FB0---R
	47	FB0	450	EMK1JM470FB0---R
	100	GB0	575	EMK1JM101GB0---R

WV (Vdc)	Cap (μF)	Size Code	Rated Ripple Current (mArms/105°C, 100kHz)	Part Number
63	220	WE0	890	EMK1JM221WE0---R
	330	WG5	960	EMK1JM331WG5---R
80	10	E83	140	EMK1BM100E83---R
	22	FB0	375	EMK1BM220FB0---R
	33	FB0	450	EMK1BM330FB0---R
	47	GB0	575	EMK1BM470GB0---R
	100	WE0	760	EMK1BM101WE0---R
	150	WE0	800	EMK1BM151WE0---R
100	220	WG5	960	EMK1BM221WG5---R
	4.7	D80	70	EMK1KM470D80---R
	10	E83	135	EMK1KM100E83---R
	22	FB0	345	EMK1KM220FB0---R
	33	GB0	560	EMK1KM330GB0---R
	47	GB0	575	EMK1KM470GB0---R
100	100	WE0	680	EMK1KM101WE0---R
	150	WG5	890	EMK1KM151WG5---R

※Specifications subject to change without notice

MF series

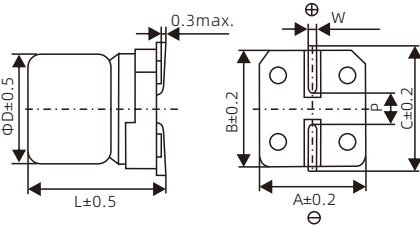
- Endurance: 5,000 hours at 105°C
- Long life
- Designed for surface mounting on high density PC board
- RoHS Compliant



SPECIFICATIONS

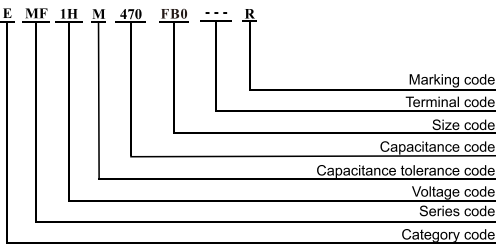
Items	Characteristics								
Category Temperature Range	-55 ~ +105°C								
Rated Voltage Range	6.3 ~ 100 V _{dc}								
Capacitance Tolerance	±20% (M) (at 20°C,120Hz)								
Leakage Current	6.3 ~ 100 V _{dc}				(at 20°C)				
	I≤0.01CV or 3μA, whichever is greater (2 minutes)								
	Where, I:Max. leakage current (μA), C:Nominal capacitance (μF), V:Rated voltage (V)								
Dissipation Factor (tanδ)	Rated Voltage (V _{dc})	6.3	10	16	25	35~50	63~80	100	(at 20°C,120Hz)
	Dissipation Factor(Max.)	0.32	0.28	0.26	0.16	0.14	0.12	0.10	
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (V _{dc})	6.3	10	16	25	35~50	63~80	100	(at 120Hz)
	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	2	
	Z(-40°C)/Z(+20°C)	6	4	3	3	3	3	3	
	Z(-55°C)/Z(+20°C)	8	6	4	3	3	3	3	
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after rated voltage is applied for a specified period of time at 105°C.								
	Rated Voltage (V _{dc})	6.3 ~ 100							
	Load Life	5,000 hours							
	Capacitance Change	±30% of the initial value							
	Dissipation Factor	≤300% of the initial specified value							
	Leakage Current	≤The initial specified value							
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.								
	Rated Voltage (V _{dc})	6.3 ~ 100							
	Capacitance Change	±30% of the initial value							
	Dissipation Factor	≤300% of the initial specified value							
	Leakage Current	≤ 200% of the initial specified value							

DIMENSIONS [mm]



Size code	D	L	A	B	C	W	P
FB0	8.0	10.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
GB0	10.0	10.5	10.3	10.3	11.0	0.7 ~ 1.1	4.5
GD0	10.0	12.5	10.3	10.3	11.0	0.7 ~ 1.1	4.5
WE0	12.5	13.5	13.0	13.0	13.7	1.0 ~ 1.3	4.5
WG5	12.5	16.0	13.0	13.0	13.7	1.0 ~ 1.3	4.5

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current				
Freq. (Hz)	120	1K	10K	100K
Cap. (μF)				
22 ≤Cap. ≤1,000	0.50	0.80	0.90	1.00

MF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size Code	Rated Ripple Current (mA rms/105°C, 100kHz)	Part Number
6.3	330	FB0	280	EMF0JM331FB0---R
	470	FB0	360	EMF0JM471FB0---R
	560	FB0	380	EMF0JM561FB0---R
	680	GB0	500	EMF0JM681GB0---R
	1,000	GB0	600	EMF0JM102GB0---R
10	220	FB0	280	EMF1AM221FB0---R
	330	GB0	400	EMF1AM331GB0---R
	470	GB0	545	EMF1AM471GB0---R
	680	GB0	560	EMF1AM681GB0---R
	1000	WE0	850	EMF1AM102WE0---R
16	220	FB0	475	EMF1CM221FB0---R
	330	GB0	520	EMF1CM331GB0---R
	470	GB0	720	EMF1CM471GB0---R
	680	WE0	960	EMF1CM681WE0---R
	1,000	WE0	1,030	EMF1CM102WE0---R
25	220	FB0	535	EMF1EM221FB0---R
	330	GB0	750	EMF1EM331GB0---R
	470	GB0	750	EMF1EM471GB0---R
	680	WE0	1000	EMF1EM681WE0---R
	1,000	WG5	1,300	EMF1EM102WG5---R
35	100	FB0	560	EMF1VM101FB0---R
	220	GB0	800	EMF1VM221GB0---R
	330	GB0	850	EMF1VM331GB0---R
	470	WE0	900	EMF1VM471WE0---R
	560	WE0	960	EMF1VM561WE0---R
50	680	WG5	1,600	EMF1VM681WG5---R
	47	FB0	520	EMF1HM470FB0---R
	100	FB0	350	EMF1HM101FB0---R
	100	GB0	680	EMF1HM101GB0---R
	220	GD0	760	EMF1HM221GD0---R
63	220	WE0	875	EMF1HM221WE0---R
	330	WG5	1,020	EMF1HM331WG5---R
	470	WG5	1,120	EMF1HM471WG5---R
80	33	FB0	320	EMF1JM330FB0---R
	47	FB0	380	EMF1JM470FB0---R
	100	GB0	530	EMF1JM101GB0---R
	220	WE0	840	EMF1JM221WE0---R
	330	WG5	920	EMF1JM331WG5---R
100	22	FB0	360	EMF1BM220FB0---R
	33	FB0	410	EMF1BM330FB0---R
	47	GB0	490	EMF1BM470GB0---R
	100	GD0	530	EMF1BM101GD0---R
	220	WG5	1,020	EMF1BM221WG5---R
150	22	FB0	320	EMF1KM220FB0---R
	33	GB0	360	EMF1KM330GB0---R
	47	GB0	540	EMF1KM470GB0---R
	100	WE0	550	EMF1KM101WE0---R
	150	WG5	900	EMF1KM151WG5---R

※Specifications subject to change without notice

MH series

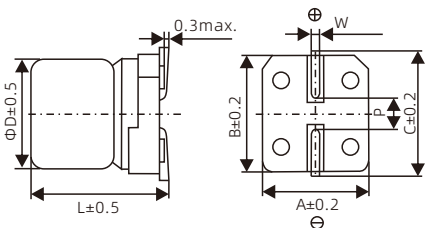
- Endurance: 1,000~3,000 hours at 125°C
- High temperature 125°C
- Designed for surface mounting on high density PC board
- RoHS Compliant



SPECIFICATIONS

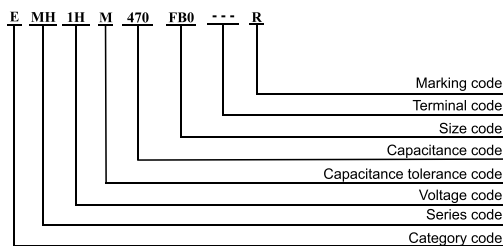
Items	Characteristics							
Category Temperature Range	-55 ~ +125℃							
Rated Voltage Range	10~ 100 V _{dc}							
Capacitance Tolerance	±20% (M) (at 20℃,120Hz)							
Leakage Current	10~ 100 V _{dc}					(at 20℃)		
	E83~GB0		WE0~WG5					
	I≤0.01CV or 3μA, whichever is greater (2 minutes)		I≤0.03CV or 4μA, whichever is greater (2 minutes)					
	Where, I:Max. leakage current (μA), C:Nominal capacitance (μF), V:Rated voltage (V)							
Dissipation Factor (tanδ)	Rated Voltage (V _{dc})	10	16	25	35~50	63~80	100	(at 20℃,120Hz)
	Dissipation Factor(Max.)	0.24	0.20	0.16	0.14	0.12	0.10	
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.							
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (V _{dc})		10	16	25	35~50	63~100	(at 120Hz)
	E83~GB0	Z(-25℃)/Z(+20℃)	3	2	2	2	2	
		Z(-40℃)/Z(+20℃)	6	4	4	3	3	
		Z(-55℃)/Z(+20℃)	6	4	4	3	-	
	WE0~WG5	Z(-25℃)/Z(+20℃)	4	3	2	2	2	
		Z(-40℃)/Z(+20℃)	6	6	4	3	3	
		Z(-55℃)/Z(+20℃)	6	6	4	3	-	
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20℃ after rated voltage is applied for a specified period of time at 125℃.							
	Load Life	E83 : 1,000 hours FB0~GB0 : 2,000 hours WE0~WG5 : 3,000 hours						
	Capacitance Change	≤±30% of the initial value						
	Dissipation Factor	≤300% of the initial specified value						
	Leakage Current	≤The initial specified value						
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after leaving them under no load at 125℃ for 1,000 hours							
	Capacitance Change	≤±30% of the initial value						
	Dissipation Factor	≤300% of the initial specified value						
	Leakage Current	≤ 500% of the initial specified value						

DIMENSIONS [mm]



Size code	D	L	A	B	C	W	P
E83	6.3	8.0	6.6	6.6	7.2	0.5 ~ 0.8	1.9
FB0	8.0	10.5	8.3	8.3	9.0	0.7 ~ 1.1	3.1
GB0	10.0	10.5	10.3	10.3	11.0	0.7 ~ 1.1	4.5
WE0	12.5	13.5	13.0	13.0	13.7	1.0 ~ 1.3	4.5
WG5	12.5	16.0	13.0	13.0	13.7	1.0 ~ 1.3	4.5

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	120	1k	10k	100k
Cap. < 220	0.40	0.75	0.90	1.00
220 ≤ Cap. < 680	0.50	0.85	0.94	1.00
680 ≤ Cap. < 1,000	0.60	0.87	0.95	1.00

MH series

STANDARD RATINGS

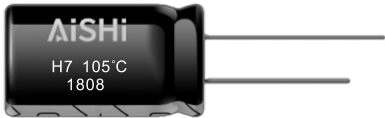
WV (Vdc)	Cap (μF)	Size Code	Rated Ripple Current (mA rms/125°C, 100kHz)	Part Number
10	100	E83	110	EMH1AM101E83--R
	220	E83	110	EMH1AM221E83--R
	220	FB0	220	EMH1AM221FB0--R
	330	FB0	220	EMH1AM331FB0--R
	330	GB0	296	EMH1AM331GB0--R
	470	GB0	296	EMH1AM471GB0--R
	1,000	WE0	750	EMH1AM102WE0--R
16	100	E83	110	EMH1CM101E83--R
	100	FB0	220	EMH1CM101FB0--R
	220	FB0	220	EMH1CM221FB0--R
	330	GB0	296	EMH1CM331GB0--R
	470	GB0	310	EMH1CM471GB0--R
	680	WE0	750	EMH1CM681WE0--R
25	1,000	WG5	800	EMH1CM102WG5--R
	47	E83	110	EMH1EM470E83--R
	100	E83	110	EMH1EM101E83--R
	100	FB0	220	EMH1EM101FB0--R
	220	FB0	220	EMH1EM221FB0--R
	220	GB0	296	EMH1EM221GB0--R
	330	GB0	296	EMH1EM331GB0--R
	470	WE0	750	EMH1EM471WE0--R
35	680	WG5	800	EMH1EM681WG5--R
	33	E83	110	EMH1VM330E83--R
	47	E83	110	EMH1VM470E83--R
	100	FB0	220	EMH1VM101FB0--R
	220	GB0	296	EMH1VM221GB0--R
	330	WE0	750	EMH1VM331WE0--R
50	470	WG5	900	EMH1VM471WG5--R
	10	E83	83	EMH1HM100E83--R
	22	E83	83	EMH1HM220E83--R
	33	E83	83	EMH1HM330E83--R
	47	FB0	160	EMH1HM470FB0--R
	47	GB0	247	EMH1HM470GB0--R
	100	GB0	247	EMH1HM101GB0--R
	100	WE0	550	EMH1HM101WE0--R
63	220	WE0	550	EMH1HM221WE0--R
	330	WG5	700	EMH1HM331WG5--R
	22	E83	65	EMH1JM220E83--R
	33	FB0	100	EMH1JM330FB0--R
	47	FB0	125	EMH1JM470FB0--R
	100	GB0	205	EMH1JM101GB0--R
80	220	WG5	600	EMH1JM221WG5--R
	10	E83	95	EMH1BM100E83--R
	22	FB0	110	EMH1BM220FB0--R
	22	GB0	215	EMH1BM220GB0--R
	33	FB0	130	EMH1BM330FB0--R
	47	GB0	245	EMH1BM470GB0--R
100	100	WE0	475	EMH1BM101WE0--R
	10	E83	90	EMH1KM100E83--R
	22	FB0	105	EMH1KM220FB0--R
	33	GB0	200	EMH1KM330GB0--R
	47	GB0	230	EMH1KM470GB0--R

WV (Vdc)	Cap (μF)	Size Code	Rated Ripple Current (mA rms/125°C, 100kHz)	Part Number
100	68	WE0	375	EMH1KM680WE0--R
	100	WE0	405	EMH1KM101WE0--R

※Specifications subject to change without notice

H7 series

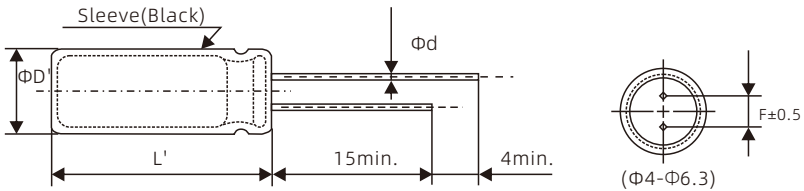
- Endurance: 1,000 hours at 105°C
- Miniature series with 7mm height
- Wide temperature range of -40°C to +105°C
- RoHS Compliant



SPECIFICATIONS

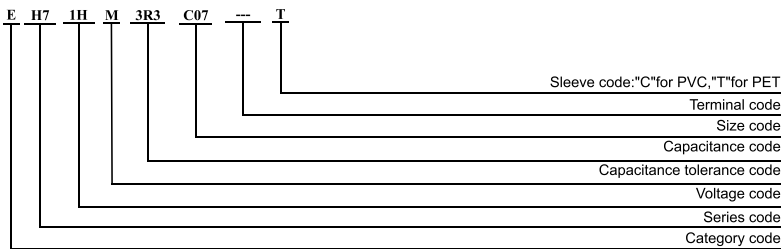
Items	Characteristics							
Category Temperature Range	-40~+105°C							
Rated Working Voltage Range	6.3~50 Vdc							
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)							
Leakage Current	I ≤0.01CV or 3μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)							
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	10	16	25	35	50	(at 20°C,120Hz)
	tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	(at 120Hz)
	Z(-25°C)/Z(+20°C)	3		2				
	Z(-40°C)/Z(+20°C)	8	5	4	3			
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hours at 105°C.							
	Capacitance Change	≤±20% of the initial value						
	Dissipation Factor	≤200% of the initial specified value						
	Leakage Current	≤The initial specified value						
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied.							
	Capacitance Change	≤±20% of the initial value						
	Dissipation Factor	≤200% of the initial specified value						
	Leakage Current	≤200% of the initial specified value						

DIMENSIONS [mm]



ΦD	4	5	6.3
Φd	0.45	0.45	0.5
F	1.5	2.0	2.5
ΦD'	ΦD+0.5MAX.		
L'	L+1.5MAX.		

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

WV (Vdc)	Freq. (Hz)			
	50/60	120	1k	10~100k
6.3 to 16	0.94	1.00	1.28	1.39
25 to 35	0.76	1.00	1.27	1.59
50	0.90	1.00	1.40	2.00

H7 series

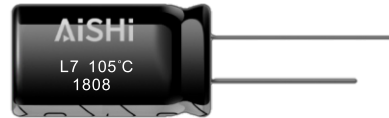
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
6.3	22	4×7	34	EH70JM220C07---T
	33	5×7	42	EH70JM330D07---T
	47	5×7	50	EH70JM470D07---T
	100	6.3×7	77	EH70JM101E07---T
10	22	5×7	38	EH71AM220D07---T
	33	5×7	47	EH71AM330D07---T
	47	6.3×7	65	EH71AM470E07---T
	100	6.3×7	87	EH71AM101E07---T
16	10	4×7	29	EH71CM100C07---T
	22	5×7	44	EH71CM220D07---T
	33	6.3×7	60	EH71CM330E07---T
	47	6.3×7	70	EH71CM470E07---T
25	10	5×7	33	EH71EM100D07---T
	22	6.3×7	51	EH71EM220E07---T
	33	6.3×7	65	EH71EM330E07---T
35	10	5×7	36	EH71VM100D07---T
	22	6.3×7	60	EH71VM220E07---T
50	0.1	4×7	1	EH71HMR10C07---T
	0.22	4×7	2.3	EH71HMR22C07---T
	0.33	4×7	3.5	EH71HMR33C07---T
	0.47	4×7	5	EH71HMR47C07---T
	1	4×7	10	EH71HM010C07---T
	2.2	4×7	19	EH71HM2R2C07---T
	3.3	4×7	24	EH71HM3R3C07---T
	4.7	5×7	29	EH71HM4R7D07---T
	10	6.3×7	44	EH71HM100E07---T
	22	6.3×7	60	EH71HM220E07---T

※Specifications subject to change without notice

L7 series

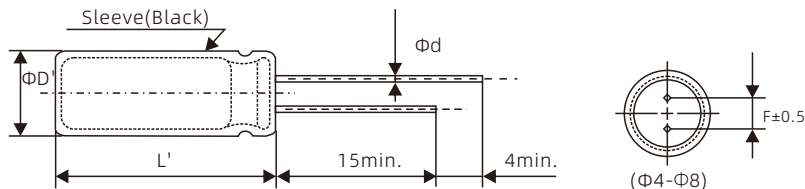
- Endurance: 2,000 hours at 105°C
- Miniature series with 7mm height
- Wide temperature range of -40°C to +105°C
- RoHS Compliant



SPECIFICATIONS

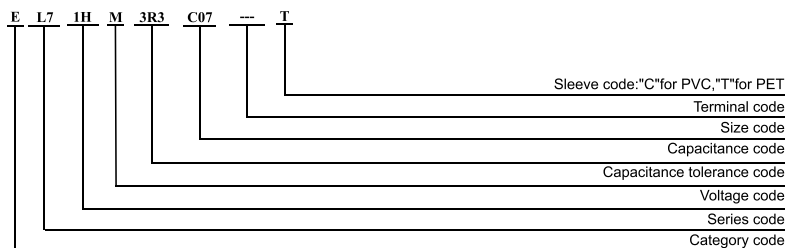
Items	Characteristics											
Category Temperature Range	-40~+105°C											
Rated Working Voltage Range	6.3~63 Vdc											
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)											
Leakage Current	I ≤ 0.01CV or 3μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)											
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	(at 20°C,120Hz)			
	tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09				
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	(at 120Hz)			
	Z(-25°C)/Z(+20°C)	3		2								
	Z(-40°C)/Z(+20°C)	8	6	4	3							
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C.											
	Capacitance Change	≤±20% of the initial value										
	Dissipation Factor	≤200% of the initial specified value										
	Leakage Current	≤The initial specified value										
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1000 hours at 105°C without voltage applied.											
	Capacitance Change	≤±20% of the initial value										
	Dissipation Factor	≤200% of the initial specified value										
	Leakage Current	≤200% of the initial specified value										

DIMENSIONS [mm]



ΦD	4	5	6.3	8
Φd	0.45	0.45	0.5	0.5
F	1.5	2.0	2.5	3.5
ΦD'	ΦD+0.5MAX.			
L'	L+2MAX.			

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

WV (Vdc)	Freq. (Hz)			
	50/60	120	1k	10~100k
6.3 to 16	0.80	1.00	1.30	1.50
25 to 35	0.80	1.00	1.20	1.20
≥50	0.80	1.00	1.15	1.20

L7 series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
6.3	22	4×7	28	EL70JM220C07---T
	33	4×7	32	EL70JM330C07---T
	33	5×7	35	EL70JM330D07---T
	47	5×7	47	EL70JM470D07---T
	68	5×7	50	EL70JM680D07---T
	100	6.3×7	75	EL70JM101E07---T
	220	8×7	92	EL70JM221F07---T
10	22	4×7	32	EL71AM220C07---T
	33	5×7	48	EL71AM330D07---T
	47	5×7	51	EL71AM470D07---T
	68	6.3×7	68	EL71AM680E07---T
	100	6.3×7	80	EL71AM101E07---T
	100	8×7	95	EL71AM101F07---T
16	10	4×7	28	EL71CM100C07---T
	22	4×7	35	EL71CM220C07---T
	22	5×7	42	EL71CM220D07---T
	33	5×7	50	EL71CM330D07---T
	47	6.3×7	67	EL71CM470E07---T
	68	6.3×7	70	EL71CM680E07---T
	68	8×7	78	EL71CM680F07---T
	100	8×7	110	EL71CM101F07---T
25	10	4×7	28	EL71EM100C07---T
	10	5×7	33	EL71EM100D07---T
	22	5×7	43	EL71EM220D07---T
	22	6.3×7	45	EL71EM220E07---T
	33	6.3×7	62	EL71EM330E07---T
	47	8×7	75	EL71EM470F07---T
	68	8×7	80	EL71EM680F07---T
	100	8×7	115	EL71EM101F07---T
35	10	5×7	35	EL71VM100D07---T
	22	6.3×7	60	EL71VM220E07---T
	33	6.3×7	50	EL71VM330E07---T
	33	8×7	68	EL71VM330F07---T
	47	8×7	80	EL71VM470F07---T
	68	8×7	85	EL71VM680F07---T
50	0.1	4×7	1.5	EL71HMR10C07---T
	0.22	4×7	2.5	EL71HMR22C07---T
	0.33	4×7	3.5	EL71HMR33C07---T
	0.47	4×7	5	EL71HMR47C07---T
	0.68	4×7	7	EL71HMR68C07---T
	1	4×7	10	EL71HM010C07---T
	2.2	4×7	20	EL71HM2R2C07---T
	3.3	4×7	26	EL71HM3R3C07---T
	4.7	4×7	27	EL71HM4R7C07---T
	4.7	5×7	29	EL71HM4R7D07---T
	10	6.3×7	38	EL71HM100E07---T
	22	8×7	63	EL71HM220F07---T
63	0.1	4×7	1.5	EL71JMR10C07---T
	0.22	4×7	2.5	EL71JMR22C07---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
63	0.33	4×7	3.5	EL71JMR33C07---T
	0.47	4×7	6	EL71JMR47C07---T
	1	4×7	12	EL71JM010C07---T
	2.2	4×7	20	EL71JM2R2C07---T
	3.3	5×7	28	EL71JM3R3D07---T
	4.7	6.3×7	33	EL71JM4R7E07---T
	10	6.3×7	40	EL71JM100E07---T
	22	8×7	65	EL71JM220F07---T

※Specifications subject to change without notice

WKseries

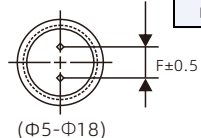
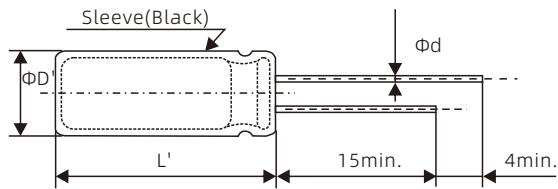
- Endurance: 2,000 hours at 85°C
- Standard series for general purpose
- RoHS Compliant



SPECIFICATIONS

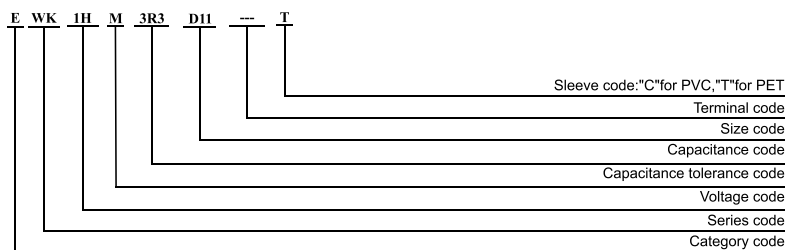
Items	Characteristics															
Category Temperature Range	-40 to +85°C (6.3 ~ 100Vdc) -25 to +85°C (160 ~ 450Vdc)															
Rated Working Voltage Range	6.3~450 Vdc															
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)															
Leakage Current	6.3 ~ 100 Vdc	160 ~ 450 Vdc		Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)												
	I ≤ 0.01CV or 3μA, whichever is greater.	I ≤ 0.03CV+10μA														
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	
	tanδ (max.)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.20	0.20	0.20	0.24	0.24	0.24	
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000 μF increase. (at 20°C, 120Hz)															
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	(at 120Hz)
	Z(-25°C)/Z(+20°C)	5	4	3	2					3			6			
	Z(-40°C)/Z(+20°C)	12	10	8	5	4	3			-			-			
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C.															
	Capacitance Change	≤±20% of the initial value														
	Dissipation Factor	≤200% of the initial specified value														
	Leakage Current	≤The initial specified value														
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1000 hours at 85°C without voltage applied.															
	Capacitance Change	≤±20% of the initial value														
	Dissipation Factor	≤200% of the initial specified value														
	Leakage Current	≤200% of the initial specified value														

DIMENSIONS [mm]



ΦD	5	6.3	8		10	12.5	16	18
Φd	0.5	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	3.5	5.0	5.0	7.5	7.5
ΦD'	ΦD+0.5MAX.							
L'	L+2MAX.							

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Freq. (Hz)	50	120	300	1k	10	100k
Cap. < 10	0.65	1.00	1.35	1.75	2.30	2.50
10sCap. < 100	0.75	1.00	1.25	1.50	1.75	1.80
100sCap. ≤ 1,000	0.80	1.00	1.15	1.30	1.40	1.50
Cap. > 1,000	0.85	1.00	1.03	1.05	1.08	1.08

WKseries

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/85°C, 120Hz)	Part Number
6.3	33	5×11	65	EWK0JM330D11---T
	47	5×11	80	EWK0JM470D11---T
	100	5×11	135	EWK0JM101D11---T
	220	5×12	220	EWK0JM221D12---T
	330	6.3×11	280	EWK0JM331E11---T
	470	6.3×12	360	EWK0JM471E12---T
	1,000	8×12	590	EWK0JM102F12---T
	2,200	10×20	1,000	EWK0JM222G20---T
	3,300	10×25	1,200	EWK0JM332G25---T
	4,700	12.5×20	1,550	EWK0JM472W20---T
	6,800	12.5×25	1,920	EWK0JM682W25---T
	10,000	16×25	2,370	EWK0JM103L25---T
	15,000	16×35	2,880	EWK0JM153L35---T
	22,000	18×40	3,350	EWK0JM223M40---T
10	22	5×11	60	EWK1AM220D11---T
	33	5×11	75	EWK1AM330D11---T
	47	5×11	95	EWK1AM470D11---T
	100	5×11	140	EWK1AM101D11---T
	220	5×12	240	EWK1AM221D12---T
	330	6.3×11	310	EWK1AM331E11---T
	470	6.3×12	400	EWK1AM471E12---T
	1,000	10×13	660	EWK1AM102G13---T
	2,200	10×20	1,090	EWK1AM222G20---T
	3,300	12.5×20	1,450	EWK1AM332W20---T
	4,700	12.5×25	1,800	EWK1AM472W25---T
	6,800	16×25	2,250	EWK1AM682L25---T
	10,000	16×35	2,710	EWK1AM103L35---T
	15,000	18×35	3,120	EWK1AM153M35---T
16	10	5×11	50	EWK1CM220D11---T
	22	5×11	65	EWK1CM330D11---T
	33	5×11	80	EWK1CM470D11---T
	47	5×11	115	EWK1CM101D11---T
	100	5×11	175	EWK1CM221E11---T
	220	6.3×11	280	EWK1CM331F11---T
	330	8×11	380	EWK1CM471F11---T
	470	8×11	460	EWK1CM102G16---T
	1,000	10×16	800	EWK1CM222W20---T
	2,200	12.5×20	1,320	EWK1CM332W25---T
	3,300	12.5×25	1,670	EWK1CM472L30---T
	4,700	16×25	2,120	EWK1CM682L30---T
	6,800	16×30	2,550	EWK1CM100D11---T
	10	5×11	45	EWK1EM100D11---T
25	22	5×11	70	EWK1EM220D11---T
	33	5×11	98	EWK1EM330D11---T
	47	5×11	120	EWK1EM470D11---T
	100	6.3×11	190	EWK1EM101E11---T
	220	8×11	330	EWK1EM221F11---T
	330	8×12	440	EWK1EM331F12---T
	470	10×13	550	EWK1EM471G13---T
	1,000	10×20	970	EWK1EM102G20---T
	2,200	12.5×25	1,570	EWK1EM222W25---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/85°C, 120Hz)	Part Number
25	3,300	16×25	2,000	EWK1EM332L25---T
	4,700	16×30	2,450	EWK1EM472L30---T
35	10	5×11	55	EWK1VM100D11---T
	22	5×11	90	EWK1VM220D11---T
	33	5×11	110	EWK1VM330D11---T
	47	5×11	135	EWK1VM470D11---T
	100	6.3×11	215	EWK1VM101E11---T
	220	8×12	385	EWK1VM221F12---T
	330	10×13	500	EWK1VM331G13---T
	470	10×16	680	EWK1VM471G16---T
	1,000	12.5×20	1,180	EWK1VM102W20---T
	2,200	16×25	1,810	EWK1VM222L25---T
50	3,300	16×35	2,300	EWK1VM332L35---T
	4,700	18×35	2,750	EWK1VM472M35---T
	0.1	5×11	1.3	EWK1HMR10D11---T
	0.22	5×11	2.9	EWK1HMR22D11---T
	0.33	5×11	4.3	EWK1HMR33D11---T
	0.47	5×11	7	EWK1HMR47D11---T
	1	5×11	17	EWK1HM010D11---T
	2.2	5×11	28	EWK1HM2R2D11---T
	3.3	5×11	35	EWK1HM3R3D11---T
	4.7	5×11	41	EWK1HM4R7D11---T
63	10	5×11	60	EWK1HM100D11---T
	22	5×11	95	EWK1HM220D11---T
	33	6.3×11	130	EWK1HM330E11---T
	47	6.3×11	160	EWK1HM470E11---T
	100	8×11	270	EWK1HM101F11---T
	220	10×16	435	EWK1HM221G16---T
	330	10×20	590	EWK1HM331G20---T
	470	10×20	760	EWK1HM471G20---T
	1,000	12.5×25	1,350	EWK1HM102W25---T
	2,200	16×35	2,110	EWK1HM222L35---T
100	3,300	18×35	2,550	EWK1HM332M35---T
	4.7	5×11	45	EWK1JM4R7D11---T
	10	5×11	70	EWK1JM100D11---T
	22	6.3×11	110	EWK1JM220E11---T
	33	6.3×11	140	EWK1JM330E11---T
	47	6.3×12	190	EWK1JM470E12---T
	100	10×13	300	EWK1JM101G13---T
	220	10×16	490	EWK1JM221G16---T
	330	10×20	710	EWK1JM331G20---T
	470	12.5×20	900	EWK1JM471W20---T

WKseries

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /85°C, 120Hz)	Part Number
100	4.7	5×11	50	EWK1KM4R7D11---T
	10	6.3×11	75	EWK1KM100E11---T
	22	8×11	135	EWK1KM220F11---T
	33	8×12	185	EWK1KM330F12---T
	47	10×13	235	EWK1KM470G13---T
	100	10×20	380	EWK1KM101G20---T
	220	12.5×25	630	EWK1KM221W25---T
	330	12.5×30	760	EWK1KM331W30---T
	470	16×30	1,000	EWK1KM471L30---T
	1,000	18×40	1,350	EWK1KM102M40---T
160	0.47	6.3×11	10	EWK2CMR47E11---T
	1	6.3×11	15	EWK2CM010E11---T
	2.2	6.3×11	30	EWK2CM2R2E11---T
	3.3	6.3×11	40	EWK2CM3R3E11---T
	4.7	6.3×11	48	EWK2CM4R7E11---T
	10	8×12	80	EWK2CM100F12---T
	10	10×12	94	EWK2CM100G12---T
	22	10×12	130	EWK2CM220G12---T
	22	10×16	150	EWK2CM220G16---T
	22	10×20	170	EWK2CM220G20---T
	33	10×16	180	EWK2CM330G16---T
	33	10×20	210	EWK2CM330G20---T
	47	10×20	240	EWK2CM470G20---T
	47	12.5×20	280	EWK2CM470W20---T
	68	12.5×20	360	EWK2CM680W20---T
	100	12.5×25	470	EWK2CM101W25---T
	150	16×20	520	EWK2CM151L20---T
	180	16×25	600	EWK2CM181L25---T
	220	16×30	780	EWK2CM221L30---T
	270	18×30	860	EWK2CM271M30---T
200	330	18×35	1,000	EWK2CM331M35---T
	390	18×35	1,020	EWK2CM391M35---T
	470	18×40	1,220	EWK2CM471M40---T
	0.47	6.3×11	10	EWK2DMR47E11---T
	1	6.3×11	15	EWK2DM010E11---T
	2.2	6.3×11	34	EWK2DM2R2E11---T
	3.3	6.3×11	45	EWK2DM3R3E11---T
	4.7	6.3×11	55	EWK2DM4R7E11---T
	4.7	8×12	60	EWK2DM4R7F12---T
	10	10×12	100	EWK2DM100G12---T
	22	10×20	170	EWK2DM220G20---T
	33	10×20	205	EWK2DM330G20---T
	47	12.5×20	270	EWK2DM470W20---T
	68	12.5×25	370	EWK2DM680W25---T
	100	16×25	475	EWK2DM101L25---T
	150	16×25	550	EWK2DM151L25---T
	180	18×25	620	EWK2DM181M25---T
	220	18×35	810	EWK2DM221M35---T
	270	18×35	870	EWK2DM271M35---T
	330	18×35	1,000	EWK2DM331M35---T
	330	18×40	1,020	EWK2DM331M40---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /85°C, 120Hz)	Part Number
250	0.47	6.3×11	10	EWK2EMR47E11---T
	1	6.3×11	16	EWK2EM010E11---T
	2.2	6.3×11	34	EWK2EM2R2E11---T
	3.3	6.3×11	42	EWK2EM3R3E11---T
	3.3	8×12	46	EWK2EM3R3F12---T
	4.7	6.3×11	50	EWK2EM4R7E11---T
	4.7	8×12	55	EWK2EM4R7F12---T
	10	10×12	100	EWK2EM100G12---T
	10	10×16	105	EWK2EM100G16---T
	22	10×20	170	EWK2EM220G20---T
	33	10×20	200	EWK2EM330G20---T
	33	12.5×20	230	EWK2EM330W20---T
	47	12.5×20	270	EWK2EM470W20---T
	47	12.5×25	295	EWK2EM470W25---T
	68	16×25	382	EWK2EM680L25---T
	100	16×25	450	EWK2EM101L25---T
	100	16×30	515	EWK2EM101L30---T
	120	16×30	530	EWK2EM121L30---T
	150	16×30	570	EWK2EM151L30---T
	180	18×30	620	EWK2EM181M30---T
350	0.47	6.3×11	15	EWK2VMR47E11---T
	1	6.3×11	22	EWK2VM010E11---T
	2.2	8×12	38	EWK2VM2R2F12---T
	3.3	8×12	46	EWK2VM3R3F12---T
	4.7	10×12	65	EWK2VM4R7G12---T
	10	10×12	90	EWK2VM100G12---T
	10	10×16	100	EWK2VM100G16---T
	10	10×20	120	EWK2VM100G20---T
	22	12.5×20	185	EWK2VM220W20---T
	33	16×25	275	EWK2VM330L25---T
400	47	16×25	325	EWK2VM470L25---T
	68	16×25	405	EWK2VM680L25---T
	100	18×30	530	EWK2VM101M30---T
	1	6.3×11	22	EWK2GM010E11---T
	2.2	8×12	38	EWK2GM2R2F12---T
	3.3	10×12	54	EWK2GM3R3G12---T
	4.7	10×12	60	EWK2GM4R7G12---T
	4.7	10×16	75	EWK2GM4R7G16---T
	10	10×16	100	EWK2GM100G16---T
	10	10×20	120	EWK2GM100G20---T
450	22	12.5×25	205	EWK2GM220W25---T
	33	16×25	275	EWK2GM330L25---T
	47	16×25	325	EWK2GM470L25---T
	47	16×30	350	EWK2GM470L30---T
	56	16×30	385	EWK2GM560L30---T
	68	18×25	420	EWK2GM680M25---T
	82	18×30	475	EWK2GM820M30---T
	100	18×35	545	EWK2GM101M35---T
	1	8×12	16	EWK2WM010F12---T
	2.2	8×12	32	EWK2WM2R2F12---T
450	2.2	10×12	35	EWK2WM2R2G12---T

WKseries

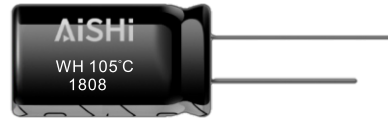
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /85°C, 120Hz)	Part Number
450	3.3	10×12	40	EWK2WM3R3G12---T
	3.3	10×16	44	EWK2WM3R3G16---T
	4.7	10×12	50	EWK2WM4R7G12---T
	4.7	10×16	58	EWK2WM4R7G16---T
	4.7	10×20	65	EWK2WM4R7G20---T
	10	10×20	80	EWK2WM100G20---T
	10	12.5×20	92	EWK2WM100W20---T
	22	12.5×25	150	EWK2WM220W25---T
	22	16×25	165	EWK2WM220L25---T
	33	16×30	215	EWK2WM330L30---T
	47	16×30	260	EWK2WM470L30---T
	47	16×35	280	EWK2WM470L35---T
	68	18×30	370	EWK2WM680M30---T
	82	18×35	390	EWK2WM820M35---T
	100	18×40	420	EWK2WM101M40---T

※Specifications subject to change without notice

WHseries

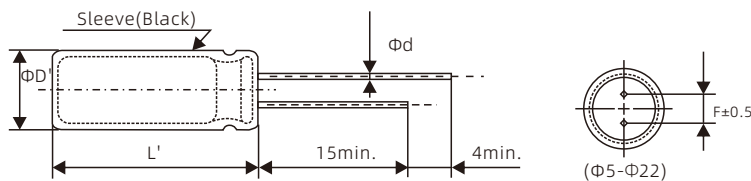
- Endurance: 2,000 hours at 105°C
- Wide temperature range from -40°C to +105°C
- Standard series for general purpose
- RoHS Compliant



SPECIFICATIONS

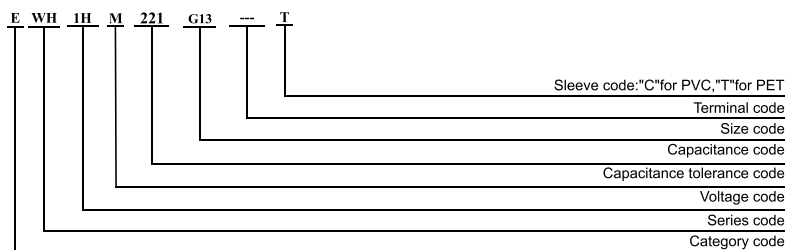
Items	Characteristics													
Category Temperature Range	-40~+105°C(6.3~100Vdc)						-25~+105°C(160~500Vdc)							
Rated Voltage Range	6.3~500Vdc													
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)													
Leakage Current	6.3 to 100Vdc I ≤0.03CV or 4μA(at 1 minute) I ≤0.01CV or 3μA(at 2 minutes) whichever is greater				160~500Vdc						I: leakage current(μA), C: Nominal capacitance(μF) V: Rated voltage(V) (at 20°C)			
					CV		After 1 minute		After 5 minutes					
					CV≤1,000		I ≤0.1CV+40μAI		I ≤0.03CV+15μA					
					CV > 1,000		I ≤0.04CV+100μA		I ≤0.02CV+25μA					
Dissipation Factor (tanδ)	Rated Voltage (Vdc)		6.3	10	16	25	35	50	63	100	160~250	350~450	(at 20°C, 120Hz)	
	Dissipation Factor(Max.)		0.28	0.24	0.20	0.18	0.16	0.14	0.12	0.10	0.20	0.24		
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.													
Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage (Vdc)		6.3	10	16	25	35	50	63	100	160~250	350~450	500	(120Hz)
	Z(-25°C)/ Z(+20°C)		5	4	3	2				3		6	8	
	Z(-40°C)/ Z(+20°C)		12	10	8	5	4	3			-			
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for 2,000 hours at 105°C.													
	Capacitance Change		≤±20% of the initial value											
	Dissipation Factor		≤200% of the initial specified value											
	Leakage Current		≤The initial specified value											
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.													
	Capacitance Change		≤±20% of the initial value											
	Dissipation Factor		≤200% of the initial specified value											
	Leakage Current		≤200% of the initial specified value											

DIMENSIONS [mm]



ΦD	5	6.3	8	10	12.5/13	16/18	20	22※
Φd	0.5	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	10	10
ΦD'	ΦD+0.5max.							
L'	L+2max.							
※	22×55/22×60 Φd=1.0, L'=L+3max.							

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Freq. (Hz)	50	120	300	1k	10	100k
Cap. (μF)						
Cap. < 10	0.65	1.00	1.35	1.75	2.30	2.50
10sCap. < 100	0.75	1.00	1.25	1.50	1.75	1.80
100sCap. < 1,000	0.80	1.00	1.15	1.30	1.40	1.50
Cap. ≥ 1,000	0.85	1.00	1.03	1.05	1.08	1.08

WHseries

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	Part Number
6.3	33	5×11	54	EWHOJM330D11 ---T
	47	5×11	64	EWHOJM470D11 ---T
	100	5×11	94	EWHOJM101D11 ---T
	220	5×11	140	EWHOJM221D11 ---T
	330	6.3×11	190	EWHOJM331E11 ---T
	470	6.3×11	230	EWHOJM471E11 ---T
	1,000	8×12	380	EWHOJM102F12 ---T
	2,200	10×20	710	EWHOJM222G20 ---T
	3,300	10×20	840	EWHOJM332G20 ---T
	4,700	12.5×20	1,090	EWHOJM472W20 ---T
	6,800	12.5×25	1,350	EWHOJM682W25 ---T
	10,000	16×25	1,650	EWHOJM103L25 ---T
10	22	5×11	46	EWHA1AM220D11 ---T
	33	5×11	57	EWHA1AM330D11 ---T
	47	5×11	68	EWHA1AM470D11 ---T
	100	5×11	100	EWHA1AM101D11 ---T
	220	6.3×11	170	EWHA1AM221E11 ---T
	330	6.3×11	200	EWHA1AM331E11 ---T
	470	8×11	250	EWHA1AM471F11 ---T
	1,000	10×13	460	EWHA1AM102G13 ---T
	2,200	10×20	760	EWHA1AM222G20 ---T
	3,300	12.5×20	1,000	EWHA1AM332W20 ---T
	4,700	12.5×25	1,260	EWHA1AM472W25 ---T
	6,800	16×25	1,570	EWHA1AM682L25 ---T
16	10	5×11	34	EWHA1CM100D11 ---T
	22	5×11	51	EWHA1CM220D11 ---T
	33	5×11	63	EWHA1CM330D11 ---T
	47	5×11	75	EWHA1CM470D11 ---T
	100	5×11	110	EWHA1CM101D11 ---T
	220	6.3×11	180	EWHA1CM221E11 ---T
	330	8×11	260	EWHA1CM331F11 ---T
	470	8×12	310	EWHA1CM471F12 ---T
	1,000	10×16	560	EWHA1CM102G16 ---T
	2,200	12.5×20	920	EWHA1CM222W20 ---T
	3,300	12.5×25	1,170	EWHA1CM332W25 ---T
	4,700	16×25	1,480	EWHA1CM472L25 ---T
25	4.7	5×11	25	EWHE1EM4R7D11 ---T
	10	5×11	36	EWHE1EM100D11 ---T
	22	5×11	54	EWHE1EM220D11 ---T
	33	5×11	67	EWHE1EM330D11 ---T
	47	5×11	80	EWHE1EM470D11 ---T
	100	6.3×11	130	EWHE1EM101E11 ---T
	220	8×11	230	EWHE1EM221F11 ---T
	330	8×12	310	EWHE1EM331F12 ---T
	470	10×13	380	EWHE1EM471G13 ---T
	1,000	10×20	680	EWHE1EM102G20 ---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	Part Number
25	2,200	12.5×25	1,090	EWHE1EM222W25 ---T
	3,300	16×25	1,400	EWHE1EM332L25 ---T
	4,700	16×30	1,710	EWHE1EM472L30 ---T
	6,800	18×35	2,040	EWHE1EM682M35 ---T
35	4.7	5×11	28	EWHE1VM4R7D11 ---T
	10	5×11	41	EWHE1VM100D11 ---T
	22	5×11	61	EWHE1VM220D11 ---T
	33	5×11	75	EWHE1VM330D11 ---T
	47	5×11	90	EWHE1VM470D11 ---T
	100	6.3×11	150	EWHE1VM101E11 ---T
	220	8×12	270	EWHE1VM221F12 ---T
	330	10×13	350	EWHE1VM331G13 ---T
	470	10×16	460	EWHE1VM471G16 ---T
	1,000	12.5×20	810	EWHE1VM102W20 ---T
	2,200	16×25	1,260	EWHE1VM222L25 ---T
	3,300	16×35	1,610	EWHE1VM332L35 ---T
50	0.1	5×11	1.3	EWHE1HMR10D11 ---T
	0.22	5×11	2.9	EWHE1HMR22D11 ---T
	0.33	5×11	4.3	EWHE1HMR33D11 ---T
	0.47	5×11	6.2	EWHE1HMR47D11 ---T
	1	5×11	13	EWHE1HM010D11 ---T
	2.2	5×11	20	EWHE1HM2R2D11 ---T
	3.3	5×11	25	EWHE1HM3R3D11 ---T
	4.7	5×11	30	EWHE1HM4R7D11 ---T
	10	5×11	40	EWHE1HM100D11 ---T
	22	5×11	65	EWHE1HM220D11 ---T
	33	6.3×11	90	EWHE1HM330E11 ---T
	47	6.3×11	110	EWHE1HM470E11 ---T
63	100	8×11	180	EWHE1HM101F11 ---T
	220	10×13	300	EWHE1HM221G13 ---T
	330	10×16	410	EWHE1HM331G16 ---T
	470	10×20	530	EWHE1HM471G20 ---T
	1,000	12.5×25	950	EWHE1HM102W25 ---T
	2,200	16×35	1,470	EWHE1HM222L35 ---T
	3,300	18×35	1,770	EWHE1HM332M35 ---T
	10	5×11	46	EWHE1JM100D11 ---T
	22	5×11	71	EWHE1JM220D11 ---T
	33	6.3×11	100	EWHE1JM330E11 ---T
	47	6.3×11	120	EWHE1JM470E11 ---T
	100	10×13	215	EWHE1JM101G13 ---T
100	220	10×16	335	EWHE1JM221G16 ---T
	330	10×20	510	EWHE1JM331G20 ---T
	470	12.5×20	640	EWHE1JM471W20 ---T
	1,000	16×25	930	EWHE1JM102L25 ---T
	0.1	5×11	1.5	EWHE1KMR10D11 ---T
	0.22	5×11	3.4	EWHE1KMR22D11 ---T
	0.33	5×11	5	EWHE1KMR33D11 ---T
	0.47	5×11	7.1	EWHE1KMR47D11 ---T
	1	5×11	15	EWHE1KM010D11 ---T
	2.2	5×11	21	EWHE1KM2R2D11 ---T
	3.3	5×11	29	EWHE1KM3R3D11 ---T

WHseries

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	Part Number
100	4.7	5×11	32	EWH1KM4R7D11 ---T
	10	6.3×11	54	EWH1KM100E11 ---T
	22	8×11	93	EWH1KM220F11 ---T
	33	8×12	130	EWH1KM330F12 ---T
	47	10×13	165	EWH1KM470G13 ---T
	100	10×20	265	EWH1KM101G20 ---T
	220	12.5×25	440	EWH1KM221W25 ---T
	330	16×25	540	EWH1KM331L25 ---T
	470	16×30	715	EWH1KM471L30 ---T
	1,000	18×40	985	EWH1KM102M40 ---T
160	3.3	6.3×9	28	EWH2CM3R3E09 ---T
	4.7	6.3×9	34	EWH2CM4R7E09 ---T
	10	6.3×12	60	EWH2CM100E12 ---T
	10	8×9	60	EWH2CM100F09 ---T
	22	8×12	88	EWH2CM220F12 ---T
	22	10×12	98	EWH2CM220G12 ---T
	33	10×12	140	EWH2CM330G12 ---T
	33	10×16	158	EWH2CM330G16 ---T
	47	10×14	142	EWH2CM470G14 ---T
	47	10×20	182	EWH2CM470G20 ---T
	68	10×20	240	EWH2CM680G20 ---T
	100	12.5×20	300	EWH2CM101W20 ---T
	100	16×20	316	EWH2CM101L20 ---T
	220	16×25	530	EWH2CM221L25 ---T
	330	18×25	600	EWH2CM331M25 ---T
	470	18×35	820	EWH2CM471M35 ---T
200	1	6.3×7	12	EWH2DM010E07 ---T
	2.2	6.3×7	18	EWH2DM2R2E07 ---T
	3.3	6.3×9	28	EWH2DM3R3E09 ---T
	4.7	6.3×9	40	EWH2DM4R7E09 ---T
	10	8×9	70	EWH2DM100F09 ---T
	10	8×12	78	EWH2DM100F12 ---T
	22	8×16	110	EWH2DM220F16 ---T
	22	10×12	110	EWH2DM220G12 ---T
	33	10×16	166	EWH2DM330G16 ---T
	33	10×20	185	EWH2DM330G20 ---T
	47	10×20	200	EWH2DM470G20 ---T
	68	12.5×20	290	EWH2DM680W20 ---T
	82	12.5×20	300	EWH2DM820W20 ---T
	100	12.5×25	340	EWH2DM101W25 ---T
	100	13×20	305	EWH2DM101K20 ---T
	100	16×20	325	EWH2DM101L20 ---T
	150	16×25	446	EWH2DM151L25 ---T
	180	16×25	530	EWH2DM181L25 ---T
	220	18×25	620	EWH2DM221M25 ---T
	330	18×30	720	EWH2DM331M30 ---T
	470	18×40	840	EWH2DM471M40 ---T
250	2.2	6.3×9	21	EWH2EM2R2E09 ---T
	3.3	6.3×9	30	EWH2EM3R3E09 ---T
	4.7	6.3×12	38	EWH2EM4R7E12 ---T
	4.7	8×9	45	EWH2EM4R7F09 ---T
	10	8×12	70	EWH2EM100F12 ---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	Part Number
250	10	10×12	75	EWH2EM100G12 ---T
	22	8×16	100	EWH2EM220F16 ---T
	22	10×16	116	EWH2EM220G16 ---T
	33	10×20	150	EWH2EM330G20 ---T
	33	12.5×16	165	EWH2EM330W16 ---T
	47	12.5×20	232	EWH2EM470W20 ---T
	100	16×25	370	EWH2EM101L25 ---T
	150	18×25	455	EWH2EM151M25 ---T
	220	18×30	600	EWH2EM221M30 ---T
	330	18×35	705	EWH2EM331M35 ---T
350	1	6.3×9	13	EWH2VM010E09 ---T
	2.2	6.3×9	23	EWH2VM2R2E09 ---T
	3.3	8×9	31	EWH2VM3R3F09 ---T
	4.7	8×9	45	EWH2VM4R7F09 ---T
	10	10×12	68	EWH2VM100G12 ---T
	22	10×20	135	EWH2VM220G20 ---T
	33	12.5×20	184	EWH2VM330W20 ---T
	47	16×20	225	EWH2VM470L20 ---T
	68	16×25	336	EWH2VM680L25 ---T
	100	18×30	398	EWH2VM101M30 ---T
400	1	6.3×9	14	EWH2GM010E09 ---T
	2.2	6.3×9	25	EWH2GM2R2E09 ---T
	2.2	8×9	30	EWH2GM2R2F09 ---T
	3.3	6.3×12	33	EWH2GM3R3E12 ---T
	3.3	8×9	34	EWH2GM3R3F09 ---T
	4.7	8×9	45	EWH2GM4R7F09 ---T
	4.7	8×12	48	EWH2GM4R7F12 ---T
	10	8×12	85	EWH2GM100F12 ---T
	10	8×16	92	EWH2GM100F16 ---T
	10	10×12	92	EWH2GM100G12 ---T
	22	10×20	160	EWH2GM220G20 ---T
	33	10×30	255	EWH2GM330G30 ---T
	33	16×20	258	EWH2GM330L20 ---T
	39	10×35	300	EWH2GM390G35 ---T
	47	10×40	305	EWH2GM470G40 ---T
	47	16×20	290	EWH2GM470L20 ---T
	56	10×45	350	EWH2GM560G45 ---T
	56	12.5×30	320	EWH2GM560W30 ---T
	68	12.5×35	435	EWH2GM680W35 ---T
	68	16×25	420	EWH2GM680L25 ---T
	68	18×20	420	EWH2GM680M20 ---T
	82	12.5×40	480	EWH2GM820W40 ---T
	82	18×25	474	EWH2GM820M25 ---T
	100	12.5×45	510	EWH2GM101W45 ---T
	100	16×30	492	EWH2GM101L30 ---T
	100	18×30	532	EWH2GM101M30 ---T
	120	18×30	550	EWH2GM121M30 ---T
	150	18×35	610	EWH2GM151M35 ---T
	150	20×30	620	EWH2GM151N30 ---T
	180	18×40	668	EWH2GM181M40 ---T
	180	20×35	676	EWH2GM181N35 ---T
	180	22×30	672	EWH2GM181O30 ---T

WHseries

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	Part Number
400	220	18×45	768	EWH2GM221M45 ---T
	220	20×40	772	EWH2GM221N40 ---T
	220	22×35	764	EWH2GM221O35 ---T
	250	20×45	820	EWH2GM251N45 ---T
	250	22×40	820	EWH2GM251O40 ---T
	270	18×50	856	EWH2GM271M50 ---T
	270	20×50	868	EWH2GM271N50 ---T
	270	22×46	864	EWH2GM271O46 ---T
	300	18×55	904	EWH2GM301M55 ---T
	300	20×55	916	EWH2GM301N55 ---T
	300	22×50	912	EWH2GM301O50 ---T
	330	18×60	952	EWH2GM331M60 ---T
	330	22×55	952	EWH2GM331O55 ---THO
	350	20×60	984	EWH2GM351N60 ---T
	390	22×60	1,012	EWH2GM391O60 ---THO
420	120	18×30	558	EWH2TM121M30 ---T
	150	18×35	632	EWH2TM151M35 ---T
	150	20×30	640	EWH2TM151N30 ---T
	180	18×40	690	EWH2TM181M40 ---T
	180	20×35	698	EWH2TM181N35 ---T
	180	22×30	694	EWH2TM181O30 ---T
	220	18×45	793	EWH2TM221M45 ---T
	220	20×40	798	EWH2TM221N40 ---T
	220	22×35	789	EWH2TM221O35 ---T
	250	20×45	847	EWH2TM251N45 ---T
	250	22×40	847	EWH2TM251O40 ---T
	270	18×50	884	EWH2TM271M50 ---T
	270	20×50	897	EWH2TM271N50 ---T
	270	22×46	893	EWH2TM271O46 ---T
	300	18×55	934	EWH2TM301M55 ---T
	300	20×55	946	EWH2TM301N55 ---T
	300	22×50	942	EWH2TM301O50 ---T
	330	18×60	983	EWH2TM331M60 ---T
450	330	22×55	983	EWH2TM331O55 ---THO
	350	20×60	1,017	EWH2TM351N60 ---T
	390	22×60	1,045	EWH2TM391O60 ---THO
	1	6.3×9	14	EWH2WM010E09 ---T
	1	6.3×12	16	EWH2WM010E12 ---T
	2.2	6.3×12	20	EWH2WM2R2E12 ---T
	2.2	8×9	22	EWH2WM2R2F09 ---T
	2.2	8×12	25	EWH2WM2R2F12 ---T
	3.3	8×9	22	EWH2WM3R3F09 ---T
	3.3	8×12	32	EWH2WM3R3F12 ---T
	4.7	8×12	44	EWH2WM4R7F12 ---T
	4.7	10×12	48	EWH2WM4R7G12 ---T
450	10	10×16	85	EWH2WM100G16 ---T
	10	10×20	90	EWH2WM100G20 ---T
	22	12.5×20	150	EWH2WM220W20 ---T
	22	16×20	185	EWH2WM220L20 ---T
	27	10×30	195	EWH2WM270G30 ---T
	33	10×35	210	EWH2WM330G35 ---T
	33	16×20	200	EWH2WM330L20 ---T

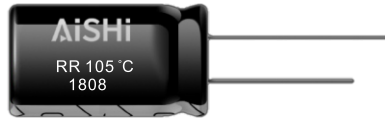
WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	Part Number
450	39	10×40	250	EWH2WM390G40 ---T
	47	10×45	330	EWH2WM470G45 ---T
	47	12.5×30	320	EWH2WM470W30 ---T
	47	16×25	335	EWH2WM470L25 ---T
	56	12.5×35	360	EWH2WM560W35 ---T
	68	12.5×40	400	EWH2WM680W40 ---T
	68	18×25	400	EWH2WM680M25 ---T
	82	12.5×45	460	EWH2WM820W45 ---T
	82	16×30	460	EWH2WM820L30 ---T
	82	18×30	472	EWH2WM820M30 ---T
	100	16×35	480	EWH2WM101L35 ---T
	100	18×35	530	EWH2WM101M35 ---T
	100	20×30	517	EWH2WM101N30 ---T
	120	20×35	578	EWH2WM121N35 ---T
	120	22×30	560	EWH2WM121O30 ---T
	150	18×40	610	EWH2WM151M40 ---T
	150	22×35	621	EWH2WM151O35 ---T
	180	18×45	694	EWH2WM181M45 ---T
	180	20×40	703	EWH2WM181N40 ---T
	200	18×50	759	EWH2WM201M50 ---T
	200	20×45	767	EWH2WM201N45 ---T
	200	22×40	759	EWH2WM201O40 ---T
	220	18×55	819	EWH2WM221M55 ---T
	220	20×50	828	EWH2WM221N50 ---T
	250	18×60	879	EWH2WM251M60 ---T
	250	20×55	888	EWH2WM251N55 ---T
500	250	22×46	892	EWH2WM251O46 ---T
	270	20×60	948	EWH2WM271N60 ---T
	270	22×50	953	EWH2WM271O50 ---T
	330	22×55	1,026	EWH2WM331O55 ---THO
	350	22×60	1,047	EWH2WM351O60 ---THO
	4.7	10×12	47	EWH2HM4R7G12 ---T
	4.7	10×16	50	EWH2HM4R7G16 ---T
	10	10×20	90	EWH2HM100G20 ---T
	10	12.5×20	115	EWH2HM100W20 ---T
	15	12.5×20	130	EWH2HM150W20 ---T
	15	12.5×25	140	EWH2HM150W25 ---T
	22	13×25	170	EWH2HM220K25 ---T
	22	16×20	180	EWH2HM220L20 ---T
	22	16×25	185	EWH2HM220L25 ---T
	33	16×25	200	EWH2HM330L25 ---T
	33	18×25	215	EWH2HM330M25 ---T
	47	18×25	300	EWH2HM470M25 ---T
	68	18×30	380	EWH2HM680M30 ---T
	68	18×35	390	EWH2HM680M35 ---T
	82	18×35	450	EWH2HM820M35 ---T
	82	18×40	490	EWH2HM820M40 ---T
	100	18×40	520	EWH2HM101M40 ---T
	100	22×35	535	EWH2HM101O35 ---T
	120	22×40	550	EWH2HM121O40 ---T

※Specifications subject to change without notice

Radial Type

RR series

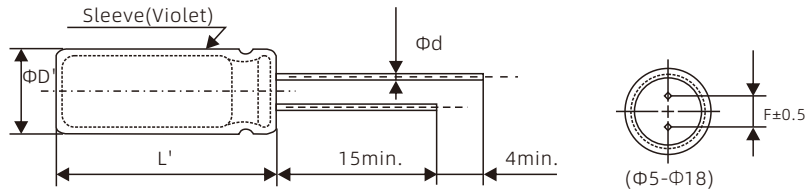
- Endurance: 2,000 hours at 105°C
- High frequency, low impedance, high reliability
- Suitable for switching power, UPS, power sources, etc.
- RoHS Compliant



SPECIFICATIONS

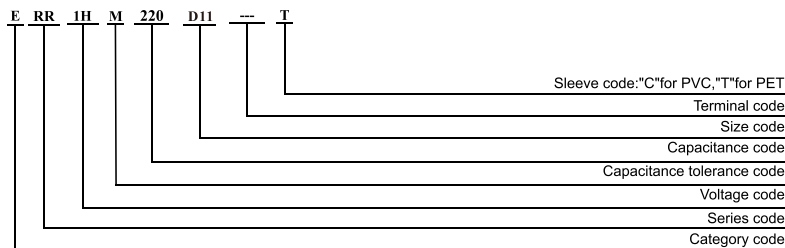
Items	Characteristics											
Category Temperature Range	-40 ~ +105°C											
Rated Voltage Range	6.3 ~ 120 Vdc											
Capacitance Tolerance	±20% (M) (at 20°C,120Hz)											
Leakage Current	I≤0.01CV or 3μA, whichever is greater.											
	Where, I:Max. leakage current (μA), C:Nominal capacitance (μF), V:Rated voltage (V)											
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	80	100	120	(at 20°C,120Hz)
	Dissipation Factor(Max.)	0.22	0.18	0.14	0.12	0.10	0.08	0.08	0.08	0.08	0.12	
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.											
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	80	100	120	(at 120Hz)
	Z(-25°C)/Z(+20°C)	2	2	2	2	2	2	2	2	2	3	
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for 2,000 hours at 105°C.											
	Capacitance Change	≤±20% of the initial value (6.3~10 Vdc: ≤±30%)										
	Dissipation Factor	≤200% of the initial specified value										
	Leakage Current	≤The initial specified value										
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.											
	Capacitance Change	≤±20% of the initial value										
	Dissipation Factor	≤200% of the initial specified value										
	Leakage Current	≤200% of the initial specified value										

DIMENSIONS [mm]



ØD	5	6.3	8	10	12.5	13	16	18
Ød	0.5	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	7.5
ØD'	ØD+0.5max.							
L'	L+2max.							

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	120	1K	10K	100K
Cap. <220	0.40	0.75	0.90	1.00
220≤Cap. <680	0.50	0.85	0.94	1.00
680≤Cap. <2,200	0.60	0.87	0.95	1.00
2,200≤Cap. <4,700	0.75	0.90	0.95	1.00
Cap. ≥4,700	0.85	0.95	0.98	1.00

RR series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ØD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
6.3	220	6.3×7	0.350	218	ERR0JM221E07---T
	330	6.3×9	0.200	350	ERR0JM331E09---T
	470	6.3×9	0.180	400	ERR0JM471E09---T
	560	6.3×11	0.180	480	ERR0JM561E11---T
	560	8×9	0.120	550	ERR0JM561F09---T
	820	8×16	0.056	995	ERR0JM821F16---T
	820	10×9	0.085	800	ERR0JM821G09---T
	1,000	10×13	0.053	1,030	ERR0JM102G13---T
	1,200	8×20	0.041	1,250	ERR0JM122F20---T
	1,200	10×16	0.038	1,430	ERR0JM122G16---T
	1,500	10×20	0.023	1,820	ERR0JM152G20---T
	2,200	10×25	0.022	2,150	ERR0JM222G25---T
	3,900	12.5×25	0.018	2,770	ERR0JM392W25---T
	4,700	12.5×30	0.016	3,290	ERR0JM472W30---T
	5,600	12.5×35	0.015	3,400	ERR0JM562W35---T
	5,600	16×20	0.018	3,140	ERR0JM562L20---T
	6,800	16×25	0.016	3,460	ERR0JM682L25---T
10	100	5×11	0.550	250	ERR1AM101D11---T
	150	5×12	0.500	300	ERR1AM151D12---T
	220	6.3×11	0.130	405	ERR1AM221E11---T
	330	6.3×11	0.120	471	ERR1AM331E11---T
	470	6.3×12	0.091	630	ERR1AM471E12---T
	470	8×11	0.072	760	ERR1AM471F11---T
	680	8×12	0.070	830	ERR1AM681F12---T
	680	10×13	0.053	1,030	ERR1AM681G13---T
	820	8×12	0.055	950	ERR1AM821F12---T
	1,000	8×16	0.050	1,074	ERR1AM102F16---T
	1,000	10×16	0.038	1,430	ERR1AM102G16---T
	1,200	10×16	0.034	1,550	ERR1AM122G16---T
	1,500	10×16	0.034	1,587	ERR1AM152G16---T
	2,200	10×20	0.031	1,978	ERR1AM222G20---T
	2,200	12.5×20	0.028	2,360	ERR1AM222W20---T
	3,300	12.5×20	0.025	2,490	ERR1AM332W20---T
	4,700	13×25	0.022	2,835	ERR1AM472K25---T
	5,600	16×25	0.016	3,460	ERR1AM562L25---T
	100	5×11	0.570	320	ERR1CM101D11---T
	100	6.3×11	0.350	326	ERR1CM101E11---T
16	220	6.3×11	0.120	530	ERR1CM221E11---T
	220	8×11	0.085	570	ERR1CM221F11---T
	330	6.3×12	0.110	564	ERR1CM331E12---T
	330	8×12	0.072	760	ERR1CM331F12---T
	470	8×16	0.056	795	ERR1CM471F16---T

RR series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
16	470	10×13	0.053	1,030	ERR1CM471G13---T
	680	8×16	0.045	1,070	ERR1CM681F16---T
	1,000	8×16	0.043	1,380	ERR1CM102F16---T
	1,000	10×13	0.052	1,380	ERR1CM102G13---T
	1,500	10×20	0.031	1,980	ERR1CM152G20---T
	2,200	12.5×20	0.040	2,640	ERR1CM222W20---T
	3,300	13×25	0.024	2,850	ERR1CM332K25---T
	4,700	16×25	0.016	3,560	ERR1CM472L25---T
25	47	5×11	0.720	250	ERR1EM470D11---T
	68	5×11	0.650	260	ERR1EM680D11---T
	100	5×11	0.400	350	ERR1EM101D11---T
	100	6.3×11	0.280	405	ERR1EM101E11---T
	220	6.3×12	0.140	597	ERR1EM221E12---T
	220	8×11	0.072	760	ERR1EM221F11---T
	330	8×12	0.085	930	ERR1EM331F12---T
	470	8×16	0.055	1,010	ERR1EM471F16---T
	470	10×13	0.057	1,200	ERR1EM471G13---T
	680	8×16	0.057	980	ERR1EM681F16---T
	680	10×16	0.050	1,280	ERR1EM681G16---T
	820	10×20	0.036	1,500	ERR1EM821G20---T
	1,000	10×20	0.035	1,820	ERR1EM102G20---T
	1,500	12.5×20	0.022	2,150	ERR1EM152W20---T
	2,200	12.5×25	0.018	2,770	ERR1EM222W25---T
	33	5×11	0.600	250	ERR1VM330D11---T
35	47	5×12	0.480	270	ERR1VM470D12---T
	47	6.3×11	0.450	352	ERR1VM470E11---T
	56	6.3×11	0.390	405	ERR1VM560E11---T
	100	6.3×11	0.350	490	ERR1VM101E11---T
	100	8×11	0.200	538	ERR1VM101F11---T
	150	8×12	0.170	760	ERR1VM151F12---T
	220	8×12	0.100	789	ERR1VM221F12---T
	220	10×13	0.066	1,030	ERR1VM221G13---T
	330	8×16	0.064	1,030	ERR1VM331F16---T
	470	8×20	0.055	1,320	ERR1VM471F20---T
	470	10×16	0.045	1,485	ERR1VM471G16---T
	560	10×20	0.035	1,850	ERR1VM561G20---T
	680	10×20	0.030	1,980	ERR1VM681G20---T
	1,000	12.5×20	0.028	2,440	ERR1VM102W20---T
	1,500	12.5×30	0.026	3,010	ERR1VM152W30---T
	2,200	16×25	0.025	3,490	ERR1VM222L25---T
	22	5×11	0.840	238	ERR1HM220D11---T
	22	6.3×11	0.540	260	ERR1HM220E11---T
50					

RR series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
50	47	6.3×11	0.300	310	ERR1HM470E11---T
	56	6.3×12	0.280	385	ERR1HM560E12---T
	100	8×12	0.130	724	ERR1HM101F12---T
	120	8×16	0.100	950	ERR1HM121F16---T
	120	10×13	0.120	900	ERR1HM121G13---T
	150	10×13	0.120	979	ERR1HM151G13---T
	220	8×16	0.120	960	ERR1HM221F16---T
	220	10×13	0.110	980	ERR1HM221G13---T
	330	10×16	0.072	1,370	ERR1HM331G16---T
	470	10×20	0.046	1,690	ERR1HM471G20---T
	470	12.5×20	0.042	2,050	ERR1HM471W20---T
	680	12.5×20	0.038	2,200	ERR1HM681W20---T
	1,000	13×25	0.030	2,500	ERR1HM102K25---T
	33	6.3×11	0.450	266	ERR1JM330E11---T
63	47	6.3×12	0.450	266	ERR1JM470E12---T
	47	8×12	0.350	320	ERR1JM470F12---T
	100	8×12	0.250	450	ERR1JM101F12---T
	220	10×13	0.210	690	ERR1JM221G13---T
	330	10×20	0.080	1,160	ERR1JM331G20---T
	470	13×20	0.060	1,995	ERR1JM471K20---T
	680	12.5×25	0.045	2,350	ERR1JM681W25---T
	680	16×20	0.039	2,400	ERR1JM681L20---T
	1,000	13×30	0.056	2,680	ERR1JM102K30---T
	1,000	16×25	0.050	2,800	ERR1JM102L25---T
	1,500	18×30	0.035	2,900	ERR1JM152M30---T
	2,200	18×40	0.032	3,250	ERR1JM222M40---T
	22	6.3×11	1.200	136	ERR1BM220E11---T
	33	6.3×12	0.970	145	ERR1BM330E12---T
80	33	8×9	1.000	140	ERR1BM330F09---T
	47	8×12	0.420	450	ERR1BM470F12---T
	56	8×12	0.400	480	ERR1BM560F12---T
	68	8×12	0.380	510	ERR1BM680F12---T
	82	8×16	0.360	585	ERR1BM820F16---T
	100	8×16	0.320	620	ERR1BM101F16---T
	150	10×16	0.250	800	ERR1BM151G16---T
	220	10×20	0.200	870	ERR1BM221G20---T
	220	12.5×16	0.200	870	ERR1BM221W16---T
	0.47	5×11	5.000	10	ERR1KMR47D11---T
	1	5×11	4.500	50	ERR1KM010D11---T
	2.2	5×11	3.600	60	ERR1KM2R2D11---T
	3.3	5×11	3.000	75	ERR1KM3R3D11---T
	4.7	5×11	2.500	90	ERR1KM4R7D11---T
100					

RR series

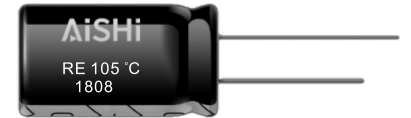
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
100	10	5×11	1.850	130	ERR1KM100D11---T
	10	6.3×11	1.500	140	ERR1KM100E11---T
	22	6.3×12	0.800	210	ERR1KM220E12---T
	33	8×12	0.450	235	ERR1KM330F12---T
	47	8×12	0.450	235	ERR1KM470F12---T
	47	10×13	0.340	380	ERR1KM470G13---T
	68	8×16	0.300	360	ERR1KM680F16---T
	68	10×13	0.300	380	ERR1KM680G13---T
	100	8×25	0.350	453	ERR1KM101F25---T
	100	10×16	0.350	460	ERR1KM101G16---T
	150	10×20	0.170	740	ERR1KM151G20---T
	220	13×20	0.100	880	ERR1KM221K20---T
	330	13×25	0.080	1,010	ERR1KM331K25---T
	330	16×20	0.078	1,030	ERR1KM331L20---T
	470	16×25	0.048	1,250	ERR1KM471L25---T
	680	16×35	0.038	1,660	ERR1KM681L35---T
	680	18×30	0.035	1,650	ERR1KM681M30---T
	1,000	18×35	0.030	2,300	ERR1KM102M35---T
120	10	6.3×12	6.000	85	ERR2BM100E12---T
	15	6.3×12	4.000	110	ERR2BM150E12---T
	22	8×12	3.000	140	ERR2BM220F12---T
	33	8×16	2.000	220	ERR2BM330F16---T
	33	10×13	3.000	240	ERR2BM330G13---T
	47	8×20	2.800	285	ERR2BM470F20---T
	47	10×16	2.800	300	ERR2BM470G16---T
	56	10×16	2.500	350	ERR2BM560G16---T
	68	10×16	2.200	350	ERR2BM680G16---T
	82	10×20	2.000	380	ERR2BM820G20---T
	100	10×25	1.700	420	ERR2BM101G25---T
	120	12.5×20	1.500	500	ERR2BM121W20---T
	150	12.5×25	1.100	620	ERR2BM151W25---T
	220	13×30	0.850	760	ERR2BM221K30---T
	220	16×20	1.200	760	ERR2BM221L20---T
	330	16×30	0.400	950	ERR2BM331L30---T
	330	18×25	0.450	930	ERR2BM331M25---T
	470	16×40	0.350	1,030	ERR2BM471L40---T
	470	18×30	0.350	1,030	ERR2BM471M30---T

※Specifications subject to change without notice

RE series

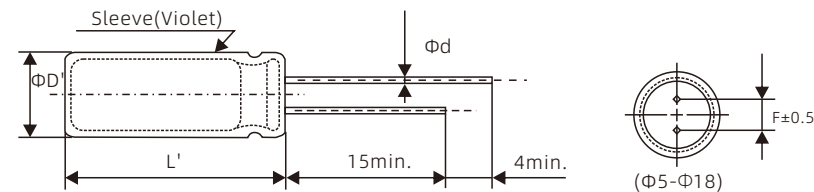
- Endurance: 2,000 ~ 4,000 hours at 105°C
- High frequency, low impedance
- Suitable for switching power, UPS, power sources, etc.
- RoHS Compliant



SPECIFICATIONS

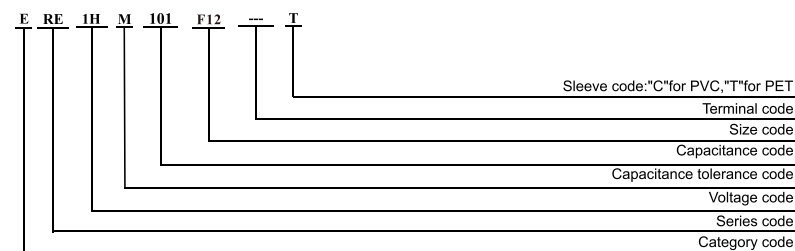
Items	Characteristics												
Category Temperature Range	-40~+105°C												
Rated Voltage Range	6.3~120Vdc												
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)												
Leakage Current	Is0.01CV or 3μA, whichever is greater. Where, I:Max. leakage current (μA), C:Nominal capacitance (μF), V:Rated voltage (V)												
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	80	100	120	(at 20°C,120Hz)	
	Dissipation Factor(Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.08	0.12		
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.												
Low Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	80	100	120	(120Hz)	
	Z(-25°C)/Z(+20°C)	4	3	2						3			
	Z(-40°C)/Z(+20°C)	8	6	4	3						6		
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for a specified period of time at 105°C.											Case Dia.(mm)	Load life (hours)
	Capacitance Change	≤±25% of the initial value									ØD≤6.3	2,000	
	Dissipation Factor	≤200% of the initial specified value									ØD=8&10	3,000	
	Leakage Current	≤The initial specified value									ØD≥12.5	4,000	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.												
	Capacitance Change	≤±25% of the initial value											
	Dissipation Factor	≤200% of the initial specified value											
	Leakage Current	≤200% of the initial specified value											

DIMENSIONS [mm]



ΦD	5	6.3	8	10	12.5	13	16	18
Φd	0.5	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	7.5
ΦD*	ØD+0.5max.							
L'	L+2max.							

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Freq. (Hz)	120	1K	10K	100K
Cap. <220	0.40	0.75	0.90	1.00
220≤Cap. <680	0.50	0.85	0.94	1.00
680≤Cap. <2,200	0.60	0.87	0.95	1.00
2,200≤Cap. <4,700	0.75	0.90	0.95	1.00
Cap. ≥4,700	0.85	0.95	0.98	1.00

RE series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
6.3	330	8×11	0.130	650	ERE0JM331F11---T
	470	8×11	0.130	650	ERE0JM471F11---T
	680	8×12	0.130	680	ERE0JM681F12--T
	1,000	8×12	0.130	720	ERE0JM102F12--T
	1,000	10×13	0.080	870	ERE0JM102G13---T
	1,500	10×16	0.060	1,210	ERE0JM152G16---T
	2,200	10×20	0.045	1,400	ERE0JM222G20---T
	3,300	12.5×20	0.035	1,900	ERE0JM332W20 ---T
	4,700	12.5×25	0.030	2,130	ERE0JM472W25 ---T
10	470	8×11	0.130	650	ERE1AM471F11---T
	680	8×12	0.130	650	ERE1AM681F12---T
	1,000	8×16	0.087	850	ERE1AM102F16---T
	1,000	10×16	0.060	1,210	ERE1AM102G16---T
	1,500	10×16	0.050	1,300	ERE1AM152G16---T
	2,200	10×20	0.045	1,400	ERE1AM222G20---T
	3,300	13×25	0.030	2,130	ERE1AM332K25---T
16	220	8×11	0.250	650	ERE1CM221F11---T
	330	8×11	0.130	650	ERE1CM331F11---T
	470	8×12	0.130	650	ERE1CM471F12--T
	470	10×13	0.080	870	ERE1CM471G13---T
	560	8×12	0.130	650	ERE1CM561F12--T
	680	8×16	0.087	850	ERE1CM681F16--T
	680	10×13	0.080	870	ERE1CM681G13---T
	1,000	8×20	0.060	1,210	ERE1CM102F20--T
	1,000	10×13	0.080	870	ERE1CM102G13---T
	1,500	10×20	0.045	1,400	ERE1CM152G20---T
	2,200	13×20	0.035	1,900	ERE1CM222K20---T
	3,300	12.5×35	0.027	2,500	ERE1CM332W35---T
25	100	6.3×11	0.250	340	ERE1EM101E11---T
	220	6.3×11	0.210	350	ERE1EM221E11---T
	220	8×12	0.130	650	ERE1EM221F12---T
	330	8×12	0.130	650	ERE1EM331F12---T
	470	8×16	0.087	840	ERE1EM471F16---T
	470	10×13	0.080	870	ERE1EM471G13---T
	560	10×13	0.078	960	ERE1EM561G13---T
	680	8×16	0.080	870	ERE1EM681F16---T
	680	10×16	0.060	1,210	ERE1EM681G16--T
	1,000	10×20	0.045	1,400	ERE1EM102G20--T
	1,000	12.5×13	0.050	1,250	ERE1EM102W13 ---T
	1,500	13×20	0.035	1,900	ERE1EM152K20---T
	2,200	12.5×25	0.030	2,130	ERE1EM222W25---T
	3,300	12.5×30	0.025	2,600	ERE1EM332W30---T
	3,300	16×20	0.025	2,600	ERE1EM332L20---T
	4,700	16×25	0.023	2,860	ERE1EM472L25---T

RE series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
35	56	5×12	0.800	200	ERE1VM560D12---T
	68	5×12	0.720	220	ERE1VM680D12---T
	100	6.3×11	0.350	350	ERE1VM101E11---T
	100	8×11	0.130	650	ERE1VM101F11---T
	150	8×12	0.130	650	ERE1VM151F12---T
	220	8×12	0.130	650	ERE1VM221F12---T
	330	8×16	0.072	840	ERE1VM331F16---T
	330	10×13	0.080	870	ERE1VM331G13---T
	470	10×16	0.060	1,210	ERE1VM471G16---T
	560	10×16	0.060	1,210	ERE1VM561G16---T
	680	10×20	0.045	1,400	ERE1VM681G20---T
	680	12.5×16	0.058	1,380	ERE1VM681W16---T
	1,000	12.5×20	0.035	1,900	ERE1VM102W20---T
	1,500	12.5×25	0.030	2,124	ERE1VM152W25---T
	2,200	16×25	0.029	2,450	ERE1VM222L25---T
50	47	6.3×11	0.300	295	ERE1HM470E11---T
	100	6.3×12	0.280	375	ERE1HM101E12---T
	100	8×12	0.130	620	ERE1HM101F12--T
	150	8×12	0.130	620	ERE1HM151F12--T
	220	8×16	0.100	840	ERE1HM221F16--T
	220	10×16	0.084	1,050	ERE1HM221G16--T
	330	10×16	0.080	1,100	ERE1HM331G16--T
	470	10×20	0.075	1,200	ERE1HM471G20---T
	560	12.5×16	0.061	1,750	ERE1HM561W16 ---T
	820	12.5×20	0.040	1,900	ERE1HM821W20 ---T
	820	16×20	0.032	2,130	ERE1HM821L20---T
	1,000	12.5×25	0.034	2,100	ERE1HM102W25---T
	1,000	16×20	0.034	2,100	ERE1HM102L20--T
63	68	8×12	0.510	235	ERE1JM680F12---T
	100	8×12	0.500	235	ERE1JM101F12---T
	150	10×13	0.380	320	ERE1JM151G13---T
	220	10×16	0.170	450	ERE1JM221G16--T
	470	13×20	0.085	950	ERE1JM471K20---T
	560	16×18	0.079	1,020	ERE1JM561L18--T
	680	16×20	0.070	1,280	ERE1JM681L20--T
	820	12.5×30	0.071	1,200	ERE1JM821W30---T
	820	16×20	0.070	1,280	ERE1JM821L20--T
	1,000	16×25	0.045	1,900	ERE1JM102L25---T
80	56	8×12	0.490	260	ERE1BM560F12 ---T
	68	8×12	0.400	290	ERE1BM680F12 ---T
	100	10×13	0.300	330	ERE1BM101G13 ---T
	150	10×16	0.240	440	ERE1BM151G16 ---T
	220	10×20	0.180	510	ERE1BM221G20 ---T
	220	12.5×16	0.180	530	ERE1BM221W16 ---T

RE series

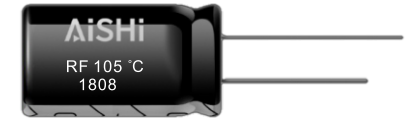
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
80	330	12.5×20	0.150	760	ERE1BM331W20---T
	470	12.5×25	0.072	980	ERE1BM471W25---T
	560	16×20	0.070	1,050	ERE1BM561L20---T
	680	16×25	0.065	1,250	ERE1BM681L25---T
	1,000	16×35	0.052	1,320	ERE1BM102L35---T
100	22	6.3×12	0.920	150	ERE1KM220E12--T
	47	8×12	0.910	260	ERE1KM470F12---T
	47	10×13	0.340	315	ERE1KM470G13---T
	68	8×16	0.320	360	ERE1KM680F16---T
	68	10×13	0.320	360	ERE1KM680G13---T
	100	10×16	0.200	450	ERE1KM101G16---T
	150	10×20	0.170	500	ERE1KM151G20--T
	220	13×20	0.095	930	ERE1KM221K20---T
	330	12.5×25	0.092	950	ERE1KM331W25---T
	330	16×20	0.088	1,050	ERE1KM331L20---T
	470	16×25	0.078	1,250	ERE1KM471L25---T
	470	18×20	0.070	1,200	ERE1KM471M20---T
	10	6.3×12	6.000	75	ERE2BM100E12---T
	15	6.3×12	5.000	96	ERE2BM150E12---T
	22	8×12	4.000	123	ERE2BM220F12---T
120	33	8×16	3.500	212	ERE2BM330F16---T
	33	10×13	3.000	212	ERE2BM330G13--T
	47	8×20	2.800	250	ERE2BM470F20---T
	47	10×16	2.800	265	ERE2BM470G16---T
	56	10×16	2.500	270	ERE2BM560G16--T
	68	10×16	2.200	270	ERE2BM680G16--T
	82	10×20	2.000	290	ERE2BM820G20--T
	100	10×25	1.700	360	ERE2BM101G25--T
	100	12.5×16	1.900	370	ERE2BM101W16---T
	120	12.5×20	1.500	495	ERE2BM121W20---T
	150	12.5×25	1.100	540	ERE2BM151W25---T
	220	16×20	0.820	660	ERE2BM221L20---T
	270	16×25	0.600	750	ERE2BM271L25---T
	270	18×20	0.600	750	ERE2BM271M20---T
	330	16×30	0.450	810	ERE2BM331L30---T
	330	18×25	0.450	810	ERE2BM331M25--T
	470	16×40	0.350	900	ERE2BM471L40---T
	470	18×30	0.350	900	ERE2BM471M30---T

※Specifications subject to change without notice

RF series

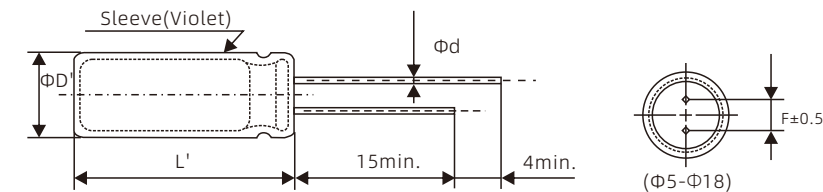
- Endurance: 3,000~ 6,000 hours at 105°C
- Ultra-low impedance, high ripple current
- RoHS Compliant



SPECIFICATIONS

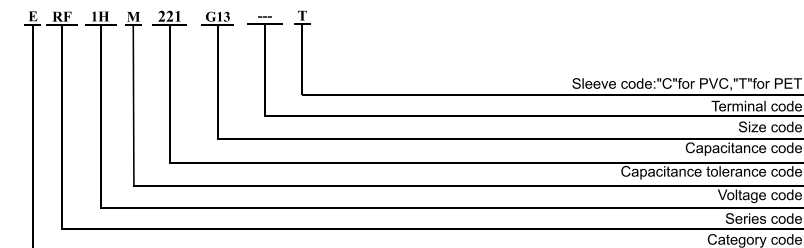
Items	Characteristics												
Category Temperature Range	-40~+105°C												
Rated Voltage Range	6.3~120Vdc												
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)												
Leakage Current	I ≤ 0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)												
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	80	100	120	(at 20°C, 120Hz)	
	Dissipation Factor(Max.)	0.15	0.14	0.12	0.10	0.10	0.08	0.08	0.08	0.08	0.12		
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.												
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	80	100	120	(120Hz)	
	Z(-25°C)/ Z(+20°C)	5	4	3							3		
	Z(-40°C)/ Z(+20°C)	10	8	5	4						6		
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for a specified period of time at 105°C.											Case Dia.	Life time (hours)
												ØD≤6.3	3,000
	Capacitance Change	≤±25% of the initial value										ØD=8	4,000
	Dissipation Factor	≤200% of the initial specified value										ØD=10	5,000
	Leakage Current	≤The initial specified value										ØD≥12.5	6,000
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.												
	Capacitance Change	≤±25% of the initial value											
	Dissipation Factor	≤200% of the initial specified value											
	Leakage Current	≤200% of the initial specified value											

DIMENSIONS [mm]



ΦD	5	6.3	8	10	12.5	13	16	18
Φd	0.5	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	7.5
ΦD*	ØD+0.5max.							
L'	L+2max.							

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	Freq. (Hz)	120	1K	10K	100K
Cap. <220		0.40	0.75	0.90	1.00
220≤Cap. <680		0.50	0.85	0.94	1.00
680≤Cap. <2,200		0.60	0.87	0.95	1.00
2,200≤Cap. <4,700		0.75	0.90	0.95	1.00
Cap. ≥4,700		0.85	0.95	0.98	1.00

RF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
6.3	150	5×11	0.290	300	ERF0JM151D11---T
	220	6.3×11	0.205	377	ERF0JM221E11---T
	330	6.3×11	0.120	455	ERF0JM331E11---T
	470	8×11	0.110	632	ERF0JM471F11---T
	1,000	8×16	0.052	1,000	ERF0JM102F16---T
	1,200	8×20	0.040	1,300	ERF0JM122F20---T
	1,200	10×16	0.037	1,480	ERF0JM122G16---T
	1,500	10×16	0.037	1,480	ERF0JM152G16---T
	2,200	10×20	0.021	2,200	ERF0JM222G20---T
	3,300	12.5×20	0.020	2,410	ERF0JM332W20---T
	4,700	12.5×30	0.015	3,340	ERF0JM472W30---T
	6,800	16×25	0.015	3,510	ERF0JM682L25---T
10	100	5×11	0.290	300	ERF1AM101D11---T
	100	6.3×9	0.290	300	ERF1AM101E09---T
	220	6.3×11	0.120	455	ERF1AM221E11---T
	470	8×12	0.071	810	ERF1AM471F12---T
	470	10×9	0.092	720	ERF1AM471G09---T
	680	8×16	0.055	1,046	ERF1AM681F16---T
	680	10×13	0.052	1,080	ERF1AM681G13---T
	1,000	8×20	0.040	1,300	ERF1AM102F20---T
	1,000	10×16	0.037	1,480	ERF1AM102G16---T
	1,500	10×20	0.032	2,220	ERF1AM152G20---T
	2,200	12.5×20	0.020	2,410	ERF1AM222W20---T
	3,300	12.5×25	0.017	2,820	ERF1AM332W25---T
	3,900	12.5×30	0.015	3,340	ERF1AM392W30---T
	4,700	12.5×35	0.014	3,450	ERF1AM472W35---T
	5,600	16×25	0.015	3,510	ERF1AM562L25---T
16	100	5×11	0.210	320	ERF1CM101D11---T
	220	6.3×12	0.084	721	ERF1CM221E12---T
	330	8×12	0.071	810	ERF1CM331F12---T
	330	10×9	0.092	720	ERF1CM331G09---T
	470	8×16	0.055	1,045	ERF1CM471F16---T
	470	10×13	0.052	1,080	ERF1CM471G13---T
	680	8×20	0.040	1,300	ERF1CM681F20---T
	680	10×16	0.040	1,480	ERF1CM681G16---T
	1,000	10×20	0.023	1,870	ERF1CM102G20---T
	1,200	10×25	0.021	2,200	ERF1CM122G25---T
	1,500	12.5×20	0.020	2,410	ERF1CM152W20---T
	2,200	12.5×25	0.017	2,820	ERF1CM222W25---T
	2,700	12.5×30	0.015	3,340	ERF1CM272W30---T
	2,700	16×20	0.017	3,190	ERF1CM272L20---T
	3,300	12.5×35	0.014	3,450	ERF1CM332W35---T

RF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
16	3,300	16×25	0.016	3,350	ERF1CM332L25---T
	3,900	16×25	0.015	3,510	ERF1CM392L25---T
25	47	5×11	0.290	300	ERF1EM470D11---T
	100	5×11	0.260	320	ERF1EM101D11---T
	100	6.3×11	0.140	455	ERF1EM101E11---T
	220	6.3×11	0.150	455	ERF1EM221E11---T
	220	8×12	0.071	810	ERF1EM221F12---T
	330	8×16	0.055	1,045	ERF1EM331F16---T
	330	10×13	0.052	1,080	ERF1EM331G13---T
	390	8×20	0.044	1,236	ERF1EM391F20---T
	470	8×16	0.045	1,120	ERF1EM471F16---T
	470	10×16	0.037	1,480	ERF1EM471G16---T
	560	10×16	0.030	1,675	ERF1EM561G16---T
	680	8×16	0.050	1,250	ERF1EM681F16---T
	680	10×20	0.027	1,870	ERF1EM681G20---T
	820	10×16	0.030	1,600	ERF1EM821G16---T
	820	10×25	0.021	2,200	ERF1EM821G25---T
	1,000	10×20	0.045	1,948	ERF1EM102G20---T
	1,000	12.5×20	0.019	2,550	ERF1EM102W20---T
	1,500	12.5×20	0.040	2,720	ERF1EM152W20---T
	1,500	12.5×25	0.017	2,820	ERF1EM152W25---T
	2,200	12.5×25	0.027	2,820	ERF1EM222W25---T
35	2,700	16×25	0.015	3,510	ERF1EM272L25---T
	33	5×11	0.570	300	ERF1VM330D11---T
	100	6.3×12	0.450	440	ERF1VM101E12---T
	100	8×11	0.200	632	ERF1VM101F11---T
	220	8×12	0.100	810	ERF1VM221F12---T
	220	10×9	0.120	720	ERF1VM221G09---T
	330	10×16	0.037	1,480	ERF1VM331G16---T
	470	10×16	0.055	1,526	ERF1VM471G16---T
	680	12.5×20	0.020	2,410	ERF1VM681W20---T
	1,000	12.5×25	0.017	2,820	ERF1VM102W25---T
	1,200	12.5×30	0.015	3,340	ERF1VM122W30---T
	1,200	16×20	0.017	3,190	ERF1VM122L20---T
	1,500	12.5×35	0.014	3,450	ERF1VM152W35---T
50	22	5×11	0.540	288	ERF1HM220D11---T
	56	6.3×12	0.300	435	ERF1HM560E12---T
	100	8×12	0.160	774	ERF1HM101F12---T
	120	8×16	0.130	1,000	ERF1HM121F16---T
	150	10×13	0.110	1,029	ERF1HM151G13---T
	180	8×20	0.085	1,240	ERF1HM181F20---T
	220	10×13	0.110	1,029	ERF1HM221G13---T

RF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
50	220	10×16	0.055	1,420	ERF1HM221G16---T
	270	10×13	0.120	1,020	ERF1HM271G13---T
	270	10×20	0.053	1,630	ERF1HM271G20---T
	330	10×16	0.045	1,450	ERF1HM331G16---T
	470	10×20	0.036	1,500	ERF1HM471G20---T
	470	12.5×20	0.026	2,100	ERF1HM471W20---T
	560	12.5×20	0.035	2,150	ERF1HM561W20---T
	560	12.5×25	0.022	2,460	ERF1HM561W25---T
	680	12.5×20	0.040	2,100	ERF1HM681W20---T
	680	12.5×30	0.020	2,910	ERF1HM681W30---T
	820	13×20	0.040	2,100	ERF1HM821K20---T
	820	16×20	0.022	2,780	ERF1HM821L20---T
	1,000	16×25	0.020	3,060	ERF1HM102L25---T
63	33	6.3×11	0.950	265	ERF1JM330E11---T
	47	6.3×12	0.800	500	ERF1JM470E12---T
	82	8×12	0.480	600	ERF1JM820F12---T
	82	10×13	0.420	690	ERF1JM820G13---T
	100	8×12	0.500	580	ERF1JM101F12---T
	100	10×13	0.300	720	ERF1JM101G13---T
	120	8×16	0.350	650	ERF1JM121F16---T
	150	10×13	0.300	720	ERF1JM151G13---T
	180	12.5×13	0.130	900	ERF1JM181W13---T
	220	10×16	0.160	800	ERF1JM221G16---T
	330	10×20	0.160	800	ERF1JM331G20---T
	470	13×20	0.100	880	ERF1JM471K20---T
	560	13×20	0.086	1,180	ERF1JM561K20---T
	680	16×20	0.085	1,250	ERF1JM681L20---T
	820	16×25	0.057	1,570	ERF1JM821L25---T
	1,000	16×25	0.045	1,800	ERF1JM102L25---T
	1,000	18×20	0.050	1,780	ERF1JM102M20---T
	1,500	18×30	0.036	2,150	ERF1JM152M30---T
	1,800	18×40	0.032	2,280	ERF1JM182M40---T
80	150	10×16	0.240	600	ERF1BM151G16---T
	220	10×20	0.150	680	ERF1BM221G20---T
	330	12.5×20	0.120	750	ERF1BM331W20---T
	470	16×20	0.080	1,150	ERF1BM471L20---T
	680	16×25	0.075	1,600	ERF1BM681L25---T
	680	18×25	0.036	1,750	ERF1BM681M25---T
	1,000	16×40	0.029	2,200	ERF1BM102L40---T
	1,000	18×35	0.027	2,200	ERF1BM102M35---T
100	6.8	5×11	1.400	125	ERF1KM6R8D11---T
	6.8	6.3×9	1.800	110	ERF1KM6R8E09---T

RF series

STANDARD RATINGS

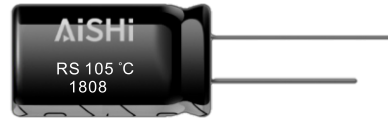
WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
100	22	6.3×12	0.570	385	ERF1KM220E12---T
	27	10×9	0.470	320	ERF1KM270G09---T
	39	8×16	0.360	450	ERF1KM390F16---T
	47	10×13	0.320	480	ERF1KM470G13---T
	56	8×20	0.260	565	ERF1KM560F20---T
	68	10×16	0.220	600	ERF1KM680G16---T
	100	10×16	0.200	750	ERF1KM101G16---T
	150	10×20	0.170	850	ERF1KM151G20---T
	220	13×20	0.150	860	ERF1KM221K20---T
	330	12.5×25	0.100	1,000	ERF1KM331W25---T
	330	16×20	0.070	1,350	ERF1KM331L20---T
	470	16×25	0.055	1,640	ERF1KM471L25---T
	560	18×25	0.050	1,800	ERF1KM561M25---T
	680	16×40	0.034	2,200	ERF1KM681L40---T
	680	18×35	0.034	2,200	ERF1KM681M35---T
	820	18×40	0.032	2,700	ERF1KM821M40---T
120	10	6.3×11	5.500	80	ERF2BM100E11---T
	22	8×12	3.500	130	ERF2BM220F12---T
	33	8×16	3.000	220	ERF2BM330F16---T
	33	10×13	3.000	220	ERF2BM330G13---T
	47	10×16	2.500	270	ERF2BM470G16---T
	56	10×16	2.200	285	ERF2BM560G16---T
	68	10×16	2.000	285	ERF2BM680G16---T
	82	10×20	1.800	300	ERF2BM820G20---T
	100	10×25	1.500	380	ERF2BM101G25---T
	120	13×20	1.300	520	ERF2BM121K20---T
	150	12.5×25	1.000	570	ERF2BM151W25---T
	220	12.5×30	0.750	700	ERF2BM221W30---T
	220	16×20	0.750	700	ERF2BM221L20---T
	270	16×25	0.550	800	ERF2BM271L25---T
	270	18×20	0.550	800	ERF2BM271M20---T
	330	16×30	0.420	860	ERF2BM331L30---T
	330	18×25	0.420	860	ERF2BM331M25---T
	470	16×40	0.300	960	ERF2BM471L40---T
	470	18×30	0.300	960	ERF2BM471M30---T

※Specifications subject to change without notice

Radial Type

RS series

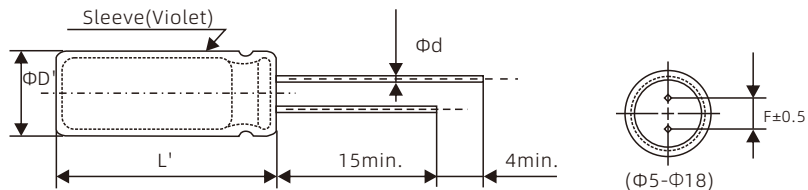
- Endurance: 4,000~ 10,000 hours at 105°C
- Low impedance, high ripple current, long life
- High performance, high reliability
- RoHS Compliant



SPECIFICATIONS

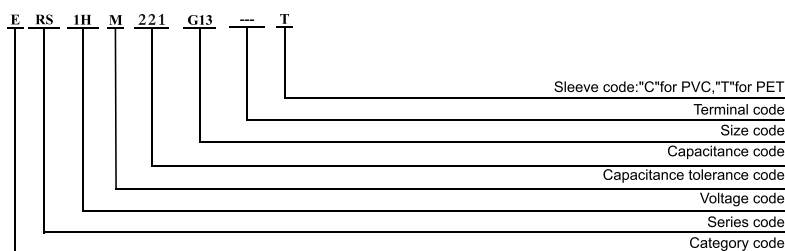
Items	Characteristics													
Category Temperature Range	-40~+105℃													
Rated Voltage Range	6.3~120Vdc													
Capacitance Tolerance	±20%(M) (at 20℃,120Hz)													
Leakage Current	I ≤0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)													
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	80	100	120	(at 20℃,120Hz)		
	Dissipation Factor(Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.08	0.12			
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.													
Low Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	80	100	120	(120Hz)		
	Z(-25℃)/ Z(+20℃)	4	3	2										3
	Z(-40℃)/ Z(+20℃)	8	6	4	3						6			
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20℃ after DC voltage plus rated ripple current is applied for a specified period of time at 105℃.									Case Dia.	Life time (hours)			
											6.3~10V	16~120V		
	Capacitance Change	≤±20% of the initial value(6.3V, 10V: ≤±30%)									ØD≤6.3	4,000	5,000	
	Dissipation Factor	≤200% of the initial specified value									ØD=8&10	6,000	7,000	
	Leakage Current	≤The initial specified value									ØD≥ 12.5	8,000	10,000	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after leaving them under no load at 105℃ for 1,000 hours.													
	Capacitance Change	≤±20% of the initial value(6.3V, 10V: ≤±30%)												
	Dissipation Factor	≤200% of the initial specified value												
	Leakage Current	≤200% of the initial specified value												

DIMENSIONS [mm]



ØD	5	6.3	8	10	12.5	13	16	18
Ød	0.5	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	7.5
ØD'	ØD+0.5max.							
L'	L+2max.							

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	Freq. (Hz)	120	1K	10K	100K
Cap. <220		0.40	0.75	0.90	1.00
220≤Cap. <680		0.50	0.85	0.94	1.00
680≤Cap. <2,200		0.60	0.87	0.95	1.00
2,200≤Cap. <4,700		0.75	0.90	0.95	1.00
Cap. ≥4,700		0.85	0.95	0.98	1.00

RS series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Impeance (Ωmax/20°C, 100kHz)	Rated Ripple Current (mA rms/105°C, 100kHz)	Part Number
6.3	150	5×11	0.570	200	ERS0JM151D11---T
	220	6.3×9	0.480	220	ERS0JM221E09---T
	330	6.3×11	0.210	350	ERS0JM331E11---T
	470	6.3×12	0.150	350	ERS0JM471E12---T
	680	8×12	0.130	660	ERS0JM681F12---T
	820	10×13	0.080	870	ERS0JM821G13---T
	1,000	8×16	0.086	850	ERS0JM102F16---T
	1,500	10×20	0.046	1,400	ERS0JM152G20---T
	1,800	12.5×16	0.049	1,450	ERS0JM182W16---T
	2,200	10×20	0.042	1,650	ERS0JM222G20---T
	3,300	10×25	0.038	1,800	ERS0JM332G25---T
	3,300	12.5×20	0.035	1,910	ERS0JM332W20---T
	3,900	12.5×25	0.026	2,230	ERS0JM392W25---T
	4,700	12.5×30	0.024	2,650	ERS0JM472W30---T
	5,600	12.5×35	0.020	2,880	ERS0JM562W35---T
	5,600	16×20	0.027	2,530	ERS0JM562L20---T
	6,800	12.5×40	0.017	3,350	ERS0JM682W40---T
	6,800	16×25	0.020	2,930	ERS0JM682L25---T
	6,800	18×20	0.026	2,860	ERS0JM682M20---T
	8,200	16×30	0.017	3,450	ERS0JM822L30---T
	10,000	16×35	0.015	3,610	ERS0JM103L35---T
	10,000	18×25	0.019	3,140	ERS0JM103M25---T
	12,000	16×40	0.013	4,100	ERS0JM123L40---T
	12,000	18×30	0.015	4,170	ERS0JM123M30---T
	15,000	18×35	0.014	4,220	ERS0JM153M35---T
	18,000	18×40	0.012	4,300	ERS0JM183M40---T
10	100	5×11	0.570	200	ERS1AM101D11---T
	220	6.3×11	0.210	350	ERS1AM221E11---T
	330	6.3×12	0.190	400	ERS1AM331E12---T
	470	8×12	0.130	660	ERS1AM471F12---T
	680	8×16	0.086	850	ERS1AM681F16---T
	680	10×13	0.080	870	ERS1AM681G13---T
	1,000	8×20	0.069	1,050	ERS1AM102F20---T
	1,000	10×16	0.060	1,230	ERS1AM102G16---T
	1,200	10×20	0.046	1,400	ERS1AM122G20---T
	1,500	10×25	0.042	1,650	ERS1AM152G25---T
	1,500	12.5×16	0.049	1,450	ERS1AM152W16---T
	2,200	10×25	0.040	1,640	ERS1AM222G25---T
	2,200	12.5×20	0.035	1,910	ERS1AM222W20---T
	2,200	16×15	0.041	1,950	ERS1AM222L15---T
	3,300	12.5×25	0.031	2,230	ERS1AM332W25---T
	3,900	12.5×30	0.029	2,650	ERS1AM392W30---T

RS series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
10	3,900	16×20	0.027	2,530	ERS1AM392L20---T
	4,700	12.5×35	0.020	2,880	ERS1AM472W35---T
	5,600	12.5×40	0.017	3,350	ERS1AM562W40---T
	5,600	16×25	0.021	2,930	ERS1AM562L25---T
	5,600	18×20	0.026	2,860	ERS1AM562M20---T
	6,800	16×30	0.017	3,450	ERS1AM682L30---T
	6,800	18×25	0.019	3,140	ERS1AM682M25---T
	8,200	16×35	0.015	3,610	ERS1AM822L35---T
	8,200	18×30	0.015	4,170	ERS1AM822M30---T
	10,000	16×40	0.013	4,100	ERS1AM103L40---T
	10,000	18×35	0.014	4,220	ERS1AM103M35---T
	12,000	18×40	0.012	4,300	ERS1AM123M40---T
16	56	5×11	0.570	200	ERS1CM560D11---T
	100	5×11	0.550	272	ERS1CM101D11---T
	120	6.3×11	0.210	350	ERS1CM121E11---T
	220	6.3×11	0.140	450	ERS1CM221E11---T
	330	8×12	0.130	660	ERS1CM331F12---T
	470	8×12	0.130	800	ERS1CM471F12---T
	470	8×16	0.087	850	ERS1CM471F16---T
	470	10×13	0.080	870	ERS1CM471G13---T
	680	8×16	0.100	976	ERS1CM681F16---T
	680	10×16	0.060	1,230	ERS1CM681G16---T
	1,000	10×16	0.075	1,269	ERS1CM102G16---T
	1,000	10×20	0.046	1,400	ERS1CM102G20---T
	1,200	10×25	0.042	1,650	ERS1CM122G25---T
	1,500	12.5×20	0.035	1,910	ERS1CM152W20---T
	2,200	12.5×20	0.031	1,720	ERS1CM222W20---T
	3,300	12.5×35	0.024	2,880	ERS1CM332W35---T
	3,900	12.5×40	0.021	3,350	ERS1CM392W40---T
	3,900	16×25	0.021	2,930	ERS1CM392L25---T
	3,900	18×20	0.026	2,860	ERS1CM392M20---T
	4,700	16×30	0.017	3,450	ERS1CM472L30---T
	4,700	18×25	0.019	3,140	ERS1CM472M25---T
	5,600	16×35	0.015	3,610	ERS1CM562L35---T
	5,600	18×30	0.015	4,170	ERS1CM562M30---T
	6,800	16×40	0.013	4,100	ERS1CM682L40---T
	8,200	18×35	0.014	4,220	ERS1CM822M35---T
	10,000	18×40	0.012	4,300	ERS1CM103M40---T
25	47	5×11	0.570	200	ERS1EM470D11---T
	47	6.3×9	0.740	180	ERS1EM470E09---T
	100	6.3×11	0.210	350	ERS1EM101E11---T
	220	8×12	0.130	660	ERS1EM221F12---T

RS series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
25	330	8×12	0.100	700	ERS1EM331F12---T
	330	8×16	0.086	850	ERS1EM331F16---T
	330	10×13	0.080	870	ERS1EM331G13---T
	470	8×16	0.075	950	ERS1EM471F16---T
	470	8×20	0.069	1,050	ERS1EM471F20---T
	470	10×16	0.060	1,230	ERS1EM471G16---T
	680	10×20	0.046	1,400	ERS1EM681G20---T
	680	12.5×16	0.049	1,450	ERS1EM681W16---T
	820	10×25	0.042	1,650	ERS1EM821G25---T
	1,000	10×30	0.035	1,920	ERS1EM102G30---T
	1,000	12.5×20	0.035	1,910	ERS1EM102W20---T
	1,500	12.5×25	0.032	2,230	ERS1EM152W25---T
	2,200	12.5×25	0.030	2,230	ERS1EM222W25---T
	2,200	18×20	0.026	2,860	ERS1EM222M20---T
	3,300	16×30	0.017	3,450	ERS1EM332L30---T
	3,300	18×25	0.019	3,140	ERS1EM332M25---T
	4,700	16×40	0.013	4,100	ERS1EM472L40---T
	4,700	18×35	0.014	4,220	ERS1EM472M35---T
35	5,600	18×40	0.012	4,300	ERS1EM562M40---T
	33	5×11	0.570	200	ERS1VM330D11---T
	33	6.3×9	0.740	180	ERS1VM330E09---T
	56	6.3×11	0.210	350	ERS1VM560E11---T
	100	6.3×12	0.250	400	ERS1VM101E12---T
	150	8×9	0.170	560	ERS1VM151F09---T
	150	8×12	0.130	660	ERS1VM151F12---T
	220	8×12	0.100	660	ERS1VM221F12---T
	220	8×16	0.086	850	ERS1VM221F16---T
	220	10×13	0.080	870	ERS1VM221G13---T
	330	10×16	0.060	1,230	ERS1VM331G16---T
	470	10×20	0.046	1,400	ERS1VM471G20---T
	560	10×20	0.060	1,400	ERS1VM561G20---T
	560	10×25	0.042	1,650	ERS1VM561G25---T
	680	10×20	0.042	1,700	ERS1VM681G20---T
	680	12.5×20	0.035	1,910	ERS1VM681W20---T
	1,000	12.5×20	0.030	2,210	ERS1VM102W20---T
	1,200	12.5×25	0.032	2,200	ERS1VM122W25---T
	1,200	16×20	0.028	2,247	ERS1VM122L20---T
	1,500	12.5×25	0.032	2,250	ERS1VM152W25---T
	1,500	13×20	0.035	2,050	ERS1VM152K20---T
	1,800	16×20	0.030	2,930	ERS1VM182L20---T
	2,200	16×25	0.030	2,980	ERS1VM222L25---T
	2,200	16×30	0.022	3,450	ERS1VM222L30---T

RS series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
35	2,200	18×25	0.019	3,140	ERS1VM222M25---T
	2,700	16×25	0.030	3,410	ERS1VM272L25---T
	2,700	16×35	0.015	3,610	ERS1VM272L35---T
	3,300	16×40	0.012	4,100	ERS1VM332L40---T
	3,300	18×35	0.014	4,220	ERS1VM332M35---T
	3,900	18×40	0.011	4,300	ERS1VM392M40---T
50	22	5×12	0.680	190	ERS1HM220D12---T
	22	6.3×9	0.890	170	ERS1HM220E09---T
	47	6.3×11	0.350	260	ERS1HM470E11---T
	56	6.3×11	0.300	300	ERS1HM560E11---T
	100	8×12	0.170	560	ERS1HM101F12---T
	100	10×9	0.220	500	ERS1HM101G09---T
	150	8×12	0.180	560	ERS1HM151F12---T
	150	10×13	0.120	760	ERS1HM151G13---T
	180	8×20	0.090	910	ERS1HM181F20---T
	220	10×13	0.120	760	ERS1HM221G13---T
	220	10×16	0.084	1,050	ERS1HM221G16---T
	270	10×13	0.150	650	ERS1HM271G13---T
	330	10×16	0.065	1,150	ERS1HM331G16---T
	470	10×20	0.055	1,500	ERS1HM471G20---T
	470	12.5×20	0.045	1,660	ERS1HM471W20---T
	470	16×15	0.055	1,690	ERS1HM471L15---T
	560	12.5×16	0.060	1,520	ERS1HM561W16---T
	560	12.5×25	0.034	1,960	ERS1HM561W25---T
	680	12.5×20	0.045	1,720	ERS1HM681W20---T
	680	12.5×25	0.035	2,022	ERS1HM681W25---T
	820	12.5×20	0.045	1,800	ERS1HM821W20---T
	820	12.5×25	0.035	2,030	ERS1HM821W25---T
	820	16×20	0.034	2,210	ERS1HM821L20---T
	1,000	12.5×25	0.035	2,030	ERS1HM102W25---T
	1,000	16×25	0.025	2,560	ERS1HM102L25---T
	1,200	16×25	0.032	2,600	ERS1HM122L25---T
	1,200	18×20	0.036	2,490	ERS1HM122M20---T
	1,500	18×25	0.028	2,740	ERS1HM152M25---T
	1,800	16×40	0.016	3,710	ERS1HM182L40---T
	1,800	18×30	0.021	3,640	ERS1HM182M30---T
	2,200	18×35	0.017	3,680	ERS1HM222M35---T
	2,700	18×40	0.014	3,800	ERS1HM272M40---T
63	15	5×11	1.800	165	ERS1JM150D11---T
	15	6.3×9	1.150	145	ERS1JM150E09---T
	33	6.3×12	1.000	265	ERS1JM330E12---T
	47	6.3×12	0.800	300	ERS1JM470E12---T

RS series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
63	56	8×12	0.500	500	ERS1JM560F12---T
	100	8×12	0.450	550	ERS1JM101F12---T
	100	10×13	0.350	580	ERS1JM101G13---T
	120	10×13	0.330	600	ERS1JM121G13---T
	180	10×16	0.310	650	ERS1JM181G16---T
	220	10×16	0.160	680	ERS1JM221G16---T
	220	10×20	0.160	700	ERS1JM221G20---T
	330	12.5×20	0.096	1,500	ERS1JM331W20---T
	390	12.5×25	0.090	1,900	ERS1JM391W25---T
	470	12.5×25	0.088	1,950	ERS1JM471W25---T
	470	16×20	0.080	2,000	ERS1JM471L20---T
	560	12.5×30	0.077	2,060	ERS1JM561W30---T
	680	12.5×30	0.077	2,060	ERS1JM681W30---T
	680	16×20	0.070	2,150	ERS1JM681L20---T
	820	18×20	0.065	2,300	ERS1JM821M20---T
	1,000	18×25	0.042	2,900	ERS1JM102M25---T
	1,200	16×40	0.028	3,400	ERS1JM122L40---T
	1,200	18×30	0.036	3,300	ERS1JM122M30---T
80	1,500	18×35	0.032	3,400	ERS1JM152M35---T
	1,800	18×40	0.030	3,500	ERS1JM182M40---T
	68	8×12	0.400	340	ERS1BM680F12---T
	100	8×16	0.270	460	ERS1BM101F16---T
	100	10×13	0.250	490	ERS1BM101G13---T
	120	10×13	0.220	520	ERS1BM121G13---T
	150	10×16	0.210	520	ERS1BM151G16---T
	150	12.5×13	0.200	580	ERS1BM151W13---T
	220	10×20	0.130	850	ERS1BM221G20---T
	220	12.5×20	0.100	1,100	ERS1BM221W20---T
	330	12.5×20	0.090	1,150	ERS1BM331W20---T
	330	12.5×25	0.090	1,250	ERS1BM331W25---T
	470	12.5×25	0.072	1,300	ERS1BM471W25---T
	470	16×20	0.070	1,350	ERS1BM471L20---T
	680	16×25	0.068	1,600	ERS1BM681L25---T
	820	18×25	0.060	1,750	ERS1BM821M25---T
	1,000	16×40	0.050	2,200	ERS1BM102L40---T
	1,000	18×35	0.050	2,200	ERS1BM102M35---T
100	1,200	18×40	0.040	2,700	ERS1BM122M40---T
	6.8	5×11	1.400	125	ERS1KM6R8D11---T
	10	6.3×11	1.200	140	ERS1KM100E11---T
	22	6.3×12	0.900	150	ERS1KM220E12---T
	22	8×12	0.900	197	ERS1KM220F12---T
	27	8×12	0.630	260	ERS1KM270F12---T

RS series

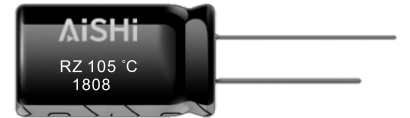
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Impeance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
100	47	8×12	0.560	300	ERS1KM470F12---T
	47	10×13	0.340	480	ERS1KM470G13---T
	68	8×16	0.310	500	ERS1KM680F16---T
	68	10×13	0.320	490	ERS1KM680G13---T
	82	10×13	0.280	525	ERS1KM820G13---T
	82	10×16	0.180	550	ERS1KM820G16---T
	100	10×16	0.180	550	ERS1KM101G16---T
	100	10×20	0.170	560	ERS1KM101G20---T
	120	12.5×16	0.160	700	ERS1KM121W16---T
	150	10×20	0.160	700	ERS1KM151G20---T
	150	12.5×20	0.140	895	ERS1KM151W20---T
	220	12.5×25	0.080	1,250	ERS1KM221W25---T
	220	13×20	0.140	895	ERS1KM221K20---T
	270	12.5×30	0.070	1,500	ERS1KM271W30---T
	330	12.5×30	0.070	1,500	ERS1KM331W30---T
	330	16×20	0.068	1,550	ERS1KM331L20---T
	470	16×25	0.050	1,640	ERS1KM471L25---T
	680	16×35	0.042	1,850	ERS1KM681L35---T
	820	18×30	0.032	2,080	ERS1KM821M30---T
120	10	6.3×11	6.000	85	ERS2BM100E11---T
	15	6.3×12	5.000	110	ERS2BM150E12---T
	22	8×12	4.000	140	ERS2BM220F12---T
	33	8×16	3.500	245	ERS2BM330F16---T
	33	10×13	3.500	245	ERS2BM330G13---T
	47	8×20	2.800	300	ERS2BM470F20---T
	47	10×16	2.800	315	ERS2BM470G16---T
	56	10×16	2.500	315	ERS2BM560G16---T
	68	10×16	2.200	315	ERS2BM680G16---T
	82	10×20	2.000	330	ERS2BM820G20---T
	100	10×25	1.700	410	ERS2BM101G25---T
	120	12.5×20	1.500	470	ERS2BM121W20---T
	150	12.5×25	1.000	620	ERS2BM151W25---T
	220	12.5×30	0.850	760	ERS2BM221W30---T
	220	16×20	0.850	760	ERS2BM221L20---T
	270	16×25	0.600	860	ERS2BM271L25---T
	270	18×20	0.600	860	ERS2BM271M20---T
	330	16×30	0.460	930	ERS2BM331L30---T
	330	18×25	0.460	930	ERS2BM331M25---T
	470	16×40	0.330	1,035	ERS2BM471L40---T
	470	18×30	0.330	1,035	ERS2BM471M30---T

※Specifications subject to change without notice

RZ series

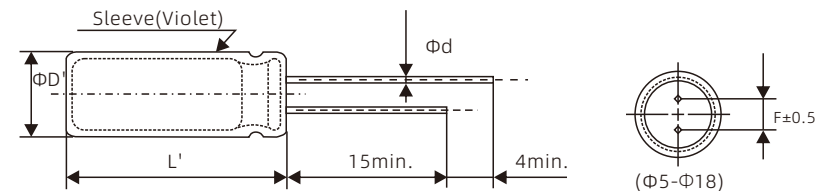
- Endurance: 6,000~10,000 hours at 105°C
- High ripple, high reliability
- Miniaturized, long life, low impedance
- RoHS Compliant



SPECIFICATIONS

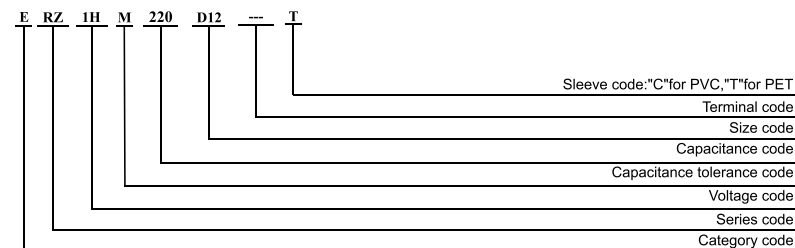
Items	Characteristics								
Category Temperature Range	-40--+105°C								
Rated Working Voltage Range	6.3~50 Vdc								
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)								
Leakage Current	I≤0.01CV or 3μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)								
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	10	16	25	35	50		
	tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10		
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C,120Hz)								
Low Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage(Vdc)	6.3	10	16~50					
	Z(-25°C)/Z(+20°C)	3							
	Z(-40°C)/Z(+20°C)	6	4	3					
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for the specified period of time at 105°C.								
							Case size	Load life (hours)	
	Capacitance Change	≤ ±25% of the initial value (6.3,10V: ≤ ±30%)					ØD≤6.3	6,000	
	Dissipation Factor	≤ 200% of the initial specified value					ØD=8	8,000	
	Leakage Current	≤ The initial specified value					ØD≥10	10,000	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.								
	Capacitance Change	≤ ±25% of the initial value (6.3,10V: ≤ ±30%)							
	Dissipation Factor	≤ 200% of the initial specified value							
	Leakage Current	≤ 200% of the initial specified value							

DIMENSIONS [mm]



ΦD	5	6.3	8	10	12.5	16	18
Φd	0.5	0.5	0.5	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ΦD'	ΦD+0.5max.						
L'	L+2max.						

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	Freq. (Hz)	120	1K	10K	100K
Cap. <220		0.40	0.75	0.90	1.00
220≤Cap. <680		0.50	0.85	0.94	1.00
680≤Cap. <2,200		0.60	0.87	0.95	1.00
2,200≤Cap. <4,700		0.75	0.90	0.95	1.00
Cap. ≥4,700		0.85	0.95	0.98	1.00

RZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
6.3	220	5×12	0.22	345	ERZ0JM221D12---T
	220	6.3×9	0.30	310	ERZ0JM221E09---T
	470	6.3×12	0.094	540	ERZ0JM471E12---T
	470	8×9	0.120	485	ERZ0JM471F09---T
	820	8×12	0.056	945	ERZ0JM821F12---T
	820	10×9	0.072	850	ERZ0JM821G09---T
	1,200	8×16	0.045	1,250	ERZ0JM122F16---T
	1,200	10×13	0.039	1,330	ERZ0JM122G13---T
	1,500	8×20	0.029	1,500	ERZ0JM152F20---T
	1,800	10×16	0.028	1,760	ERZ0JM182G16---T
	2,200	10×20	0.020	1,960	ERZ0JM222G20---T
	2,700	10×25	0.018	2,250	ERZ0JM272G25---T
	3,900	12.5×20	0.017	2,480	ERZ0JM392W20---T
	4,700	12.5×25	0.015	2,900	ERZ0JM472W25---T
	5,600	12.5×30	0.013	3,450	ERZ0JM562W30---T
	6,800	12.5×35	0.012	3,570	ERZ0JM682W35---T
	6,800	16×20	0.015	3,250	ERZ0JM682L20---T
	8,200	16×25	0.013	3,630	ERZ0JM822L25---T
	10,000	18×25	0.012	3,650	ERZ0JM103M25---T
10	150	5×12	0.22	345	ERZ1AM151D12---T
	150	6.3×9	0.30	310	ERZ1AM151E09---T
	330	6.3×12	0.094	540	ERZ1AM331E12---T
	330	8×9	0.120	485	ERZ1AM331F09---T
	680	8×11	0.056	945	ERZ1AM681F11---T
	680	10×9	0.072	850	ERZ1AM681G09---T
	1,000	8×16	0.045	1,250	ERZ1AM102F16---T
	1,000	10×13	0.039	1,330	ERZ1AM102G13---T
	1,500	8×20	0.029	1,500	ERZ1AM152F20---T
	1,500	10×16	0.028	1,760	ERZ1AM152G16---T
	1,800	10×20	0.024	1,960	ERZ1AM182G20---T
	2,200	10×25	0.021	2,250	ERZ1AM222G25---T
	3,300	12.5×20	0.020	2,480	ERZ1AM332W20---T
	3,900	12.5×25	0.018	2,900	ERZ1AM392W25---T
	4,700	12.5×30	0.018	3,450	ERZ1AM472W30---T
	4,700	16×20	0.020	3,250	ERZ1AM472L20---T
	5,600	12.5×35	0.017	3,570	ERZ1AM562W35---T
	6,800	16×25	0.018	3,630	ERZ1AM682L25---T
	8,200	18×25	0.017	3,650	ERZ1AM822M25---T
16	100	5×12	0.22	345	ERZ1CM101D12---T
	100	6.3×9	0.30	310	ERZ1CM101E09---T
	220	6.3×12	0.094	540	ERZ1CM221E12---T
	220	8×9	0.120	485	ERZ1CM221F09---T

RZ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
16	470	8×12	0.056	945	ERZ1CM471F12---T
	470	10×9	0.072	850	ERZ1CM471G09---T
	680	8×16	0.045	1,250	ERZ1CM681F16---T
	680	10×13	0.039	1,330	ERZ1CM681G13---T
	1,000	8×20	0.029	1,500	ERZ1CM102F20---T
	1,000	10×16	0.028	1,760	ERZ1CM102G16---T
	1,500	10×20	0.024	1,960	ERZ1CM152G20---T
	1,800	10×25	0.021	2,250	ERZ1CM182G25---T
	2,200	12.5×20	0.020	2,480	ERZ1CM222W20---T
	2,700	12.5×25	0.018	2,900	ERZ1CM272W25---T
	3,300	12.5×30	0.018	3,450	ERZ1CM332W30---T
	3,300	16×20	0.020	3,250	ERZ1CM332L20---T
	3,900	12.5×35	0.017	3,570	ERZ1CM392W35---T
	4,700	16×25	0.018	3,630	ERZ1CM472L25---T
	5,600	18×25	0.017	3,650	ERZ1CM562M25---T
25	68	5×12	0.22	345	ERZ1EM680D12---T
	68	6.3×9	0.30	310	ERZ1EM680E09---T
	150	6.3×12	0.094	540	ERZ1EM151E12---T
	150	8×9	0.120	485	ERZ1EM151F09---T
	330	8×12	0.056	945	ERZ1EM331F12---T
	330	10×9	0.072	850	ERZ1EM331G09---T
	390	8×16	0.045	1,250	ERZ1EM391F16---T
	470	10×13	0.039	1,330	ERZ1EM471G13---T
	560	8×20	0.029	1,500	ERZ1EM561F20---T
	680	10×16	0.028	1,760	ERZ1EM681G16---T
	820	10×20	0.024	1,960	ERZ1EM821G20---T
	1,000	10×25	0.021	2,250	ERZ1EM102G25---T
	1,500	12.5×20	0.020	2,480	ERZ1EM152W20---T
	1,800	12.5×25	0.020	2,900	ERZ1EM182W25---T
	2,200	12.5×30	0.018	3,450	ERZ1EM222W30---T
	2,200	16×20	0.020	3,250	ERZ1EM222L20---T
	2,700	12.5×35	0.017	3,570	ERZ1EM272W35---T
	3,300	16×25	0.018	3,630	ERZ1EM332L25---T
	3,900	18×25	0.017	3,650	ERZ1EM392M25---T
35	47	5×12	0.22	345	ERZ1VM470D12---T
	47	6.3×9	0.30	310	ERZ1VM470E09---T
	100	6.3×12	0.094	540	ERZ1VM101E12---T
	100	8×9	0.120	485	ERZ1VM101F09---T
	220	8×16	0.056	945	ERZ1VM221F16---T
	270	8×20	0.045	1,250	ERZ1VM271F20---T
	330	10×13	0.039	1,330	ERZ1VM331G13---T
	390	8×20	0.029	1,500	ERZ1VM391F20---T

Radial Type

RZ series

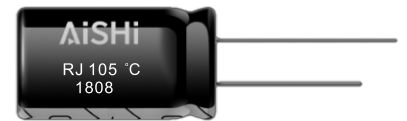
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
35	470	10×16	0.028	1,760	ERZ1VM471G16---T
	560	10×20	0.024	1,960	ERZ1VM561G20---T
	680	10×25	0.021	2,250	ERZ1VM681G25---T
	1,000	12.5×20	0.020	2,480	ERZ1VM102W20---T
	1,200	12.5×25	0.020	2,900	ERZ1VM122W25---T
	1,500	12.5×30	0.018	3,450	ERZ1VM152W30---T
	1,500	16×20	0.020	3,250	ERZ1VM152L20---T
	1,800	12.5×35	0.017	3,570	ERZ1VM182W35---T
	2,200	16×25	0.018	3,630	ERZ1VM222L25---T
	2,700	18×25	0.017	3,650	ERZ1VM272M25---T
50	22	5×12	0.34	238	ERZ1HM220D12---T
	22	6.3×9	0.44	214	ERZ1HM220E09---T
	56	6.3×12	0.14	385	ERZ1HM560E12---T
	56	8×9	0.18	345	ERZ1HM560F09---T
	100	8×12	0.074	724	ERZ1HM101F12---T
	100	10×9	0.096	650	ERZ1HM101G09---T
	120	8×16	0.061	950	ERZ1HM121F16---T
	150	10×13	0.061	979	ERZ1HM151G13---T
	180	8×20	0.046	1,190	ERZ1HM181F20---T
	220	10×16	0.042	1,370	ERZ1HM221G16---T
	270	10×20	0.030	1,580	ERZ1HM271G20---T
	330	10×25	0.028	1,870	ERZ1HM331G25---T
	470	12.5×20	0.027	2,050	ERZ1HM471W20---T
	560	12.5×25	0.023	2,410	ERZ1HM561W25---T
	680	12.5×30	0.021	2,860	ERZ1HM681W30---T
	820	12.5×35	0.019	2,960	ERZ1HM821W35---T
	820	16×20	0.023	2,730	ERZ1HM821L20---T
	1,000	16×25	0.021	3,010	ERZ1HM102L25---T
	1,500	18×25	0.019	3,290	ERZ1HM152M25---T

※ Specifications subject to change without notice

RJ series

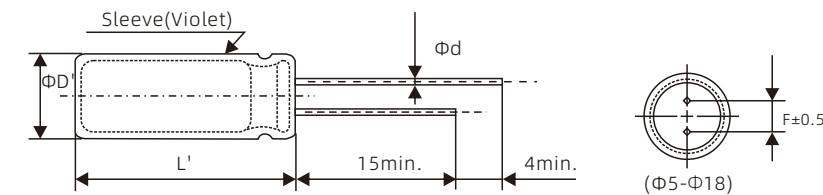
- Endurance : 8,000~ 12,000 hours at 105°C
- Low impedance, high ripple current, long life
- Miniaturized
- RoHS Compliant



SPECIFICATIONS

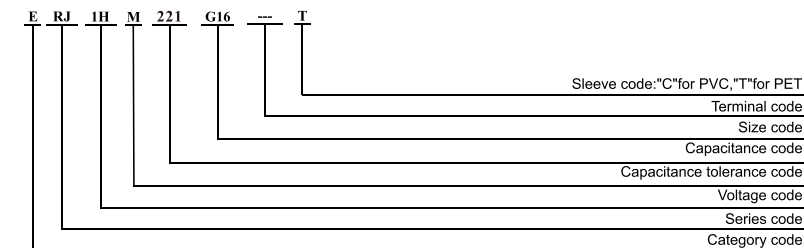
Items	Characteristics											
Category Temperature Range	-40~+105°C											
Rated Voltage Range	10~120Vdc											
Capacitance Tolerance	±20%(M)											(at 20°C,120Hz)
Leakage Current	I ≤0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)											(at 20°C after 2 minutes)
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	10	16	25	35	50	63	80	100	120	(at 20°C,120Hz)	
	Dissipation Factor(Max.)	0.19	0.16	0.14	0.12	0.10	0.09	0.09	0.08	0.12		
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.											
Low Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage (Vdc)	10	16	25	35	50	63	80	100	120	(120Hz)	
	Z(-25°C)/ Z(+20°C)	2								3		
	Z(-40°C)/ Z(+20°C)	4	3						6			
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for a specified period of time at 105°C.										Case Dia	Life time (hours)
	Capacitance Change	≤±25% of the initial value (6.3V, 10V: ≤±30%)									ØD≤6.3	8,000
	Dissipation Factor	≤200% of the initial specified value									ØD=8&10	10,000
	Leakage Current	≤The initial specified value									ØD≥ 12.5	12,000
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.											
	Capacitance Change	≤±25% of the initial value (6.3V, 10V: ≤±30%)										
	Dissipation Factor	≤200% of the initial specified value										
	Leakage Current	≤ 200% of the initial specified value										

DIMENSIONS [mm]



ØD	5	6.3	8	10	12.5	16	18
Ød	0.5	0.5	0.5	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ØD'	ØD+0.5max.						
L'	L+2max.						

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	Freq. (Hz)	120	1K	10K	100K
Cap. < 47		0.42	0.70	0.90	1.00
47 ≥ Cap. < 330		0.50	0.73	0.92	1.00
330 ≤ Cap. < 820		0.55	0.77	0.94	1.00
820 ≤ Cap. < 2,200		0.60	0.80	0.96	1.00
Cap. ≥ 2,200		0.70	0.85	0.98	1.00

RJ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
10	150	5×12	0.400	450	ERJ1AM151D12---T
	330	6.3×12	0.170	700	ERJ1AM331E12---T
	560	8×12	0.075	1,200	ERJ1AM561F12---T
	680	8×16	0.059	1,600	ERJ1AM681F16---T
	820	10×13	0.053	1,700	ERJ1AM821G13---T
	1,000	8×20	0.041	1,960	ERJ1AM102F20---T
	1,200	10×16	0.038	2,000	ERJ1AM122G16---T
	1,800	10×20	0.028	2,500	ERJ1AM182G20---T
	2,200	10×25	0.024	2,900	ERJ1AM222G25---T
	2,700	12.5×20	0.025	2,600	ERJ1AM272W20---T
	3,300	12.5×25	0.019	3,200	ERJ1AM332W25---T
	4,700	12.5×30	0.018	3,660	ERJ1AM472W30---T
	4,700	16×20	0.021	3,330	ERJ1AM472L20---T
	5,600	12.5×35	0.016	4,120	ERJ1AM562W35---T
	5,600	16×25	0.017	3,810	ERJ1AM562L25---T
16	120	5×11	0.400	450	ERJ1CM121D11---T
	270	6.3×12	0.170	700	ERJ1CM271E12---T
	270	8×9	0.220	590	ERJ1CM271F09---T
	470	8×12	0.075	1,200	ERJ1CM471F12---T
	560	8×16	0.059	1,600	ERJ1CM561F16---T
	680	10×13	0.053	1,700	ERJ1CM681G13---T
	820	8×20	0.041	1,960	ERJ1CM821F20---T
	1,000	10×16	0.038	2,000	ERJ1CM102G16---T
	1,500	10×20	0.028	2,500	ERJ1CM152G20---T
	1,800	10×25	0.024	2,900	ERJ1CM182G25---T
	2,200	12.5×20	0.025	2,600	ERJ1CM222W20---T
	2,700	12.5×25	0.019	3,200	ERJ1CM272W25---T
	3,300	12.5×30	0.018	3,660	ERJ1CM332W30---T
	3,300	16×20	0.021	3,330	ERJ1CM332L20---T
	3,900	12.5×35	0.016	4,120	ERJ1CM392W35---T
	4,700	16×25	0.017	3,810	ERJ1CM472L25---T
25	68	5×11	0.400	450	ERJ1EM680D11---T
	100	5×12	0.300	460	ERJ1EM101D12---T
	100	6.3×11	0.220	550	ERJ1EM101E11---T
	150	6.3×11	0.170	700	ERJ1EM151E11---T
	220	6.3×12	0.170	700	ERJ1EM221E12---T
	330	8×12	0.075	1,200	ERJ1EM331F12---T
	330	10×9	0.097	1,020	ERJ1EM331G09---T
	390	8×16	0.059	1,600	ERJ1EM391F16---T
	470	8×16	0.059	1,600	ERJ1EM471F16---T
	470	10×13	0.053	1,700	ERJ1EM471G13---T
	560	8×20	0.041	1,960	ERJ1EM561F20---T

RJ series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
25	680	10×16	0.038	2,000	ERJ1EM681G16---T
	1,000	10×20	0.028	2,500	ERJ1EM102G20---T
	1,200	10×25	0.024	2,900	ERJ1EM122G25---T
	1,500	12.5×20	0.025	2,600	ERJ1EM152W20---T
	1,800	12.5×25	0.019	3,200	ERJ1EM182W25---T
	2,200	12.5×30	0.018	3,660	ERJ1EM222W30---T
	2,200	16×20	0.021	3,330	ERJ1EM222L20---T
	2,700	12.5×35	0.016	4,120	ERJ1EM272W35---T
	3,300	16×25	0.017	3,810	ERJ1EM332L25---T
35	47	5×11	0.400	450	ERJ1VM470D11---T
	47	6.3×9	0.520	380	ERJ1VM470E09---T
	68	5×12	0.400	460	ERJ1VM680D12---T
	100	6.3×11	0.170	700	ERJ1VM101E11---T
	100	8×9	0.220	590	ERJ1VM101F09---T
	180	8×12	0.075	1,200	ERJ1VM181F12---T
	220	8×12	0.075	1,210	ERJ1VM221F12---T
	220	8×16	0.059	1,600	ERJ1VM221F16---T
	270	10×13	0.053	1,700	ERJ1VM271G13---T
	330	8×20	0.041	1,960	ERJ1VM331F20---T
	330	10×13	0.052	1,780	ERJ1VM331G13---T
	390	10×16	0.038	2,000	ERJ1VM391G16---T
	560	10×20	0.028	2,500	ERJ1VM561G20---T
	680	10×25	0.024	2,900	ERJ1VM681G25---T
	820	12.5×20	0.025	2,600	ERJ1VM821W20---T
	1,200	12.5×25	0.019	3,200	ERJ1VM122W25---T
	1,500	12.5×30	0.018	3,660	ERJ1VM152W30---T
	1,500	16×20	0.021	3,330	ERJ1VM152L20---T
	1,800	12.5×35	0.016	4,120	ERJ1VM182W35---T
	1,800	16×25	0.017	3,810	ERJ1VM182L25---T
50	22	5×11	0.420	255	ERJ1HM220D11---T
	47	6.3×11	0.300	320	ERJ1HM470E11---T
	56	6.3×11	0.220	500	ERJ1HM560E11---T
	56	8×9	0.290	425	ERJ1HM560F09---T
	100	8×12	0.120	950	ERJ1HM101F12---T
	100	10×9	0.160	800	ERJ1HM101G09---T
	120	8×16	0.082	1,230	ERJ1HM121F16---T
	150	8×12	0.120	950	ERJ1HM151F12---T
	150	10×13	0.073	1,280	ERJ1HM151G13---T
	180	8×20	0.058	1,580	ERJ1HM181F20---T
	220	10×13	0.072	1,290	ERJ1HM221G13---T
	220	10×16	0.053	1,650	ERJ1HM221G16---T
	330	10×16	0.053	1,650	ERJ1HM331G16---T

RJ series

■ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
50	330	10×20	0.038	2,060	ERJ1HM331G20---T
	390	10×25	0.032	2,420	ERJ1HM391G25---T
	470	10×20	0.038	2,060	ERJ1HM471G20---T
	470	12.5×20	0.032	2,300	ERJ1HM471W20---T
	680	12.5×25	0.025	2,800	ERJ1HM681W25---T
	820	12.5×30	0.023	3,370	ERJ1HM821W30---T
	820	16×20	0.026	3,070	ERJ1HM821L20---T
	1,000	12.5×35	0.021	3,810	ERJ1HM102W35---T
	1,000	16×25	0.022	3,510	ERJ1HM102L25---T
63	10	5×11	1.800	160	ERJ1JM100D11---T
	22	6.3×11	0.690	275	ERJ1JM220E11---T
	47	6.3×12	0.280	420	ERJ1JM470E12---T
	47	8×9	0.360	350	ERJ1JM470F09---T
	82	8×12	0.180	720	ERJ1JM820F12---T
	82	10×9	0.240	610	ERJ1JM820G09---T
	100	8×12	0.210	720	ERJ1JM101F12---T
	100	8×16	0.130	990	ERJ1JM101F16---T
	120	10×13	0.110	990	ERJ1JM121G13---T
	150	8×20	0.096	1,200	ERJ1JM151F20---T
	150	10×13	0.160	950	ERJ1JM151G13---T
	180	10×16	0.076	1,200	ERJ1JM181G16---T
	220	10×20	0.070	1,420	ERJ1JM221G20---T
	270	10×20	0.056	1,570	ERJ1JM271G20---T
	270	12.5×16	0.072	1,570	ERJ1JM271W16---T
	330	10×25	0.046	1,990	ERJ1JM331G25---T
	390	12.5×20	0.041	1,990	ERJ1JM391W20---T
	470	12.5×25	0.031	2,460	ERJ1JM471W25---T
	560	12.5×30	0.028	2,760	ERJ1JM561W30---T
	560	16×20	0.032	2,380	ERJ1JM561L20---T
	680	12.5×35	0.024	3,040	ERJ1JM681W35---T
	820	16×25	0.025	2,890	ERJ1JM821L25---T
	820	18×20	0.030	2,580	ERJ1JM821M20---T
80	12	5×11	1.200	220	ERJ1BM120D11---T
	27	6.3×11	0.460	370	ERJ1BM270E11---T
	47	8×12	0.290	620	ERJ1BM470F12---T
	47	10×9	0.380	520	ERJ1BM470G09---T
	56	8×16	0.200	780	ERJ1BM560F16---T
	68	10×13	0.170	780	ERJ1BM680G13---T
	82	8×20	0.160	1,040	ERJ1BM820F20---T
	100	10×13	0.200	750	ERJ1BM101G13---T
	100	10×16	0.110	1,040	ERJ1BM101G16---T
	150	10×20	0.084	1,430	ERJ1BM151G20---T

RJ series

■ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA rms/105°C,100kHz)	Part Number
80	150	12.5×16	0.110	1,430	ERJ1BM151W16---T
	180	10×25	0.069	1,620	ERJ1BM181G25---T
	220	12.5×20	0.062	1,750	ERJ1BM221W20---T
	270	12.5×25	0.047	2,210	ERJ1BM271W25---T
	330	12.5×30	0.042	2,400	ERJ1BM331W30---T
	330	16×20	0.048	1,950	ERJ1BM331L20---T
	390	12.5×35	0.036	2,600	ERJ1BM391W35---T
	470	12.5×40	0.032	2,860	ERJ1BM471W40---T
	470	16×25	0.038	2,430	ERJ1BM471L25---T
	470	18×20	0.045	2,270	ERJ1BM471M20---T
	560	16×30	0.032	2,640	ERJ1BM561L30---T
	680	16×35	0.029	2,860	ERJ1BM681L35---T
	680	18×25	0.036	2,500	ERJ1BM681M25---T
	820	16×40	0.027	3,510	ERJ1BM821L40---T
	820	18×30	0.030	2,860	ERJ1BM821M30---T
	1,000	18×35	0.027	3,510	ERJ1BM102M35---T
	1,200	18×40	0.026	3,860	ERJ1BM122M40---T
	100	8.2	5×11	1.200	220
18		6.3×11	0.460	370	ERJ1KM180E11---T
22		8×12	0.320	540	ERJ1KM220F12---T
33		8×12	0.290	620	ERJ1KM330F12---T
33		10×9	0.380	520	ERJ1KM330G09---T
47		8×12	0.290	620	ERJ1KM470F12---T
47		8×16	0.200	780	ERJ1KM470F16---T
56		10×13	0.170	780	ERJ1KM560G13---T
68		8×16	0.200	780	ERJ1KM680F16---T
82		10×16	0.110	1,040	ERJ1KM820G16---T
100		10×16	0.140	1,000	ERJ1KM101G16---T
100		10×20	0.084	1,430	ERJ1KM101G20---T
120		10×20	0.084	1,430	ERJ1KM121G20---T
150		10×20	0.120	1,300	ERJ1KM151G20---T
150		12.5×20	0.062	1,750	ERJ1KM151W20---T
220		12.5×25	0.047	2,210	ERJ1KM221W25---T
270		12.5×30	0.042	2,400	ERJ1KM271W30---T
270		16×20	0.048	1,950	ERJ1KM271L20---T
330		12.5×35	0.036	2,600	ERJ1KM331W35---T
390		12.5×40	0.032	2,860	ERJ1KM391W40---T
390		16×25	0.038	2,430	ERJ1KM391L25---T
390		18×20	0.045	2,270	ERJ1KM391M20---T
470		16×30	0.032	2,640	ERJ1KM471L30---T
470		18×25	0.036	2,500	ERJ1KM471M25---T
560		16×35	0.029	2,860	ERJ1KM561L35---T

RJ series

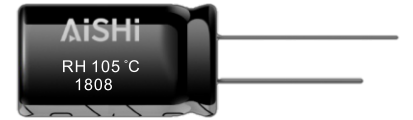
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mA _{rms} /105°C,100kHz)	Part Number
100	560	18×30	0.030	2,860	ERJ1KM561M30---T
	680	16×40	0.027	3,510	ERJ1KM681L40---T
	680	18×35	0.027	3,510	ERJ1KM681M35---T
	820	18×40	0.026	3,860	ERJ1KM821M40---T
120	10	6.3×11	4.600	110	ERJ2BM100E11---T
	15	6.3×12	3.800	145	ERJ2BM150E12---T
	18	8×9	3.500	165	ERJ2BM180F09---T
	22	8×12	3.000	180	ERJ2BM220F12---T
	33	8×16	2.500	320	ERJ2BM330F16---T
	33	10×13	2.500	320	ERJ2BM330G13---T
	47	8×20	2.200	385	ERJ2BM470F20---T
	47	10×16	2.000	400	ERJ2BM470G16---T
	56	10×16	1.900	410	ERJ2BM560G16---T
	68	10×16	1.800	420	ERJ2BM680G16---T
	82	10×20	1.600	435	ERJ2BM820G20---T
	100	10×25	1.300	540	ERJ2BM101G25---T
	120	12.5×20	1.100	750	ERJ2BM121W20---T
	150	12.5×25	0.850	810	ERJ2BM151W25---T
	220	12.5×30	0.650	990	ERJ2BM221W30---T
	220	16×20	0.650	990	ERJ2BM221L20---T
	270	16×25	0.470	1,125	ERJ2BM271L25---T
	270	18×20	0.470	1,125	ERJ2BM271M20---T
	330	16×30	0.360	1,215	ERJ2BM331L30---T
	330	18×25	0.360	1,215	ERJ2BM331M25---T
	470	16×40	0.260	1,350	ERJ2BM471L40---T
	470	18×30	0.260	1,350	ERJ2BM471M30---T

※Specifications subject to change without notice

RH series

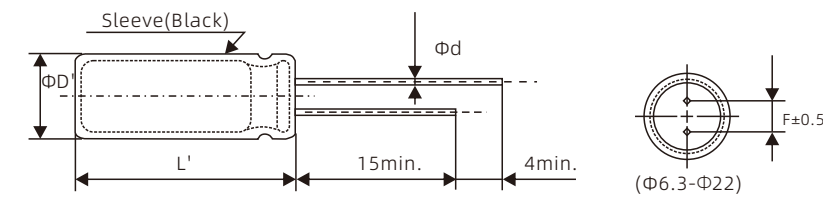
- Endurance:2,000~3,000 hours at 105°C
- High frequency, low impedance
- RoHS Compliant



SPECIFICATIONS

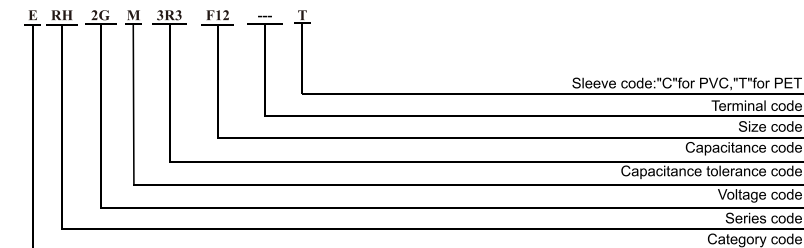
Items	Characteristics											
Category Temperature Range	-40 ~ +105°C(160 to 450Vdc) -25 ~ +105°C(500 to 550Vdc)											
Rated Working Voltage Range	160 ~ 550Vdc											
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)											
Leakage Current	I ≤ 0.02CVor 10μA, Whichever is greater(160 to 450Vdc) I ≒ 0.03CVor 10μA, Whichever is greater(500 to 550Vdc) Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)											
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	160	200	250	350	400	420	450	500	550	(at 20°C,120Hz)	
	Dissipation Factor(Max.)	0.12	0.12	0.12	0.15	0.15	0.2	0.2	0.24	0.24		
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)	160	200	250	350	400	420	450	500	550	(at 120Hz)	
	Z(-25°C)/Z(+20°C)	3	5	5	5	5	6	6	8	15		
	Z(-40°C)/Z(+20°C)	4	7	7	7	7	10	10	—	—		
Endurance	The following specification shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for the specified period of time at 105°C.											
	Capacitance Change	≤±20% of the initial value(550Vdc:≤±30% of the initial value)							Case Dia	Life time (hours)		
	Dissipation Factor	≤200% of the initial specified value(550Vdc:≤300% of the initial specified value)								ØD ≤ 8		2,000
	Leakage Current	≤The initial specified value								ØD ≥10		3,000
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.											
	Capacitance Change	≤±20% of the initial value										
	Dissipation Factor	≤200% of the initial specified value										
	Leakage Current	≤200% of the initial specified value										

DIMENSIONS [mm]



ØD	6.3	8	10	12.5	13	16	18	20	22※
Ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.8
F	2.5	3.5	5.0	5.0	5.0	7.5	7.5	10.0	10.0
ØD'	ØD+0.5max.								
L'	L+2max.								
※	22×55/22×60 Ød=1.0, L'=L+3max.								

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	Freq. (Hz)			
	120	1K	10K	100K
Cap. < 10	0.40	0.70	0.92	1.00
10≤Cap. < 100	0.56	0.83	0.95	1.00
100≤Cap.≤1,000	0.67	0.87	0.96	1.00

RH series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /105°C, 100kHz)	Part Number
160	2.2	6.3×9	70	ERH2CM2R2E09--T
	3.3	6.3×11	103	ERH2CM3R3E11--T
	4.7	8×12	121	ERH2CM4R7F12--T
	10	10×12	150	ERH2CM100G12--T
	22	10×12	213	ERH2CM220G12--T
	33	10×16	283	ERH2CM330G16--T
	47	12.5×16	348	ERH2CM470W16--T
	100	12.5×20	567	ERH2CM101W20--T
200	220	16×25	767	ERH2CM221L25--T
	2.2	6.3×11	77	ERH2DM2R2E11--T
	3.3	6.3×11	103	ERH2DM3R3E11--T
	4.7	8×12	121	ERH2DM4R7F12--T
	10	10×12	152	ERH2DM100G12--T
	22	10×12	196	ERH2DM220G12--T
	22	10×16	228	ERH2DM220G16--T
	33	10×16	304	ERH2DM330G16--T
	33	12.5×14	345	ERH2DM330W14--T
	47	12.5×16	395	ERH2DM470W16--T
	56	12.5×20	456	ERH2DM560W20--T
	68	10×25	464	ERH2DM680G25--T
	82	10×30	574	ERH2DM820G30--T
	100	16×20	600	ERH2DM101L20--T
	120	16×25	801	ERH2DM121L25--T
	150	18×25	908	ERH2DM151M25--T
	180	12.5×35	948	ERH2DM181W35--T
	220	18×30	1,032	ERH2DM221M30--T
250	1	6.3×9	54	ERH2EM010E09--T
	2.2	6.3×11	77	ERH2EM2R2E11--T
	3.3	8×12	106	ERH2EM3R3F12--T
	4.7	8×12	124	ERH2EM4R7F12--T
	10	10×12	152	ERH2EM100G12--T
	22	10×16	205	ERH2EM220G16--T
	33	12.5×16	280	ERH2EM330W160--T
	47	12.5×20	355	ERH2EM470W20--T
	56	12.5×20	452	ERH2EM560W20--T
	82	16×20	620	ERH2EM820L20--T
	100	16×25	780	ERH2EM101L25--T
	220	18×30	1,050	ERH2EM221M30--T
	330	18×40	1,150	ERH2EM331M40--T
	470	22×46	1,290	ERH2EM471O46--T
350	1	6.3×9	54	ERH2VM010E09--T
	2.2	8×12	80	ERH2VM2R2F12--T
	3.3	8×12	109	ERH2VM3R3F12--T
	3.3	10×12	118	ERH2VM3R3G12--T
	4.7	10×12	143	ERH2VM4R7G12--T
	10	10×16	179	ERH2VM100G16--T
	22	12.5×20	301	ERH2VM220W20--T
	47	16×25	480	ERH2VM470L25--T
400	1	6.3×11	41	ERH2GM010E11--T
	2.2	6.3×11	63	ERH2GM2R2E11--T
	3.3	6.3×12	93	ERH2GM3R3E12--T
	3.3	8×12	100	ERH2GM3R3F12--T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /105°C, 100kHz)	Part Number
400	4.7	8×12	117	ERH2GM4R7F12--T
	10	10×14	166	ERH2GM100G14--T
	10	10×16	177	ERH2GM100G16--T
	22	10×18	233	ERH2GM220G18--T
	27	10×18	280	ERH2GM270G18--T
	33	13×20	390	ERH2GM330K20--T
	33	16×20	487	ERH2GM330L20--T
	39	10×30	422	ERH2GM390G30--T
	47	16×20	652	ERH2GM470L20--T
	56	12.5×30	700	ERH2GM560W30--T
	56	16×20	620	ERH2GM560L20--T
	68	16×25	800	ERH2GM680L25--T
	68	18×25	870	ERH2GM680M25--T
	82	12.5×40	880	ERH2GM820W40--T
	82	18×25	880	ERH2GM820M25--T
	100	12.5×50	900	ERH2GM101W50--T
	100	18×30	900	ERH2GM101M30--T
	120	18×30	950	ERH2GM121M30--T
	150	18×35	1,024	ERH2GM151M35--T
	150	22×31	1,050	ERH2GM151O31--T
	180	18×40	1,119	ERH2GM181M40--T
	180	22×31	1,125	ERH2GM181O31--T
	220	18×50	1,288	ERH2GM221M50--T
	220	22×35	1,282	ERH2GM221O35--T
	250	20×45	1,376	ERH2GM251N45--T
	250	22×40	1,376	ERH2GM251O40--T
	270	20×50	1,458	ERH2GM271N50--T
	270	22×46	1,452	ERH2GM271O46--T
	300	20×55	1,540	ERH2GM301N55--T
	300	22×50	1,533	ERH2GM301O50--T
	330	22×55	1,601	ERH2GM331O55--THO
	350	20×60	1,655	ERH2GM351N60--T
	390	22×60	1,703	ERH2GM391O60--THO
420	120	18×30	960	ERH2TM121M30--T
	150	18×35	1,024	ERH2TM151M35--T
	150	20×30	1,037	ERH2TM151N30--T
	180	18×40	1,119	ERH2TM181M40--T
	180	20×35	1,133	ERH2TM181N35--T
	180	22×30	1,125	ERH2TM181O30--T
	220	18×45	1,288	ERH2TM221M45--T
	220	20×40	1,295	ERH2TM221N40--T
	220	22×35	1,282	ERH2TM221O35--T
	250	20×45	1,328	ERH2TM251N45--T
	250	22×40	1,328	ERH2TM251O40--T
	270	18×50	1,388	ERH2TM271M50--T
	270	20×50	1,407	ERH2TM271N50--T
	270	22×46	1,401	ERH2TM271O46--T
	300	18×55	1,547	ERH2TM301M55--T
	300	20×55	1,569	ERH2TM301N55--T
440	300	22×50	1,561	ERH2TM301O50--T
	330	18×60	1,631	ERH2TM331M60--T
	330	22×55	1,631	ERH2TM331O55--THO

RH series

STANDARD RATINGS

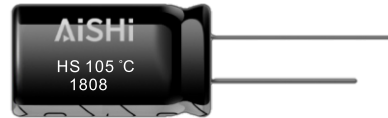
WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /105°C, 100kHz)	Part Number
420	350	20×60	1,685	ERH2TM351N60--THO
	390	22×60	1,734	ERH2TM391O60--T
450	1	8×9	54	ERH2WM010F09--T
	2.2	8×12	72	ERH2WM2R2F12--T
	3.3	8×12	83	ERH2WM3R3F12--T
	4.7	8×12	85	ERH2WM4R7F12--T
	8.2	10×12	92	ERH2WM8R2G12--T
	10	10×14	98	ERH2WM100G14--T
	10	10×16	101	ERH2WM100G16--T
	18	10×18	145	ERH2WM180G18--T
	22	13×16	221	ERH2WM220K16--T
	22	16×20	338	ERH2WM220L20--T
	33	10×35	430	ERH2WM330G35--T
	33	18×20	420	ERH2WM330M20--T
	39	10×40	500	ERH2WM390G40--T
	47	10×45	600	ERH2WM470G45--T
	47	12.5×30	600	ERH2WM470W30--T
	47	16×25	592	ERH2WM470L25--T
	56	12.5×35	670	ERH2WM560W35--T
	56	18×20	656	ERH2WM560M20--T
	68	12.5×40	740	ERH2WM680W40--T
	68	18×25	704	ERH2WM680M25--T
	82	12.5×45	850	ERH2WM820W45--T
	82	18×30	853	ERH2WM820M30--T
	100	18×30	900	ERH2WM101M30--T
	120	18×35	960	ERH2WM121M35--T
500	120	20×30	960	ERH2WM121N30--T
	150	18×40	1,045	ERH2WM151M40--T
	150	20×35	987	ERH2WM151N35--T
	150	22×30	958	ERH2WM151O30--T
	200	18×45	1,164	ERH2WM201M45--T
	200	20×40	1,179	ERH2WM201N40--T
	200	22×35	1,041	ERH2WM201O35--T
	220	20×45	1,288	ERH2WM221N45--T
	220	22×40	1,273	ERH2WM221O40--T
	250	18×50	1,273	ERH2WM251M50--T
	250	20×50	1,350	ERH2WM251N50--T
	250	22×46	1,350	ERH2WM251O46--T
	270	18×55	1,374	ERH2WM271M55--T
	270	20×55	1,491	ERH2WM271N55--T
	270	22×50	1,550	ERH2WM271O50--T
	300	18×60	1,600	ERH2WM301M60--T
	300	22×55	1,650	ERH2WM301O55--THO
	330	20×60	1,700	ERH2WM331N60--T
	350	22×60	1,758	ERH2WM351O60--THO
	68	18×30	785	ERH2HM680M30--T
	82	18×35	843	ERH2HM820M35--T
	82	20×30	843	ERH2HM820N30--T
	100	18×40	925	ERH2HM101M40--T
	100	20×35	932	ERH2HM101N35--T
	100	22×30	932	ERH2HM101O30--T
	120	18×45	970	ERH2HM121M45--T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /105°C, 100kHz)	Part Number
500	120	18×50	1,000	ERH2HM121M50--T
	120	20×40	970	ERH2HM121N40--T
	120	20×45	970	ERH2HM121N45--T
	120	22×35	992	ERH2HM121O35--T
	150	18×55	1,119	ERH2HM151M55--T
	150	18×60	1,119	ERH2HM151M60--T
	150	20×50	1,119	ERH2HM151N50--T
	150	22×40	1,119	ERH2HM151O40--T
	180	20×55	1,268	ERH2HM181N55--T
	180	20×60	1,268	ERH2HM181N60--T
	180	22×46	1,268	ERH2HM181O46--T
	200	22×50	1,417	ERH2HM201O50--T
550	220	22×55	1,492	ERH2HM221O55--THO
	250	22×60	1,641	ERH2HM251O60--THO
	47	18×30	589	ERH2JM470M30--T
	56	18×35	650	ERH2JM560M35--T
	56	20×30	650	ERH2JM560N30--T
	68	18×40	720	ERH2JM680M40--T
	68	20×35	720	ERH2JM680N35--T
	82	18×45	780	ERH2JM820M45--T
	82	20×40	780	ERH2JM820N40--T
	82	22×30	780	ERH2JM820O30--T
	100	18×50	832	ERH2JM101M50--T
	100	20×45	832	ERH2JM101N45--T
550	100	22×35	835	ERH2JM101O35--T
	120	18×55	873	ERH2JM121M55--T
	120	20×50	873	ERH2JM121N50--T
	120	20×55	895	ERH2JM121N55--T
	120	22×40	873	ERH2JM121O40--T
	120	22×46	895	ERH2JM121O46--T
	150	18×60	1,007	ERH2JM151M60--T
	150	20×60	1,007	ERH2JM151N60--T
	150	22×50	1,007	ERH2JM151O50--T
	180	22×55	1,141	ERH2JM181O55--THO
	180	22×60	1,164	ERH2JM181O60--THO

※Specifications subject to change without notice

HS series

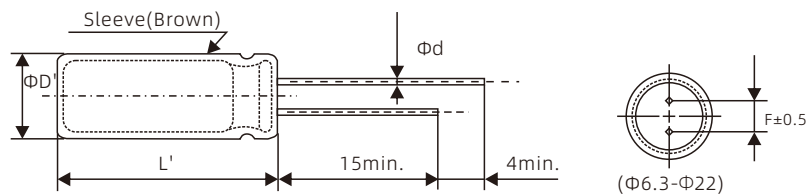
- Endurance:3,000~5,000 hours at 105°C
- High ripple current,for power supply
- RoHS Compliant



SPECIFICATIONS

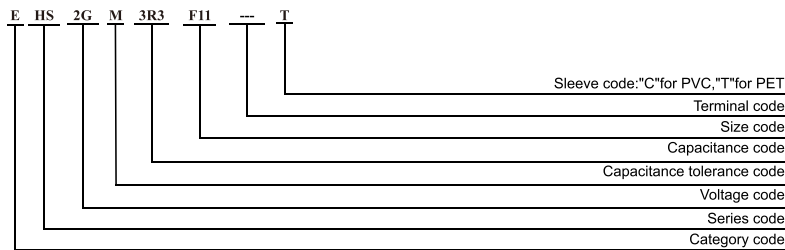
Items	Characteristics												
Category Temperature Range	-40 ~ +105°C (160 ~450Vdc)						-25 ~ +105°C(500 ~550Vdc)						
Rated Working Voltage Range	160 ~550Vdc												
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)												
Leakage Current		After 1 minute		After 5 minutes									
	CV ≤ 1,000	I ≤ 0.1CV+40μA		I ≤ 0.03CV+15μA									
	CV >1,000	I ≤ 0.04CV+100μA		I ≤ 0.02CV+25μA									
	Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C)												
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	160	200	250	350	400	420	450	475	500	525	550	(at 20°C,120Hz)
	Dissipation Factor(Max.)	0.15	0.15	0.15	0.20	0.20	0.20	0.20	0.24	0.24	0.24	0.24	
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage(Vdc)	160	200	250	350	400	420	450	475	500	525	550	(at 120Hz)
	Z(-25°C)/Z(+20°C)	3	3	3	6	6	6	6	8	8	8	8	
	Z(-40°C)/Z(+20°C)	8	8	8	10	10	12	15	/	/	/	/	
Endurance	The following specification shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for the specified period of time at 105°C.												
	Capacitance Change	≤±20% of the initial value (525 ~550Vdc:±30% of the initial value)										Case Dia	Load life(hours)
	Dissipation Factor	≤200% of the initial specified value (525 ~550Vdc:≤300% of the initial specified value)										ØD ≤ 8	3,000
	Leakage Current	≤The initial specified value										ØD ≥ 10	5,000
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.												
	Capacitance Change	≤±20% of the initial value											
	Dissipation Factor	≤200% of the initial specified value											
	Leakage Current	≤200% of the initial specified value											

DIMENSIONS [mm]



ØD	6.3	8	10	12.5	13	16	18	20	22※
Ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.8
F	2.5	3.5	5.0	5.0	5.0	7.5	7.5	10.0	10.0
ØD'	ØD+0.5max.								
L'	L+2max.								
※	22×55/22×60 Ød=1.0, L'=L+3max.								

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	Freq. (Hz)			
	120	1K	10K	100K
Cap. < 100	1.00	1.75	2.25	2.50
Cap. ≥ 100	1.00	1.67	2.05	2.25

HS series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	Part Number
160	1	6.3x9	15	EHS2CM010E09--T
	2.2	6.3x9	22	EHS2CM2R2E09--T
	3.3	6.3x9	30	EHS2CM3R3E09--T
	4.7	6.3x9	37	EHS2CM4R7E09--T
	6.8	8x9	62	EHS2CM6R8F09--T
	8.2	8x9	70	EHS2CM8R2F09--T
	10	8x9	72	EHS2CM100F09--T
	15	8x11	100	EHS2CM150F11--T
	18	8x12	125	EHS2CM180F12--T
	22	8x12	140	EHS2CM220F12--T
	22	10x10	145	EHS2CM220G10--T
	33	10x12	180	EHS2CM330G12--T
	47	10x14	210	EHS2CM470G14--T
	68	10x18	320	EHS2CM680G18--T
	68	12.5x16	370	EHS2CM680W16--T
	82	12.5x16	385	EHS2CM820W16--T
	82	12.5x18	395	EHS2CM820W18--T
	100	12.5x20	430	EHS2CM101W20--T
	100	16x16	445	EHS2CM101L16--T
	150	12.5x25	465	EHS2CM151W25--T
200	150	16x20	500	EHS2CM151L20--T
	220	16x25	815	EHS2CM221L25--T
	270	16x30	880	EHS2CM271L30--T
	270	18x25	890	EHS2CM271M25--T
	1	6.3x9	15	EHS2DM010E09--T
	2.2	6.3x9	20	EHS2DM2R2E09--T
	3.3	6.3x9	28	EHS2DM3R3E09--T
	4.7	6.3x9	35	EHS2DM4R7E09--T
	6.8	8x9	60	EHS2DM6R8F09--T
	8.2	8x9	65	EHS2DM8R2F09--T
	10	8x9	70	EHS2DM100F09--T
	15	8x11	80	EHS2DM150F11--T
	18	8x14	95	EHS2DM180F14--T
	22	8x16	140	EHS2DM220F16--T
	22	10x12	155	EHS2DM220G12--T
	33	10x14	160	EHS2DM330G14--T
	47	10x16	215	EHS2DM470G16--T
	68	12.5x18	310	EHS2DM680W18--T
	82	12.5x20	355	EHS2DM820W20--T
250	100	12.5x22	395	EHS2DM101W22--T
	100	16x16	450	EHS2DM101L16--T
	150	12.5x35	600	EHS2DM151W35--T
	150	16x25	620	EHS2DM151L25--T
	220	18x25	680	EHS2DM221M25--T
	270	18x30	750	EHS2DM271M30--T
	1	6.3x9	15	EHS2EM010E09--T
	2.2	6.3x9	20	EHS2EM2R2E09--T
	3.3	6.3x9	25	EHS2EM3R3E09--T
	4.7	6.3x12	55	EHS2EM4R7E12--T
	6.8	8x9	65	EHS2EM6R8F09--T
	8.2	8x9	75	EHS2EM8R2F09--T
	10	8x12	95	EHS2EM100F12--T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	Part Number
250	15	8x14	105	EHS2EM150F14--T
	18	10x12	150	EHS2EM180G12--T
	22	10x14	168	EHS2EM220G14--T
	33	10x16	210	EHS2EM330G16--T
	47	12.5x18	320	EHS2EM470W18--T
	56	12.5x20	350	EHS2EM560W20--T
	82	12.5x25	450	EHS2EM820W25--T
	82	16x18	475	EHS2EM820L18--T
	100	12.5x30	510	EHS2EM101W30--T
	100	16x25	530	EHS2EM101L25--T
	150	18x25	550	EHS2EM151M25--T
	150	16x30	570	EHS2EM151L30--T
350	220	18x30	710	EHS2EM221M30--T
	270	18x35	780	EHS2EM271M35--T
	1	6.3x9	20	EHS2VM010E09--T
	2.2	6.3x11	30	EHS2VM2R2E11--T
	3.3	6.3x12	40	EHS2VM3R3E12--T
	4.7	8x9	47	EHS2VM4R7F09--T
	6.8	8x11	65	EHS2VM6R8F11--T
	8.2	8x12	78	EHS2VM8R2F12--T
	10	8x14	83	EHS2VM100F14--T
	15	10x12	125	EHS2VM150G12--T
	18	10x14	160	EHS2VM180G14--T
	22	10x16	175	EHS2VM220G16--T
400	33	12.5x18	240	EHS2VM330W18--T
	47	12.5x22	275	EHS2VM470W22--T
	68	12.5x35	395	EHS2VM680W35--T
	82	16x25	475	EHS2VM820L25--T
	100	16x30	520	EHS2VM101L30--T
	100	18x25	530	EHS2VM101M25--T
	150	18x30	570	EHS2VM151M30--T
	220	18x40	720	EHS2VM221M40--T
	1	6.3x9	20	EHS2GM010E09--T
	2.2	6.3x11	30	EHS2GM2R2E11--T
	3.3	6.3x12	40	EHS2GM3R3E12--T
	4.7	8x9	47	EHS2GM4R7F09--T
400	6.8	8x11	65	EHS2GM6R8F11--T
	8.2	8x12	78	EHS2GM8R2F12--T
	10	8x16	95	EHS2GM100F16--T
	10	10x10	100	EHS2GM100G10--T
	15	10x12	130	EHS2GM150G12--T
	15	10x14	140	EHS2GM150G14--T
	18	10x16	165	EHS2GM180G16--T
	22	10x16	180	EHS2GM220G16--T
	22	12.5x16	210	EHS2GM220W16--T
	33	12.5x18	260	EHS2GM330W18--T
	33	12.5x20	275	EHS2GM330W20--T
	47	12.5x25	350	EHS2GM470W25--T
400	47	16x18	365	EHS2GM470L18--T
	56	12.5x30	385	EHS2GM560W30--T
	68	16x25	420	EHS2GM680L25--T
	82	16x30	475	EHS2GM820L30--T

HS series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
400	82	18x25	500	EHS2GM820M25--T
	100	18x25	540	EHS2GM101M25--T
	100	18x30	560	EHS2GM101M30--T
	150	18x40	750	EHS2GM151M40--T
	180	18x40	850	EHS2GM181M40--T
	200	18x45	886	EHS2GM201M45--T
	200	20x40	886	EHS2GM201N40--T
	220	18x50	932	EHS2GM221M50--T
	220	20x45	932	EHS2GM221N45--T
	250	22x40	1,025	EHS2GM251O40--T
	270	20x50	1,119	EHS2GM271N50--T
	300	18x60	1,212	EHS2GM301M60--T
	300	20x55	1,212	EHS2GM301N55--T
	300	22x46	1,165	EHS2GM301O46--T
	330	20x60	1,280	EHS2GM331N60--T
	330	22x50	1,280	EHS2GM331O50--T
420	350	22x55	1,300	EHS2GM351O55--THO
	420	22x60	1,400	EHS2GM421O60--THO
	1	6.3x9	20	EHS2TM010E09--T
	2.2	6.3x11	30	EHS2TM2R2E11--T
	3.3	6.3x12	40	EHS2TM3R3E12--T
	4.7	8x9	47	EHS2TM4R7F09--T
	6.8	8x11	65	EHS2TM6R8F11--T
	8.2	8x12	80	EHS2TM8R2F12--T
	8.2	10x10	82	EHS2TM8R2G10--T
	10	8x16	95	EHS2TM100F16--T
	10	10x12	100	EHS2TM100G12--T
	15	10x14	140	EHS2TM150G14--T
	15	10x16	145	EHS2TM150G16--T
	18	10x16	165	EHS2TM180G16--T
	22	10x18	180	EHS2TM220G18--T
	22	12.5x16	210	EHS2TM220W16--T
450	33	12.5x20	260	EHS2TM330W20--T
	33	13x18	260	EHS2TM330K18--T
	47	12.5x25	355	EHS2TM470W25--T
	47	16x20	370	EHS2TM470L20--T
	56	16x25	420	EHS2TM560L25--T
	82	16x30	540	EHS2TM820L30--T
	82	18x25	550	EHS2TM820M25--T
	100	18x30	580	EHS2TM101M30--T
	150	18x40	750	EHS2TM151M40--T
	1	6.3x9	20	EHS2WM010E09--T
	2.2	6.3x11	30	EHS2WM2R2E11--T
	3.3	8x9	40	EHS2WM3R3F09--T
	3.3	8x11	45	EHS2WM3R3F11--T
	4.7	8x11	50	EHS2WM4R7F11--T
	6.8	8x12	68	EHS2WM6R8F12--T
	8.2	10x10	85	EHS2WM8R2G10--T
	10	8x16	100	EHS2WM100F16--T
450	10	10x12	105	EHS2WM100G12--T
	15	10x16	150	EHS2WM150G16--T
	18	10x18	170	EHS2WM180G18--T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
450	22	12.5x16	185	EHS2WM220W16--T
	33	12.5x22	235	EHS2WM330W22--T
	33	16x18	290	EHS2WM330L18--T
	47	16x20	370	EHS2WM470L20--T
	47	16x25	390	EHS2WM470L25--T
	56	18x20	430	EHS2WM560M20--T
	82	16x35	550	EHS2WM820L35--T
	82	18x30	560	EHS2WM820M30--T
	100	18x31	600	EHS2WM101M31--T
	150	18x40	800	EHS2WM151M40--T
	180	18x45	864	EHS2WM181M45--T
	180	20x40	864	EHS2WM181N40--T
	200	18x50	905	EHS2WM201M50--T
	200	20x45	905	EHS2WM201N45--T
	200	22x40	905	EHS2WM201O40--T
	220	18x55	1,000	EHS2WM221M55--T
475	220	20x50	1,000	EHS2WM221N50--T
	250	18x60	1,027	EHS2WM251M60--T
	250	20x55	1,027	EHS2WM251N55--T
	250	22x46	1,027	EHS2WM251O46--T
	270	20x60	1,110	EHS2WM271N60--T
	270	22x50	1,110	EHS2WM271O50--T
	330	22x55	1,280	EHS2WM331O55--THO
	350	22x60	1,320	EHS2WM351O60--THO
	150	18x50	800	EHS3DM151M50--T
	150	20x40	820	EHS3DM151N40--T
	180	18x55	883	EHS3DM181M55--T
	200	18x60	902	EHS3DM201M60--T
	200	20x50	912	EHS3DM201N50--T
	200	22x46	923	EHS3DM201O46--T
	220	20x55	1,000	EHS3DM221N55--T
	250	20x60	1,050	EHS3DM251N60--T
500	250	22x55	1,050	EHS3DM251O55--THO
	270	22x60	1,110	EHS3DM271O60--THO
	4.7	8x14	30	EHS2HM4R7F14--T
	5.6	10x12	50	EHS2HM5R6G12--T
	6.8	10x14	60	EHS2HM6R8G14--T
	8.2	10x14	65	EHS2HM8R2G14--T
	10	10x16	70	EHS2HM100G16--T
	10	12.5x16	100	EHS2HM100W16--T
	15	12.5x16	130	EHS2HM150W16--T
	15	12.5x18	135	EHS2HM150W18--T
	22	13x20	170	EHS2HM220K20--T
	22	12.5x22	185	EHS2HM220W22--T
	33	16x20	280	EHS2HM330L20--T
	33	16x25	290	EHS2HM330L25--T
	47	18x25	370	EHS2HM470M25--T
	47	16x30	390	EHS2HM470L30--T
500	56	18x25	440	EHS2HM560M25--T
	68	18x30	480	EHS2HM680M30--T
	68	16x35	500	EHS2HM680L35--T
	82	18x35	560	EHS2HM820M35--T

HS series

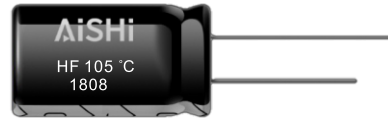
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
500	100	18x40	620	EHS2HM101M40--T
	120	18x45	650	EHS2HM121M45--T
	120	18x50	670	EHS2HM121M50--T
	120	20x40	670	EHS2HM121N40--T
	120	20x45	690	EHS2HM121N45--T
	150	18x55	710	EHS2HM151M55--T
	150	18x60	720	EHS2HM151M60--T
	150	20x50	720	EHS2HM151N50--T
	150	22x40	720	EHS2HM151O40--T
	180	20x55	800	EHS2HM181N55--T
	180	20x60	820	EHS2HM181N60--T
	180	22x46	820	EHS2HM181O46--T
	200	22x50	872	EHS2HM201O50--T
	220	22x55	904	EHS2HM221O55--THO
	250	22x60	973	EHS2HM251O60--THO
525	82	18x40	530	EHS2YM820M40--T
	100	18x45	590	EHS2YM101M45--T
	100	20x40	590	EHS2YM101N40--T
	120	18x50	640	EHS2YM121M50--T
	120	18x55	660	EHS2YM121M55--T
	120	20x45	640	EHS2YM121N45--T
	120	20x50	660	EHS2YM121N50--T
	120	22x40	660	EHS2YM121O40--T
	150	18x60	700	EHS2YM151M60--T
	150	20x55	700	EHS2YM151N55--T
	150	22x46	700	EHS2YM151O46--T
	180	20x60	790	EHS2YM181N60--T
	180	22x50	790	EHS2YM181O50--T
	200	22x55	855	EHS2YM201O55--THO
	220	22x60	900	EHS2YM221O60--THO
550	10	12.5x16	85	EHS2JM100W16--T
	12	12.5x16	90	EHS2JM120W16--T
	15	12.5x18	100	EHS2JM150W18--T
	22	16x20	190	EHS2JM220L20--T
	33	16x25	280	EHS2JM330L25--T
	33	18x20	295	EHS2JM330M20--T
	47	18x30	400	EHS2JM470M30--T
	56	18x35	440	EHS2JM560M35--T
	68	18x40	470	EHS2JM680M40--T
	82	18x45	510	EHS2JM820M45--T
	82	20x40	510	EHS2JM820N40--T
	100	18x50	650	EHS2JM101M50--T
	100	20x45	650	EHS2JM101N45--T
	120	18x55	710	EHS2JM121M55--T
	120	20x50	720	EHS2JM121N50--T
	120	20x55	730	EHS2JM121N55--T
550	120	22x46	720	EHS2JM121O46--T
	150	20x60	760	EHS2JM151N60--T
	150	22x50	800	EHS2JM151O50--T
	180	22x55	840	EHS2JM181O55--THO
	180	22x60	860	EHS2JM181O60--THO

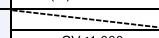
※Specifications subject to change without notice

HF series

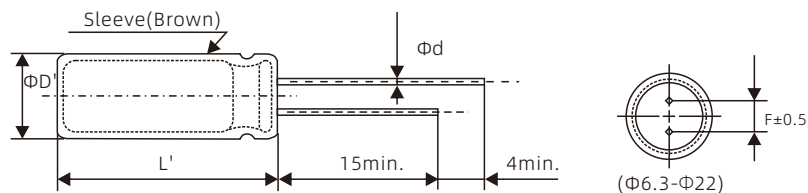
- Endurance: 5,000~10,000 hours at 105°C
- Long Life, high ripple current, for power supply
- RoHS Compliant



SPECIFICATIONS

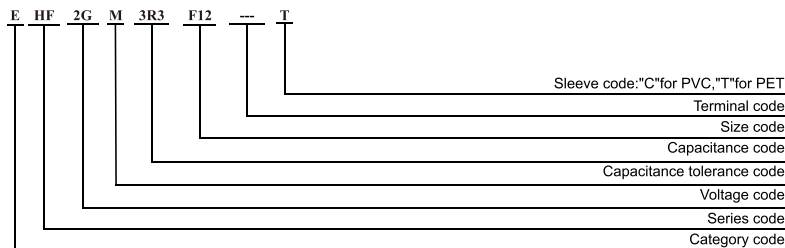
Items	Characteristics											
Category Temperature Range	-40 ~ +105°C (160 to 450Vdc) -25 ~ +105°C(475 to 550Vdc)											
Rated Working Voltage Range	160 ~ 550Vdc											
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)											
Leakage Current		After 1 minute		After 5 minutes								
	CV≤1,000	≤0.1CV+40μA		≤0.03CV+15μA								
	CV > 1,000	≤0.04CV+100μA		≤0.02CV+25μA								
	Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C)											
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	160	200	250	350	400	450	475	500	525	550	(at 20°C,120Hz)
	Dissipation Factor(Max.)	0.15	0.15	0.15	0.2	0.2	0.2	0.24	0.24	0.24	0.24	
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)	160	200	250	350	400	450	475	500	525	550	(at 120Hz)
	Z(-25°C)/Z(+20°C)	3	3	3	6	6	6	6	6	15	15	
	Z(-40°C)/Z(+20°C)	8	8	8	10	10	10	—	—	—	—	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for the specified period of time at 105°C.											
	Capacitance Change	≤±20% of the initial value(525 ~550Vdc:≤±30% of the initial value)								Case Dia	160 to 475Vdc	500 to 550Vdc
	Dissipation Factor	≤200% of the initial specified value (525 ~550Vdc:≤300% of the initial specified value)								ØD ≤ 8	5,000	5,000
										ØD= 10	8,000	8,000
	Leakage Current	≤The initial specified value								ØD ≥ 12.5	10,000	8,000
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.											
	Capacitance Change	≤±20% of the initial value										
	Dissipation Factor	≤200% of the initial specified value										
	Leakage Current	≤200% of the initial specified value										

DIMENSIONS [mm]



ØD	6.3	8	10	12.5	13	16	18	20	22※
Ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.8
F	2.5	3.5	5.0	5.0	5.0	7.5	7.5	10.0	10.0
ØD'	ØD+0.5max.								
L'	L+2max.								
※	22×55/22×60 Ød=1.0, L'=L+3max.								

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF) \ Freq. (Hz)	120	1K	10K	100K
Cap. < 100	1.00	1.75	2.25	2.50
Cap. ≥ 100	1.00	1.67	2.05	2.25

HF series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
160	10	8x12	78	EHF2CM100F12---T
	12	8x12	88	EHF2CM120F12---T
	15	8x14	97	EHF2CM150F14---T
	22	10x12	139	EHF2CM220G12---T
	33	10x16	210	EHF2CM330G16---T
	39	10x16	220	EHF2CM390G16---T
	47	8x20	230	EHF2CM470F20---T
	47	10x16	230	EHF2CM470G16---T
	56	10x20	267	EHF2CM560G20---T
	68	12.5x20	470	EHF2CM680W20---T
	82	10x25	480	EHF2CM820G25---T
	82	12.5x20	510	EHF2CM820W20---T
	100	12.5x25	630	EHF2CM101W25---T
	100	16x20	635	EHF2CM101L20---T
	150	16x20	770	EHF2CM151L20---T
	150	16x25	790	EHF2CM151L25---T
200	10	8x12	77	EHF2DM100F12---T
	12	10x12	113	EHF2DM120G12---T
	15	8x16	115	EHF2DM150F16---T
	22	10x14	152	EHF2DM220G14---T
	33	10x18	225	EHF2DM330G18---T
	33	12.5x16	225	EHF2DM330W16---T
	39	12.5x16	263	EHF2DM390W16---T
	47	12.5x18	362	EHF2DM470W18---T
	68	12.5x20	470	EHF2DM680W20---T
	68	12.5x25	485	EHF2DM680W25---T
	82	16x20	530	EHF2DM820L20---T
	100	12.5x25	551	EHF2DM101W25---T
	100	16x20	556	EHF2DM101L20---T
	150	16x25	840	EHF2DM151L25---T
	150	16x30	865	EHF2DM151L30---T
	150	18x25	870	EHF2DM151M25---T
250	4.7	8x11	49	EHF2EM4R7F11---T
	5.6	8x11	55	EHF2EM5R6F11---T
	6.8	10x10	80	EHF2EM6R8G10---T
	10	10x12	95	EHF2EM100G12---T
	22	10x16	172	EHF2EM220G16---T
	33	10x20	248	EHF2EM330G20---T
	47	10x25	315	EHF2EM470G25---T
	47	12.5x20	328	EHF2EM470W20---T
	56	12.5x20	340	EHF2EM560W20---T
	68	16x20	528	EHF2EM680L20---T
	82	16x20	550	EHF2EM820L20---T
	82	16x25	560	EHF2EM820L25---T
	100	12.5x30	584	EHF2EM101W30---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
250	100	16x25	604	EHF2EM101L25---T
	150	18x25	866	EHF2EM151M25---T
	180	18x25	890	EHF2EM221M25---T
	220	18x30	923	EHF2EM221M30---T
350	4.7	10x10	50	EHF2VM4R7G10---T
	5.6	10x12	90	EHF2VM5R6G12---T
	6.8	10x12	95	EHF2VM6R8G12---T
	10	10x16	110	EHF2VM100G16---T
	22	12.5x16	205	EHF2VM220W16---T
	33	16x20	364	EHF2VM330L20---T
	39	16x20	385	EHF2VM390L20---T
	47	16x20	430	EHF2VM470L20---T
	47	16x25	445	EHF2VM470L25---T
	68	16x25	560	EHF2VM680L25---T
	68	18x20	550	EHF2VM680M20---T
	68	18x25	570	EHF2VM680M25---T
	82	18x25	618	EHF2VM820M25---T
	100	18x25	700	EHF2VM101M25---T
	100	18x30	725	EHF2VM101M30---T
400	120	18x30	836	EHF2VM121M30---T
	150	18x35	970	EHF2VM151M35---T
	1	6.3x9	18	EHF2GM010E09---T
	2.2	6.3x12	34	EHF2GM2R2E12---T
	3.3	8x12	60	EHF2GM3R3F12---T
	4.7	8x12	65	EHF2GM4R7F12---T
	6.8	8x12	70	EHF2GM6R8F12---T
	10	10x16	121	EHF2GM100G16---T
	15	10x16	142	EHF2GM150G16---T
	22	10x18	182	EHF2GM220G18---T
	22	12.5x16	196	EHF2GM220W16---T
	33	16x20	368	EHF2GM330L20---T
	39	12.5x25	370	EHF2GM390W25---T
	47	16x20	400	EHF2GM470L20---T
	47	16x25	460	EHF2GM470L25---T

HF series

STANDARD RATINGS

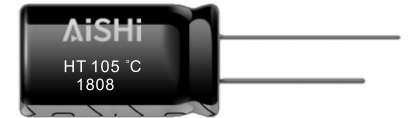
WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	Part Number
400	330	22x55	1,430	EHF2GM331O55---THO
	390	22x60	1,540	EHF2GM391O60---THO
450	6.8	8x12	60	EHF2WM6R8F12---T
	10	10x16	120	EHF2WM100G16---T
	10	12.5x16	125	EHF2WM100W16---T
	15	16x16	245	EHF2WM150L16---T
	22	16x20	295	EHF2WM220L20---T
	27	12.5x25	305	EHF2WM270W25---T
	33	16x20	338	EHF2WM330L20---T
	33	16x25	390	EHF2WM330L25---T
	47	16x25	400	EHF2WM470L25---T
	47	18x20	456	EHF2WM470M20---T
	47	18x25	496	EHF2WM470M25---T
	56	12.5x40	550	EHF2WM560W40---T
	68	18x25	558	EHF2WM680M25---T
	82	12.5x50	682	EHF2WM820W50---T
	82	18x30	638	EHF2WM820M30---T
	100	18x35	750	EHF2WM101M35---T
	120	22x30	826	EHF2WM121O30---T
	150	18x45	900	EHF2WM151M45---T
	180	18x55	950	EHF2WM181M55---T
	200	20x45	995	EHF2WM201N45---T
	220	20x55	1,050	EHF2WM221N55---T
	250	20x60	1,110	EHF2WM251N60---T
	250	22x50	1,110	EHF2WM251O50---T
	300	22x55	1,325	EHF2WM301O55---THO
475	100	18x40	750	EHF3DM101M40---T
	120	18x45	825	EHF3DM121M45---T
	120	20x40	825	EHF3DM121N40---T
	150	18x50	880	EHF3DM151M50---T
	150	18x55	910	EHF3DM151M55---T
	150	20x45	890	EHF3DM151N45---T
	150	20x50	910	EHF3DM151N50---T
	150	22x40	900	EHF3DM151O40---T
	180	18x60	950	EHF3DM181M60---T
	180	20x55	950	EHF3DM181N55---T
	180	22x46	950	EHF3DM181O46---T
	200	20x60	995	EHF3DM201N60---T
	200	22x50	995	EHF3DM201O50---T
	220	22x55	1,050	EHF3DM221O55---THO
	250	22x60	1,100	EHF3DM251O60---THO
500	56	16x40	430	EHF2HM560L40---T
	68	16x45	520	EHF2HM680L45---T
	68	18x30	480	EHF2HM680M30---T
	82	18x35	560	EHF2HM820M35---T
	82	18x40	580	EHF2HM820M40---T
	100	18x40	660	EHF2HM101M40---T
	100	18x45	680	EHF2HM101M45---T
	100	20x40	680	EHF2HM101N40---T
	120	18x50	740	EHF2HM121M50---T
	120	20x45	740	EHF2HM121N45---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	Part Number
500	150	20x50	780	EHF2HM151N50---T
	150	20x55	800	EHF2HM151N55---T
	150	22x46	800	EHF2HM151O46---T
	180	20x60	880	EHF2HM181N60---T
	180	22x50	880	EHF2HM181O50---T
	200	22x55	920	EHF2HM201O55---THO
525	220	22x60	960	EHF2HM221O60---THO
	82	18x40	530	EHF2YM820M40---T
	100	18x45	590	EHF2YM101M45---T
	100	20x40	590	EHF2YM101N40---T
	120	18x55	660	EHF2YM121M55---T
	120	20x45	640	EHF2YM121N45---T
	120	20x50	660	EHF2YM121N50---T
	120	22x40	660	EHF2YM121O40---T
	150	20x55	700	EHF2YM151N55---T
	150	22x46	700	EHF2YM151O46---T
	180	20x60	790	EHF2YM181N60---T
	200	22x55	855	EHF2YM201O55---THO
	220	22x60	900	EHF2YM221O60---THO
550	68	18x40	470	EHF2JM680M40---T
	82	18x45	510	EHF2JM820M45---T
	82	18x50	530	EHF2JM820M50---T
	82	20x40	510	EHF2JM820N40---T
	82	20x45	530	EHF2JM820N45---T
	100	18x55	590	EHF2JM101M55---T
	100	20x50	590	EHF2JM101N50---T
	100	22x40	590	EHF2JM101O40---T
	110	18x60	610	EHF2JM111M60---T
	120	20x55	620	EHF2JM121N55---T
	120	20x60	640	EHF2JM121N60---T
	120	22x46	620	EHF2JM121O46---T
	120	22x50	640	EHF2JM121O50---T
	150	22x55	700	EHF2JM151O55---THO

※ Specifications subject to change without notice

HT series

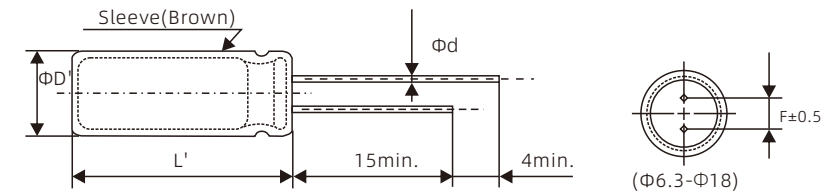
- Endurance: 2,000 hours at 125°C
- High temperature, high ripple current, for power supply
- RoHS Compliant



SPECIFICATIONS

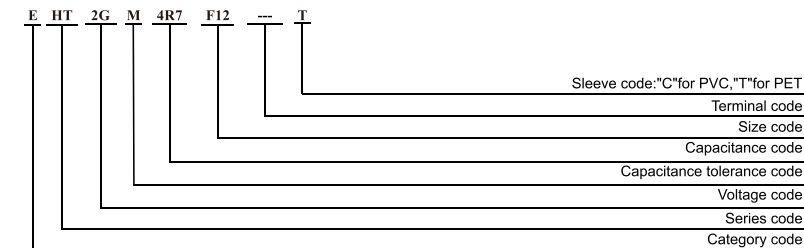
Items	Characteristics									
Category Temperature Range	-40 ~ +125°C(160 ~450Vdc)					-25 ~ +125°C(500Vdc)				
Rated Working Voltage Range	160 ~500Vdc									
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)									
Leakage Current		After 1 minute		After 5 minutes						
	CV ≤1,000	I ≤ 0.1CV+40μA		I ≤ 0.03CV+15μA						
	CV >1,000	I ≤ 0.04CV+100μA		I ≤ 0.02CV+25μA						
	Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C)									
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	160	200	250	350	400	420	450	500	(at 20°C,120Hz)
	Dissipation Factor(Max.)	0.18	0.18	0.18	0.24	0.24	0.24	0.24	0.24	
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)	160	200	250	350	400	420	450	500	(at 120Hz)
	Z(-25°C)/Z(+20°C)	3	3	3	6	6	6	6	8	
	Z(-40°C)/Z(+20°C)	8	8	8	10	10	12	15	/	
Endurance	The following specification shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for 2,000 hours at 125°C.									
	Capacitance Change	≤±30% of the initial value								
	Dissipation Factor	≤300% of the initial specified value								
	Leakage Current	≤The initial specified value								
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.									
	Capacitance Change	≤±20% of the initial value								
	Dissipation Factor	≤200% of the initial specified value								
	Leakage Current	≤200% of the initial specified value								

DIMENSIONS [mm]



ΦD	6.3	8	10	12.5	16	18
Φd	0.5	0.5	0.6	0.6	0.6	0.8
F	2.5	3.5	5.0	5.0	7.5	7.5
ΦD'	ΦD+0.5max.					
L'	L+2max.					

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	Freq. (Hz)	120	1K	10K	100K
Cap. < 100		1.00	1.75	2.25	2.50
Cap. ≥ 100		1.00	1.67	2.05	2.25

HT series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /125°C, 120Hz)	Part Number
160	4.7	8x9	20	EHT2CM4R7F09--T
	5.6	8x11	28	EHT2CM5R6F11--T
	5.6	8x12	32	EHT2CM5R6F12--T
	6.8	8x11	33	EHT2CM6R8F11--T
	6.8	8x12	35	EHT2CM6R8F12--T
	8.2	8x12	45	EHT2CM8R2F12--T
	10	8x12	55	EHT2CM100F12--T
	10	10x10	58	EHT2CM100G10--T
	15	8x14	60	EHT2CM150F14--T
	15	10x12	78	EHT2CM150G12--T
	22	10x12	110	EHT2CM220G12--T
	33	10x16	136	EHT2CM330G16--T
	47	10x18	155	EHT2CM470G18--T
	47	12.5x16	160	EHT2CM470W16--T
	68	12.5x18	190	EHT2CM680W18--T
	82	12.5x20	210	EHT2CM820W20--T
	100	12.5x25	285	EHT2CM101W25--T
	100	16x18	292	EHT2CM101L18--T
	120	16x20	325	EHT2CM121L20--T
	150	16x25	350	EHT2CM151L25--T
	150	18x20	365	EHT2CM151M20--T
200	4.7	8x9	35	EHT2DM4R7F09--T
	4.7	8x11	38	EHT2DM4R7F11--T
	5.6	8x11	40	EHT2DM5R6F11--T
	6.8	8x11	45	EHT2DM6R8F11--T
	6.8	8x12	46	EHT2DM6R8F12--T
	8.2	8x12	58	EHT2DM8R2F12--T
	10	8x14	66	EHT2DM100F14--T
	10	10x12	90	EHT2DM100G12--T
	15	10x12	95	EHT2DM150G12--T
	22	10x14	115	EHT2DM220G14--T
	33	10x18	145	EHT2DM330G18--T
	33	12.5x16	150	EHT2DM330W16--T
	47	12.5x18	165	EHT2DM470W18--T
	56	12.5x20	180	EHT2DM560W20--T
	68	12.5x22	200	EHT2DM680W22--T
	68	16x18	225	EHT2DM680L18--T
	82	16x20	240	EHT2DM820L20--T
	100	16x25	310	EHT2DM101L25--T
	120	18x25	350	EHT2DM121M25--T
	150	16x30	375	EHT2DM151L30--T
250	4.7	8x9	38	EHT2EM4R7F09--T
	4.7	8x11	40	EHT2EM4R7F11--T
	5.6	8x11	45	EHT2EM5R6F11--T
	6.8	8x12	52	EHT2EM6R8F12--T
	8.2	8x14	65	EHT2EM8R2F14--T
	10	8x16	80	EHT2EM100F16--T
	10	10x12	85	EHT2EM100G12--T
	15	10x14	95	EHT2EM150G14--T
	22	10x16	115	EHT2EM220G16--T
	33	12.5x16	145	EHT2EM330W16--T
	33	12.5x18	160	EHT2EM330W18--T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /125°C, 120Hz)	Part Number
250	47	12.5x20	175	EHT2EM470W20--T
	56	12.5x25	190	EHT2EM560W25--T
	56	16x18	205	EHT2EM560L18--T
	68	12.5x30	225	EHT2EM680W30--T
	68	16x20	235	EHT2EM680L20--T
	82	12.5x35	260	EHT2EM820W35--T
	82	16x25	275	EHT2EM820L25--T
	100	16x30	325	EHT2EM101L30--T
	100	18x25	350	EHT2EM101M25--T
	120	16x30	375	EHT2EM121L30--T
	120	18x25	385	EHT2EM121M25--T
	150	18x30	400	EHT2EM151M30--T
350	4.7	8x11	40	EHT2VM4R7F11---T
	4.7	8x12	42	EHT2VM4R7F12---T
	5.6	8x12	45	EHT2VM5R6F12---T
	5.6	8x14	50	EHT2VM5R6F14---T
	6.8	8x14	52	EHT2VM6R8F14---T
	6.8	8x16	55	EHT2VM6R8F16---T
	8.2	8x16	65	EHT2VM8R2F16---T
	10	10x12	80	EHT2VM100G12---T
	10	10x14	85	EHT2VM100G14---T
	15	10x16	95	EHT2VM150G16---T
	22	10x18	125	EHT2VM220G18---T
	33	12.5x20	145	EHT2VM330W20---T
	33	12.5x22	160	EHT2VM330W22---T
	47	12.5x25	175	EHT2VM470W25---T
	47	16x20	185	EHT2VM470L20---T
	56	16x25	205	EHT2VM560L25---T
	68	16x25	225	EHT2VM680L25---T
	68	18x20	235	EHT2VM680M20---T
	82	18x25	275	EHT2VM820M25---T
	100	16x30	325	EHT2VM101L30---T
	100	18x25	350	EHT2VM101M25---T
400	120	16x35	375	EHT2VM121L35---T
	120	18x30	385	EHT2VM121M30---T
	150	18x35	400	EHT2VM151M35---T
	4.7	8x12	40	EHT2GM4R7F12--T
	5.6	8x14	45	EHT2GM5R6F14--T
	5.6	8x16	50	EHT2GM5R6F16--T
	6.8	8x16	52	EHT2GM6R8F16--T
	6.8	10x12	55	EHT2GM6R8G12--T
	8.2	10x12	65	EHT2GM8R2G12--T
	10	10x14	80	EHT2GM100G14--T
	10	10x16	85	EHT2GM100G16--T
	15	10x18	100	EHT2GM150G18--T
	22	10x18	125	EHT2GM220G18--T
	22	12.5x18	130	EHT2GM220W18--T
	33	12.5x20	150	EHT2GM330W20--T
	33	12.5x22	165	EHT2GM330W22--T
	47	16x20	200	EHT2GM470L20--T
	47	16x25	210	EHT2GM470L25--T
	56	16x25	235	EHT2GM560L25--T

HT series

STANDARD RATINGS

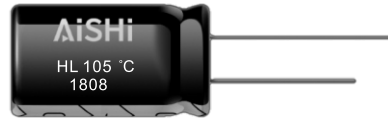
WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /125°C, 120Hz)	Part Number
400	56	18x20	240	EHT2GM560M20--T
	68	16x30	265	EHT2GM680L30--T
	68	18x25	280	EHT2GM680M25--T
	82	18x25	325	EHT2GM820M25--T
	100	18x30	395	EHT2GM101M30--T
	120	18x35	420	EHT2GM121M35--T
	150	18x40	465	EHT2GM151M40--T
420	4.7	8x12	40	EHT2TM4R7F12--T
	5.6	8x16	45	EHT2TM5R6F16--T
	5.6	10x12	50	EHT2TM5R6G12--T
	6.8	10x12	55	EHT2TM6R8G12--T
	8.2	10x14	65	EHT2TM8R2G14--T
	10	10x14	85	EHT2TM100G14--T
	10	10x16	90	EHT2TM100G16--T
	15	10x18	105	EHT2TM150G18--T
	22	12.5x18	135	EHT2TM220W18--T
	22	12.5x20	140	EHT2TM220W20--T
	33	12.5x22	165	EHT2TM330W22--T
	33	12.5x25	175	EHT2TM330W25--T
	47	16x25	205	EHT2TM470L25--T
	47	18x20	215	EHT2TM470M20--T
	56	18x25	240	EHT2TM560M25--T
	68	16x30	275	EHT2TM680L30--T
	82	16x35	345	EHT2TM820L35--T
	82	18x30	355	EHT2TM820M30--T
	100	16x40	405	EHT2TM101L40--T
	100	18x35	415	EHT2TM101M35--T
450	120	16x45	420	EHT2TM121L45--T
	120	18x40	430	EHT2TM121M40--T
	150	18x45	465	EHT2TM151M45--T
	4.7	8x16	40	EHT2WM4R7F16---T
	5.6	10x12	45	EHT2WM5R6G12---T
	5.6	10x14	50	EHT2WM5R6G14---T
	6.8	10x14	55	EHT2WM6R8G14---T
	8.2	10x16	70	EHT2WM8R2G16---T
	10	10x18	85	EHT2WM100G18---T
	10	12.5x16	90	EHT2WM100W16---T
	15	12.5x16	110	EHT2WM150W16---T
	15	12.5x18	115	EHT2WM150W18---T
	22	13x20	135	EHT2WM220K20---T
	22	12.5x22	140	EHT2WM220W22---T
	33	16x20	175	EHT2WM330L20---T
	33	16x25	185	EHT2WM330L25---T
	47	18x25	215	EHT2WM470M25---T
	47	16x30	225	EHT2WM470L30---T
	56	18x25	255	EHT2WM560M25---T
	68	18x30	285	EHT2WM680M30---T
500	68	16x35	305	EHT2WM680L35---T
	82	18x35	355	EHT2WM820M35---T
	100	18x40	415	EHT2WM101M40---T
	120	18x45	420	EHT2WM121M45---T
	10	12.5x16	80	EHT2HM100W16---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA _{rms} /125°C, 120Hz)	Part Number
500	10	12.5x18	90	EHT2HM100W18---T
	12	12.5x18	100	EHT2HM120W18---T
	15	12.5x20	110	EHT2HM150W20---T
	15	12.5x30	125	EHT2HM150W30---T
	22	16x20	150	EHT2HM220L20---T
	33	16x25	175	EHT2HM330L25---T
	33	18x20	185	EHT2HM330M20---T
	47	18x30	215	EHT2HM470M30---T
	56	18x35	260	EHT2HM560M35---T

※Specifications subject to change without notice

HL series

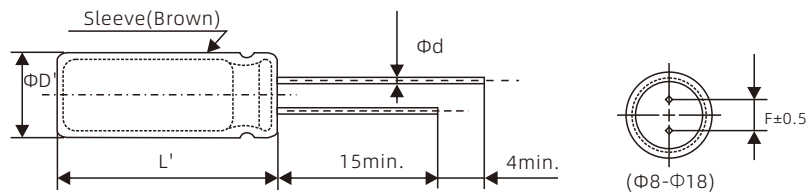
- Endurance: 8,000~12,000 hours at 105°C
- Long life, downsized, high ripple current, for power supply
- RoHS Compliant



SPECIFICATIONS

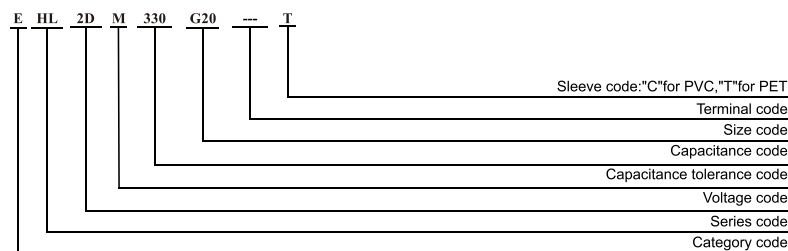
Items	Characteristics									
Category Temperature Range	-40 ~ +105°C(160 to 450Vdc)				-25 ~ +105°C(500Vdc)					
Rated Working Voltage Range	160 ~ 500Vdc									
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)									
Leakage Current		After 1 minute		After 5 minutes						
	CV≤1,000	I≤0.1CV+40μA		I≤0.03CV+15μA						
	CV > 1,000	I≤0.04CV+100μA		I≤0.02CV+25μA						
	Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C)									
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	160	200	250	350	400	450	500	(at 20°C, 120Hz)	
	Dissipation Factor(Max.)	0.18	0.18	0.18	0.24	0.24	0.24	0.24		
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)	160	200	250	350	400	450	500	(at 120Hz)	
	Z(-25°C)/Z(+20°C)	3	3	3	6	6	6	6		
	Z(-40°C)/Z(+20°C)	8	8	8	10	10	10	-		
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for the specified period of time at 105°C.									
	Capacitance Change	≤±20% of the initial value						Rated Voltage	160 to 450Vdc	500Vdc
	Dissipation Factor	≤200% of the initial specified value						Life Time	≤20: 10,000 hours	Φ10: 8,000 hours
	Leakage Current	≤The initial specified value							≥20: 12,000 hours	Φ≥12.5: 10,000 hours
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.									
	Capacitance Change	≤±20% of the initial value								
	Dissipation Factor	≤200% of the initial specified value								
	Leakage Current	≤200% of the initial specified value								

DIMENSIONS [mm]



ΦD	8	10	12.5	16	18	22
Φd	0.5	0.6	0.6	0.6	0.8	0.8
F	3.5	5.0	5.0	7.5	7.5	10.0
ΦD'	ΦD+0.5max.					
L'	L+2max.					

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF) \ Freq. (Hz)	120	1K	10K	100K
Cap. < 100	1.00	1.75	2.25	2.50
Cap. ≥ 100	1.00	1.67	2.05	2.25

HL series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
160	33	10x14	180	EHL2CM330G14---T
	47	10x20	300	EHL2CM470G20---T
	56	10x20	318	EHL2CM560G20---T
	68	12.5x20	377	EHL2CM680W20---T
	82	10x25	416	EHL2CM820G25---T
	82	10x30	448	EHL2CM820G30---T
	100	12.5x20	520	EHL2CM101W20---T
	120	10x35	572	EHL2CM121G35---T
	150	10x45	696	EHL2CM151G45---T
	150	12.5x25	767	EHL2CM151W25---T
	180	12.5x30	885	EHL2CM181W30---T
	180	16x20	858	EHL2CM181L20---T
	220	12.5x35	1,044	EHL2CM221W35---T
	220	16x25	1,022	EHL2CM221L25---T
	270	12.5x40	1,196	EHL2CM271W40---T
	270	12.5x45	1,230	EHL2CM271W45---T
	330	16x30	1,355	EHL2CM331L30---T
	330	18x25	1,292	EHL2CM331M25---T
	390	16x35	1,505	EHL2CM391L35---T
	470	18x35	1,722	EHL2CM471M35---T
	560	16x50	1,924	EHL2CM561L50---T
	560	18x40	1,910	EHL2CM561M40---T
	680	18x45	2,135	EHL2CM681M45---T
	680	18x50	2,148	EHL2CM681M50---T
200	33	10x18	225	EHL2DM330G18---T
	39	10x20	268	EHL2DM390G20---T
	47	10x20	302	EHL2DM470G20---T
	56	10x25	346	EHL2DM560G25---T
	68	10x30	406	EHL2DM680G30---T
	82	12.5x20	522	EHL2DM820W20---T
	100	12.5x25	628	EHL2DM101W25---T
	120	12.5x30	728	EHL2DM121W30---T
	120	16x20	698	EHL2DM121L20---T
	150	16x25	840	EHL2DM151L25---T
	180	16x25	928	EHL2DM181L25---T
	180	18x20	895	EHL2DM181M20---T
	220	12.5x45	1,116	EHL2DM221W45---T
	220	18x25	1,050	EHL2DM221M25---T
	270	16x35	1,252	EHL2DM271L35---T
	330	16x40	1,428	EHL2DM331L40---T
	390	16x45	1,575	EHL2DM391L45---T
	470	18x45	1,775	EHL2DM471M45---T
	560	18x50	1,952	EHL2DM561M50---T
250	27	10x16	172	EHL2EM270G16---T
	33	10x20	242	EHL2EM330G20---T
	47	10x25	316	EHL2EM470G25---T
	47	12.5x20	321	EHL2EM470W20---T
	56	12.5x20	430	EHL2EM560W20---T
	68	10x35	432	EHL2EM680G35---T
	82	10x45	518	EHL2EM820G45---T
	82	12.5x25	565	EHL2EM820W25---T
	100	12.5x30	662	EHL2EM101W30---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
250	100	16x20	638	EHL2EM101L20---T
	120	16x25	758	EHL2EM121L25---T
	120	18x20	732	EHL2EM121M20---T
	150	12.5x40	892	EHL2EM151W40---T
	150	12.5x45	922	EHL2EM151W45---T
	180	12.5x50	1,040	EHL2EM181W50---T
	180	16x30	995	EHL2EM181L30---T
	180	18x25	955	EHL2EM181M25---T
	220	16x35	1,130	EHL2EM221L35---T
	220	18x30	1,138	EHL2EM221M30---T
	270	16x45	1,315	EHL2EM271L45---T
	270	18x35	1,300	EHL2EM271M35---T
350	330	16x50	1,480	EHL2EM331L50---T
	330	18x40	1,466	EHL2EM331M40---T
	390	18x50	1,630	EHL2EM391M50---T
	15	10x16	150	EHL2VM150G16---T
	18	10x20	165	EHL2VM180G20---T
	22	10x20	200	EHL2VM220G20---T
	27	10x25	242	EHL2VM270G25---T
	27	10x30	256	EHL2VM270G30---T
	33	12.5x20	280	EHL2VM330W20---T
	39	10x35	326	EHL2VM390G35---T
	47	10x40	376	EHL2VM470G40---T
	47	12.5x25	425	EHL2VM470W25---T
400	56	10x45	426	EHL2VM560G45---T
	56	12.5x30	498	EHL2VM560W30---T
	56	16x20	476	EHL2VM560L20---T
	68	12.5x35	583	EHL2VM680W35---T
	68	18x20	550	EHL2VM680M20---T
	82	12.5x40	658	EHL2VM820W40---T
	82	16x25	628	EHL2VM820L25---T
	100	12.5x45	752	EHL2VM101W45---T
	100	16x30	744	EHL2VM101L30---T
	100	18x25	710	EHL2VM101M25---T
	120	16x35	832	EHL2VM121L35---T
	150	16x40	964	EHL2VM151L40---T
400	150	16x45	978	EHL2VM151L45---T
	150	18x30	944	EHL2VM151M30---T
	180	16x50	1,095	EHL2VM181L50---T
	180	18x40	1,086	EHL2VM181M40---T
	220	18x45	1,215	EHL2VM221M45---T
	220	18x50	1,222	EHL2VM221M50---T
	12	10x16	135	EHL2GM120G16---T
	15	10x20	155	EHL2GM150G20---T
	18	10x20	180	EHL2GM180G20---T
	22	10x25	216	EHL2GM220G25---T
	27	10x30	256	EHL2GM270G30---T
	27	12.5x20	300	EHL2GM270W20---T
400	33	16x20	320	EHL2GM330L20---T
	39	12.5x25	390	EHL2GM390W25---T
	47	12.5x30	456	EHL2GM470W30---T
	47	16x20	438	EHL2GM470L20---T

HL series

STANDARD RATINGS

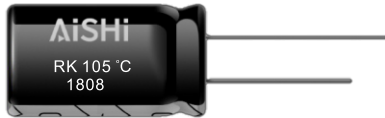
WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
400	56	12.5x35	528	EHL2GM560W35--T
	56	18x20	502	EHL2GM560M20--T
	68	12.5x40	600	EHL2GM680W40--T
	68	16x25	572	EHL2GM680L25--T
	82	16x30	672	EHL2GM820L30--T
	82	18x25	644	EHL2GM820M25--T
	100	16x35	760	EHL2GM101L35--T
	100	16x40	770	EHL2GM101L40--T
	120	16x40	797	EHL2GM121L40--T
	120	18x31	840	EHL2GM121M31--T
	120	18x35	875	EHL2GM121M35--T
	150	16x50	1,000	EHL2GM151L50--T
	150	18x40	985	EHL2GM151M40--T
	180	18x45	1,098	EHL2GM181M45--T
450	220	18x50	1,225	EHL2GM221M50--T
	10	10x16	120	EHL2WM100G16--T
	12	10x20	150	EHL2WM120G20--T
	15	10x22	161	EHL2WM150G22--T
	18	10x30	216	EHL2WM180G30--T
	18	12.5x20	256	EHL2WM180W20--T
	22	16x20	282	EHL2WM220L20--T
	27	10x40	292	EHL2WM270G40--T
	27	10x45	306	EHL2WM270G45--T
	27	12.5x25	342	EHL2WM270W25--T
	33	12.5x30	400	EHL2WM330W30--T
	33	16x20	386	EHL2WM330L20--T
	39	10x50	378	EHL2WM390G50--T
	39	12.5x35	462	EHL2WM390W35--T
	39	18x20	440	EHL2WM390M20--T
	47	12.5x40	528	EHL2WM470W40--T
	47	16x25	500	EHL2WM470L25--T
	56	12.5x45	592	EHL2WM560W45--T
	56	16x30	588	EHL2WM560L30--T
	56	18x25	562	EHL2WM560M25--T
	68	12.5x50	672	EHL2WM680W50--T
	68	16x35	664	EHL2WM680L35--T
	82	16x40	750	EHL2WM820L40--T
	82	18x30	734	EHL2WM820M30--T
	100	16x50	858	EHL2WM101L50--T
	100	18x35	836	EHL2WM101M35--T
	120	18x40	935	EHL2WM121M40--T
	120	22x31	901	EHL2WM121O31--T
	150	18x50	1,065	EHL2WM151M50--T
500	6.8	10x16	45	EHL2HM6R8G16--T
	10	10x30	130	EHL2HM100G30--T
	10	12.5x16	111	EHL2HM100W16--T
	12	12.5x18	125	EHL2HM120W18--T
	15	10x35	170	EHL2HM150G35--T
	15	12.5x20	155	EHL2HM150W20--T
	18	10x45	190	EHL2HM180G45--T
	18	12.5x30	190	EHL2HM180W30--T
500	22	10x50	230	EHL2HM220G50--T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
500	22	12.5x35	225	EHL2HM220W35--T
	22	16x20	220	EHL2HM220L20--T
	33	16x25	246	EHL2HM330L25--T
	47	18x30	400	EHL2HM470M30--T

※Specifications subject to change without notice

RK series

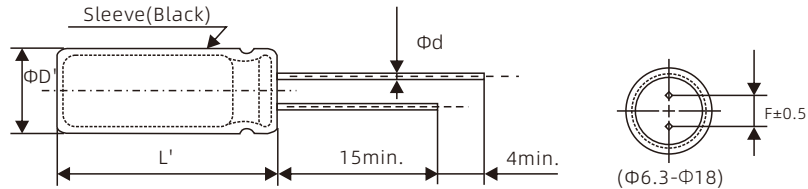
- Endurance:2,000 hours at 105°C
- Especially designed for charger
- Miniaturized, high voltage
- RoHS Compliant



SPECIFICATIONS

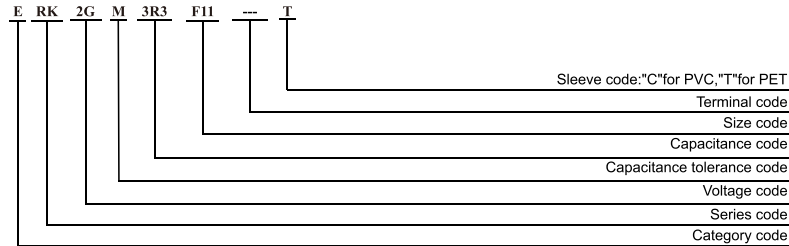
Items	Characteristics										
Category Temperature Range	-40 ~ +105°C (160 ~450Vdc)					-25 ~ +105°C (500 ~ 600Vdc)					
Rated Working Voltage Range	160 ~ 600Vdc										
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)										
Leakage Current	160~450Vdc		500~600Vdc								
	I≤0.02CV+10μA		I≤0.03CV+40μA								
	Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)										
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	160	200	250	350	400	450	500	550	600	(at 20°C,120Hz)
	Dissipation Factor(Max.)	0.15	0.15	0.15	0.15	0.2	0.24	0.24	0.24	0.24	
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (Vdc)	160	200	250	350	400	450	500	550	600	(at 120Hz)
	Z(-25°C)/ Z(+20°C)	3	3	3	6	6	6	8	15	15	
	Z(-40°C)/ Z(+20°C)	8	8	8	10	10	15	—	—	—	
Endurance	The following specification shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for 2000 hours at 105°C.										
	Capacitance Change	≤±30% of the initial value									
	Dissipation Factor	≤200% of the initial specified value									
	Leakage Current	≤The initial specified value									
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.										
	Capacitance Change	≤±20% of the initial value									
	Dissipation Factor	≤200% of the initial specifiedvalue									
	Leakage Current	≤200% of the initial specified value									

DIMENSIONS [mm]



ΦD	6.3	8	10	12.5	16	18
Φd	0.5	0.5	0.6	0.6	0.8	0.8
F	2.5	3.5	5.0	5.0	7.5	7.5
ΦD'	ΦD+0.5max.					
L'	L+2max.					

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

WV (Vdc)	Freq. (Hz)	120	1K	10K	100K
160~600		0.5	0.8	0.9	1

RK series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 100kHz)	Part Number
160	3.3	6.3x9	55	ERK2CM3R3E09--T
	4.7	6.3x9	65	ERK2CM4R7E09--T
	6.8	6.3x12	85	ERK2CM6R8E12--T
	8.2	8x9	100	ERK2CM8R2F09--T
	10	8x9	125	ERK2CM100F09--T
	15	8x10	175	ERK2CM150F10--T
	15	8x11	185	ERK2CM150F11--T
	22	8x12	210	ERK2CM220F12--T
	33	8x16	255	ERK2CM330F16--T
	33	10x12	275	ERK2CM330G12--T
	47	10x14	350	ERK2CM470G14--T
	47	10x16	365	ERK2CM470G16--T
	68	10x18	430	ERK2CM680G18--T
	68	10x20	450	ERK2CM680G20--T
200	4.7	6.3x11	60	ERK2DM4R7E11--T
	6.8	6.3x12	75	ERK2DM6R8E12--T
	8.2	8x11	90	ERK2DM8R2F11--T
	10	8x11	135	ERK2DM100F11--T
	15	8x12	190	ERK2DM150F12--T
	15	10x10	195	ERK2DM150G10--T
	22	10x12	230	ERK2DM220G12--T
	33	10x14	270	ERK2DM330G14--T
	47	10x16	365	ERK2DM470G16--T
	47	12.5x14	385	ERK2DM470W14--T
	68	12.5x18	455	ERK2DM680W18--T
250	4.7	8x9	75	ERK2EM4R7F09--T
	6.8	8x10	80	ERK2EM6R8F10--T
	8.2	8x11	100	ERK2EM8R2F11--T
	10	8x12	150	ERK2EM100F12--T
	15	10x10	200	ERK2EM150G10--T
	15	10x12	210	ERK2EM150G12--T
	22	10x14	255	ERK2EM220G14--T
	33	10x16	290	ERK2EM330G16--T
	47	12.5x16	380	ERK2EM470W16--T
	47	12.5x18	400	ERK2EM470W18--T
	68	12.5x20	475	ERK2EM680W20--T
350	4.7	8x10	80	ERK2VM4R7F10--T
	6.8	8x11	85	ERK2VM6R8F11--T
	8.2	8x12	105	ERK2VM8R2F12--T
	10	8x12	160	ERK2VM100F12--T
	15	10x12	210	ERK2VM150G12--T
	18	10x14	240	ERK2VM180G14--T
	22	10x16	265	ERK2VM220G16--T
	33	10x20	315	ERK2VM330G20--T
	47	12.5x20	420	ERK2VM470W20--T
	56	12.5x25	475	ERK2VM560W25--T
	68	16x20	520	ERK2VM680L20--T
	82	16x25	580	ERK2VM820L25--T
400	1	6.3x9	46	ERK2GM010E09--T
	1.8	6.3x9	56	ERK2GM1R8E09--T
	2.2	6.3x11	64	ERK2GM2R2E11--T
	2.2	8x9	66	ERK2GM2R2F09--T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 100kHz)	Part Number
400	3.3	6.3x11	74	ERK2GM3R3E11--T
	3.3	8x9	76	ERK2GM3R3F09--T
	3.3	8x11	80	ERK2GM3R3F11--T
	4.7	6.3x12	90	ERK2GM4R7E12--T
	4.7	8x9	94	ERK2GM4R7F09--T
	4.7	8x11	98	ERK2GM4R7F11--T
	4.7	10x9	102	ERK2GM4R7G09--T
	6.8	8x12	126	ERK2GM6R8F12--T
	6.8	10x9	132	ERK2GM6R8G09--T
	8.2	8x12	145	ERK2GM8R2F12--T
	8.2	10x9	150	ERK2GM8R2G09--T
	8.2	10x11	158	ERK2GM8R2G11--T
	10	8x14	180	ERK2GM100F14--T
	10	10x9	172	ERK2GM100G09--T
	15	10x14	210	ERK2GM150G14--T
	22	10x16	250	ERK2GM220G16--T
	33	12.5x18	520	ERK2GM330W18--T
	47	12.5x22	670	ERK2GM470W22--T
	56	13x25	780	ERK2GM560K25--T
	68	16x20	840	ERK2GM680L20--T
450	68	18x20	880	ERK2GM680M20--T
	82	16x25	920	ERK2GM820L25--T
	82	18x20	950	ERK2GM820M20--T
	100	18x25	1,060	ERK2GM101M25--T
	100	18x30	1,120	ERK2GM101M30--T
	1	6.3x9	46	ERK2WM010E09--T
	1	8x9	54	ERK2WM010F09--T
	1.8	6.3x11	62	ERK2WM1R8E11--T
	1.8	8x9	65	ERK2WM1R8F09--T
	2.2	8x9	70	ERK2WM2R2F09--T
	2.2	8x11	72	ERK2WM2R2F11--T
	3.3	8x11	82	ERK2WM3R3F11--T
	4.7	8x12	100	ERK2WM4R7F12--T
	4.7	10x10	100	ERK2WM4R7G10--T
	6.8	8x14	125	ERK2WM6R8F14--T
	6.8	10x12	148	ERK2WM6R8G12--T
	8.2	10x12	180	ERK2WM8R2G12--T
	10	10x14	200	ERK2WM100G14--T
	10	10x16	220	ERK2WM100G16--T
	15	10x16	230	ERK2WM150G16--T
450	15	12.5x16	250	ERK2WM150W16--T
	22	12.5x16	295	ERK2WM220W16--T
	33	12.5x20	495	ERK2WM330W20--T
	33	16x16	495	ERK2WM330L16--T
	33	16x20	550	ERK2WM330L20--T
	47	16x20	620	ERK2WM470L20--T
	47	16x25	640	ERK2WM470L25--T
	47	18x20	640	ERK2WM470M20--T
	68	18x20	870	ERK2WM680M20--T
	68	18x25	970	ERK2WM680M25--T
	82	18x25	1,065	ERK2WM820M25--T
	100	18x30	1,120	ERK2WM101M30--T

RK series

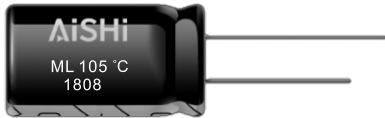
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 100kHz)	Part Number
450	100	18x35	1,240	ERK2WM101M35--T
	120	18x35	1,300	ERK2WM121M35--T
500	3.3	8x12	65	ERK2HM3R3F12--T
	4.7	8x14	110	ERK2HM4R7F14--T
	5.6	10x12	130	ERK2HM5R6G12--T
	6.8	10x12	150	ERK2HM6R8G12--T
	8.2	10x12	160	ERK2HM8R2G12--T
	8.2	10x16	190	ERK2HM8R2G16--T
	10	10x16	215	ERK2HM100G16--T
	15	10x18	235	ERK2HM150G18--T
	15	12.5x16	250	ERK2HM150W16--T
	22	12.5x20	310	ERK2HM220W20--T
	33	12.5x25	510	ERK2HM330W25--T
	47	16x25	655	ERK2HM470L25--T
	47	18X20	655	ERK2HM470M20--T
	68	16x30	910	ERK2HM680L30--T
550	100	18x35	1,120	ERK2HM101M35--T
	3.3	8x12	65	ERK2JM3R3F12--T
	4.7	8x14	100	ERK2JM4R7F14--T
	5.6	10x12	135	ERK2JM5R6G12--T
	6.8	10x14	145	ERK2JM6R8G14--T
	8.2	10x16	190	ERK2JM8R2G16--T
	10	10x16	215	ERK2JM100G16--T
	10	13x14	220	ERK2JM100K14--T
	15	13x16	245	ERK2JM150K16--T
	22	12.5x25	330	ERK2JM220W25--T
	47	18X25	685	ERK2JM470M25--T
	56	18x30	800	ERK2JM560M30--T
	68	18x35	850	ERK2JM680M35--T
600	4.7	10X12	105	ERK2KM4R7G12--T
	6.8	10X16	110	ERK2KM6R8G16--T
	8.2	10X18	130	ERK2KM8R2G18--T
	10	12.5X16	150	ERK2KM100W16--T
	15	13X20	190	ERK2KM150K20--T
	22	13X25	260	ERK2KM220K25--T

※Specifications subject to change without notice

ML series

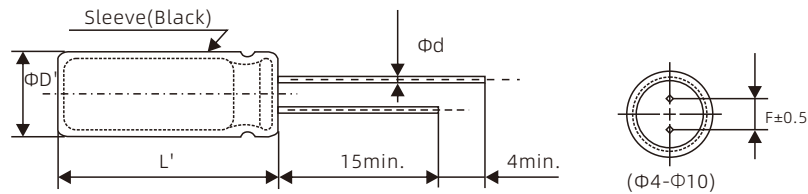
- Endurance: 5,000 hours at 105°C
- Long life with 7mm to 9mm height.
- RoHS Compliant



SPECIFICATIONS

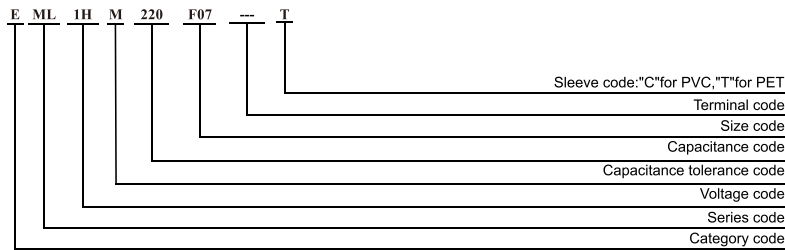
Items	Characteristics										
Category Temperature Range	-40~+105°C										
Rated Voltage Range	6.3~50 Vdc										
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)										
Leakage Current	Is0.01CV or 3μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)										
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	6.3	10	16	25	35	50				
	tanδ (max.)	0.40	0.35	0.30	0.25	0.20	0.20				
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)										
Low Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	(at 120Hz)			
	Z(-25°C)/ Z(+20°C)	6	4	4	3	2	2				
	Z(-40°C)/ Z(+20°C)	12	10	8	6	4	4				
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for the specified period of time at 105°C.										
	Capacitance Change	≤±30% of the initial value						Size Load life (hours) L≥7mm5,000			
	Dissipation Factor	≤300% of the initial specified value									
	Leakage Current	≤The initial specified value									
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.										
	Capacitance Change	≤±30% of the initial value									
	Dissipation Factor	≤300% of the initial specified value									
	Leakage Current	≤200% of the initial specified value									

DIMENSIONS [mm]



ΦD	4	5	6.3	8		10×9
Φd	0.45	0.45	0.5	0.5	0.5	0.6
F	1.5	2.0	2.5	3.5	3.5	5.0
ΦD'	ΦD+0.5MAX.					
L'	L+2MAX.					

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF) \ Freq. (Hz)	60(50)	120	500	1k	10k≤
Cap. < 2.2	0.50	1.00	1.20	1.30	1.5
2.2≤Cap. < 10	0.65	1.00	1.20	1.30	1.5
10≤Cap. < 100	0.80	1.00	1.20	1.30	1.5
Cap. ≥ 100	0.80	1.00	1.10	1.15	1.2

ML series

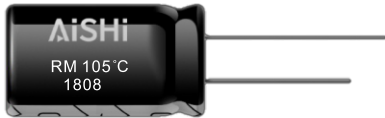
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
6.3	82	5×7	75	EML0JM820D07---T
	180	6.3×7	110	EML0JM181E07---T
	270	8×7	165	EML0JM271F07---T
	470	8×7	190	EML0JM471F07---T
	560	8×9	230	EML0JM561F09---T
	1,000	10×9	480	EML0JM102G09---T
10	33	4×7	43	EML1AM330C07---T
	56	5×7	68	EML1AM560D07---T
	120	6.3×7	100	EML1AM121E07---T
	220	8×7	160	EML1AM221F07---T
	330	8×7	180	EML1AM331F07---T
	470	8×9	210	EML1AM471F09---T
16	680	10×9	470	EML1AM681G09---T
	22	4×7	40	EML1CM220C07---T
	39	5×7	65	EML1CM390D07---T
	100	6.3×7	95	EML1CM101E07---T
	150	8×7	125	EML1CM151F07---T
	220	8×7	170	EML1CM221F07---T
25	330	8×9	195	EML1CM331F09---T
	470	10×9	460	EML1CM471G09---T
	15	4×7	35	EML1EM150C07---T
	27	5×7	57	EML1EM270D07---T
	56	6.3×7	85	EML1EM560E07---T
	100	8×7	112	EML1EM101F07---T
35	150	8×7	140	EML1EM151F07---T
	220	8×9	190	EML1EM221F09---T
	330	10×9	450	EML1EM331G09---T
	10	4×7	28	EML1VM100C07---T
	18	5×7	48	EML1VM180D07---T
	39	6.3×7	76	EML1VM390E07---T
50	56	8×7	105	EML1VM560F07---T
	100	8×7	125	EML1VM101F07---T
	150	8×9	180	EML1VM151F09---T
	220	10×9	360	EML1VM221G09---T
	4.7	4×7	23	EML1HM4R7C07---T
	10	5×7	30	EML1HM100D07---T
50	18	6.3×7	50	EML1HM180E07---T
	33	8×7	75	EML1HM330F07---T
	56	8×7	115	EML1HM560F07---T
	82	8×9	160	EML1HM820F09---T
	120	10×9	315	EML1HM121G09---T

※Specifications subject to change without notice

RM series

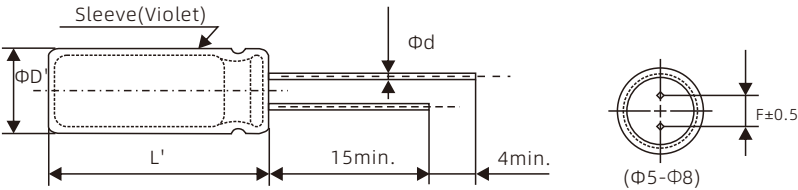
- Endurance: 10,000 hours at 105°C
- Miniaturized, long life
- RoHS Compliant



SPECIFICATIONS

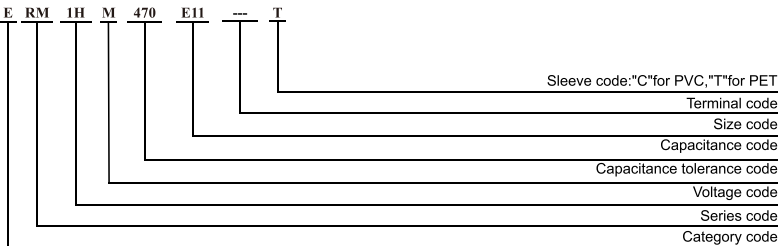
Items	Characteristics									
Category Temperature Range	-40~+105°C									
Rated Voltage Range	10~100Vdc									
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)									
Leakage Current	I ≤0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)									
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	10	16	25	35	50	63	100	(at 20°C, 120Hz)	
	Dissipation Factor(Max.)	0.45	0.35	0.30	0.22	0.19	0.17	0.15		
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.									
Low Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage (Vdc)	10	16	25	35	50	63	100	(120Hz)	
	Z(-25°C)/ Z(+20°C)	8	6	4		3				
	Z(-40°C)/ Z(+20°C)	13	10	8		7				
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for 10,000 hours at 105°C.									
	Capacitance Change	≤±25% of the initial value								
	Dissipation Factor	≤300% of the initial specified value								
	Leakage Current	≤The initial specified value								
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.									
	Capacitance Change	≤±20% of the initial value								
	Dissipation Factor	≤200% of the initial specified value								
	Leakage Current	≤200% of the initial specified value								

DIMENSIONS [mm]



ΦD	5	6.3	8
Φd	0.5	0.5	0.5
F	2.0	2.5	3.5
ΦD*	ØD+0.5max.		
L'	L+2max.		

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF) \ Freq. (Hz)	120	1k	10k	100k
Cap. < 22	0.42	0.60	0.80	1.00
22≤Cap. < 47	0.55	0.75	0.90	1.00
Cap. ≥47	0.70	0.85	0.95	1.00

RM series

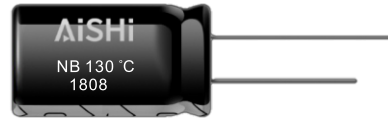
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 100kHz)	Part Number
10	100	5×11	130	ERM1AM101D11---T
	220	6.3×11	210	ERM1AM221E11---T
	330	6.3×12	220	ERM1AM331E12---T
	330	8×11	330	ERM1AM331F11---T
16	47	5×11	130	ERM1CM470D11---T
	100	6.3×11	210	ERM1CM101E11---T
	220	6.3×11	250	ERM1CM221E11---T
	220	8×11	330	ERM1CM221F11---T
25	33	5×11	130	ERM1EM330D11---T
	47	5×11	130	ERM1EM470D11---T
	68	5×12	140	ERM1EM680D12---T
	100	6.3×11	210	ERM1EM101E11---T
35	33	5×11	130	ERM1VM330D11---T
	47	6.3×11	210	ERM1VM470E11---T
	100	6.3×12	260	ERM1VM101E12---T
	100	8×11	330	ERM1VM101F11---T
	220	8×12	380	ERM1VM221F12---T
50	0.47	5×11	12	ERM1HMR47D11---T
	1	5×11	25	ERM1HM010D11---T
	2.2	5×11	35	ERM1HM2R2D11---T
	3.3	5×11	70	ERM1HM3R3D11---T
	4.7	5×11	80	ERM1HM4R7D11---T
	10	5×11	90	ERM1HM100D11---T
	22	5×12	110	ERM1HM220D12---T
	33	6.3×11	190	ERM1HM330E11---T
	47	6.3×11	190	ERM1HM470E11---T
	100	8×12	270	ERM1HM101F12---T
63	10	5×11	80	ERM1JM100D11---T
	22	6.3×11	170	ERM1JM220E11---T
	33	6.3×12	170	ERM1JM330E12---T
	47	8×12	240	ERM1JM470F12---T
	100	8×12	270	ERM1JM101F12---T
100	0.47	5×11	20	ERM1KMR47D11---T
	1	5×11	40	ERM1KM010D11---T
	2.2	5×11	50	ERM1KM2R2D11---T
	3.3	5×11	60	ERM1KM3R3D11---T
	4.7	5×11	70	ERM1KM4R7D11---T
	10	6.3×12	150	ERM1KM100E12---T
	22	8×12	230	ERM1KM220F12---T

※Specifications subject to change without notice

NB series

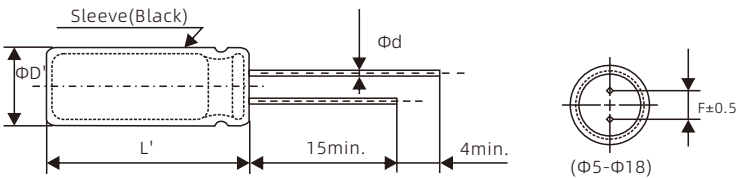
- Endurance: 2,000~ 5,000 hours at 130°C
- High reliability, high temperature
- RoHS Compliant



SPECIFICATIONS

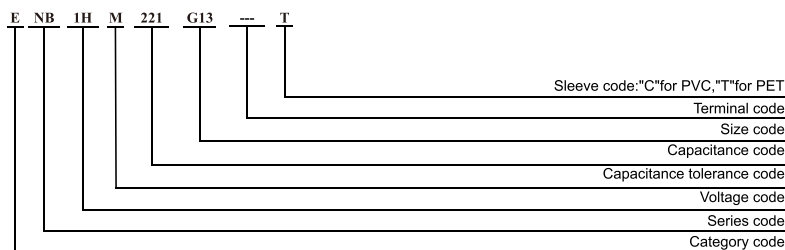
Items	Characteristics											
Category Temperature Range	-25--+130°C											
Rated Voltage Range	10~120Vdc											
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)											
Leakage Current	I ≤0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)											
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	10	16	25	35	50	63	80	100	120	(at 20°C,120Hz)	
	Dissipation Factor(Max.)	0.24	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.12		
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.											
Low Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage (Vdc)	10	16	25	35	50	63	80	100	120	(120Hz)	
	Z(-25°C)/Z(+20°C)	3		2						3		
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for a specified period of time at 130°C.										Case Dia	Life time (hours)
											ØD≤6.3	2,000
	Capacitance Change	≤±30% of the initial value									ØD=8	3,000
	Dissipation Factor	≤300% of the initial specified value									ØD=10	4,000
	Leakage Current	≤The initial specified value									ØD=12.5	5,000
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 130°C for 1,000 hours.											
	Capacitance Change	≤±30% of the initial value										
	Dissipation Factor	≤300% of the initial specified value										
	Leakage Current	≤500% of the initial specified value										

DIMENSIONS [mm]



ΦD	5	6.3	8	10	12.5	13	16	18
Φd	0.5	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	3.5	5.0	5.0	7.5	7.5
ΦD'	ØD+0.5max.							
L'	L+2max.							

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	Freq. (Hz)	50/60	120	1k	10k	100k
Cap. < 10		0.35	0.42	0.60	0.80	1.00
10 ≤ Cap. < 47		0.45	0.55	0.75	0.90	1.00
47 ≤ Cap. < 470		0.60	0.70	0.85	0.95	1.00
470 ≤ Cap. < 2,200		0.65	0.75	0.90	0.98	1.00
Cap. ≥ 2,200		0.75	0.80	0.95	1.00	1.00

NB series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/130°C, 100kHz)	Part Number
10	100	5×11	80	ENB1AM101D11---T
	330	6.3×12	180	ENB1AM331E12---T
	330	8×11	360	ENB1AM331F11---T
	470	8×12	360	ENB1AM471F12---T
	470	10×13	620	ENB1AM471G13---T
	680	8×12	400	ENB1AM681F12---T
	680	10×13	620	ENB1AM681G13---T
	1,000	10×16	660	ENB1AM102G16---T
	1,000	10×20	960	ENB1AM102G20---T
	2,200	12.5×25	1,430	ENB1AM222W25---T
16	3,300	16×25	1,900	ENB1AM332L25---T
	4,700	16×30	2,300	ENB1AM472L30---T
	100	5×11	90	ENB1CM101D11---T
	220	6.3×11	125	ENB1CM221E11---T
	330	8×12	360	ENB1CM331F12---T
	470	8×12	360	ENB1CM471F12---T
	470	10×13	620	ENB1CM471G13---T
	1,000	10×20	960	ENB1CM102G20---T
	2,200	10×25	980	ENB1CM222G25---T
	2,200	12.5×25	1,430	ENB1CM222W25---T
25	3,300	16×30	2,300	ENB1CM332L30---T
	4,700	16×35	2,550	ENB1CM472L35---T
	47	5×11	60	ENB1EM470D11---T
	68	5×12	90	ENB1EM680D12---T
	100	6.3×11	145	ENB1EM101E11---T
	220	8×12	360	ENB1EM221F12---T
	330	8×12	360	ENB1EM331F12---T
	330	10×13	620	ENB1EM331G13---T
	470	8×16	610	ENB1EM471F16---T
	470	10×13	640	ENB1EM471G13---T
35	1,000	10×20	960	ENB1EM102G20---T
	1,000	12.5×20	1,100	ENB1EM102W20---T
	2,200	16×30	2,300	ENB1EM222L30---T
	3,300	16×35	2,550	ENB1EM332L35---T
	47	6.3×11	110	ENB1VM470E11---T
	100	6.3×12	210	ENB1VM101E12---T
	100	8×11	360	ENB1VM101F11---T
	220	8×12	375	ENB1VM221F12---T
	220	10×13	620	ENB1VM221G13---T
	330	8×16	550	ENB1VM331F16---T
50	330	10×13	620	ENB1VM331G13---T
	330	10×16	800	ENB1VM331G16---T
	470	10×16	705	ENB1VM471G16---T
	470	10×20	960	ENB1VM471G20---T
	680	12.5×20	990	ENB1VM681W20---T
	1,000	12.5×20	1,180	ENB1VM102W20---T
	1,000	12.5×25	1,430	ENB1VM102W25---T
	2,200	16×35	2,550	ENB1VM222L35---T
	3,300	18×35	2,800	ENB1VM332M35---T
	1	5×11	26	ENB1HM010D11---T
50	2.2	5×11	35	ENB1HM2R2D11---T
	2.2	8×11	50	ENB1HM2R2F11---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/130°C, 100kHz)	Part Number
50	3.3	5×11	40	ENB1HM3R3D11---T
	3.3	8×11	70	ENB1HM3R3F11---T
	4.7	5×11	42	ENB1HM4R7D11---T
	4.7	8×11	100	ENB1HM4R7F11---T
	10	5×11	90	ENB1HM100D11---T
	10	8×11	200	ENB1HM100F11---T
	22	5×12	110	ENB1HM220D12---T
	22	8×11	260	ENB1HM220F11---T
	33	6.3×11	150	ENB1HM330E11---T
	33	8×11	300	ENB1HM330F11---T
63	47	6.3×11	180	ENB1HM470E11---T
	47	8×11	300	ENB1HM470F11---T
	100	8×12	340	ENB1HM101F12---T
	100	10×13	520	ENB1HM101G13---T
	220	8×16	520	ENB1HM221F16---T
	220	10×13	520	ENB1HM221G13---T
	330	10×16	530	ENB1HM331G16---T
	330	12.5×20	1,000	ENB1HM331W20---T
	470	10×20	950	ENB1HM471G20---T
	470	12.5×25	1,200	ENB1HM471W25---T
80	680	12.5×20	1,060	ENB1HM681W20---T
	680	16×20	1,250	ENB1HM681L20---T
	1,000	12.5×25	1,500	ENB1HM102W25---T
	1,000	16×30	2,180	ENB1HM102L30---T
	2,200	18×40	2,800	ENB1HM222M40---T
	33	6.3×12	150	ENB1JM330E12---T
	33	8×11	250	ENB1JM330F11---T
	47	8×12	250	ENB1JM470F12---T
	47	10×13	400	ENB1JM470G13---T
	100	8×12	340	ENB1JM101F12---T
100	100	10×16	450	ENB1JM101G16---T
	220	10×16	450	ENB1JM221G16---T
	220	12.5×20	820	ENB1JM221W20---T
	330	12.5×20	850	ENB1JM331W20---T
	330	12.5×25	1,000	ENB1JM331W25---T
	470	13×25	1,000	ENB1JM471K25---T
	470	16×25	1,500	ENB1JM471L25---T
	1,000	16×30	1,850	ENB1JM102L30---T
	4.7	5×11	26	ENB1BM4R7D11---T
	10	5×11	68	ENB1BM100D11---T
100	22	6.3×11	105	ENB1BM220E11---T
	33	6.3×12	135	ENB1BM330E12---T
	33	8×12	250	ENB1BM330F12---T
	68	8×12	250	ENB1BM680F12---T
	100	8×16	400	ENB1BM101F16---T
	150	10×16	450	ENB1BM151G16---T
	220	10×20	750	ENB1BM221G20---T
	330	12.5×20	850	ENB1BM331W20---T
	470	16×20	1,200	ENB1BM471L20---T
	4.7	5×11	40	ENB1KM4R7D11---T
100	4.7	8×11	100	ENB1KM4R7F11---T
	10	6.3×11	130	ENB1KM100E11---T

NB series

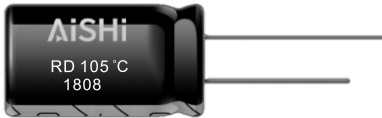
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/130°C, 100kHz)	Part Number
100	10	8×11	200	ENB1KM100F11--T
	22	6.3×12	150	ENB1KM220E12--T
	22	8×12	220	ENB1KM220F12--T
	33	8×12	220	ENB1KM330F12--T
	33	10×13	260	ENB1KM330G13--T
	47	8×16	240	ENB1KM470F16--T
	47	10×16	330	ENB1KM470G16--T
	100	10×16	350	ENB1KM101G16--T
	100	12.5×20	670	ENB1KM101W20--T
	220	13×20	720	ENB1KM221K20--T
	220	16×25	1,100	ENB1KM221L25--T
	330	16×25	1,300	ENB1KM331L25--T
	330	16×30	1,300	ENB1KM331L30--T
120	470	18×30	1,600	ENB1KM471M30---T
	22	8×12	115	ENB2BM220F12--T
	33	8×16	200	ENB2BM330F16--T
	33	10×13	200	ENB2BM330G13--T
	47	8×20	240	ENB2BM470F20--T
	47	10×16	240	ENB2BM470G16--T
	56	10×16	255	ENB2BM560G16--T
	68	10×16	255	ENB2BM680G16--T
	82	10×20	270	ENB2BM820G20--T
	100	10×25	340	ENB2BM101G25--T
	120	12.5×20	465	ENB2BM121W20--T
	150	12.5×25	515	ENB2BM151W25--T
	220	12.5×30	630	ENB2BM221W30--T
	220	16×20	630	ENB2BM221L20--T
	270	16×25	720	ENB2BM271L25--T
	270	18×20	720	ENB2BM271M20--T
	330	16×30	775	ENB2BM331L30--T
	330	18×25	775	ENB2BM331M25--T
	470	16×40	865	ENB2BM471L40--T
	470	18×30	865	ENB2BM471M30---T

※Specifications subject to change without notice

RD series

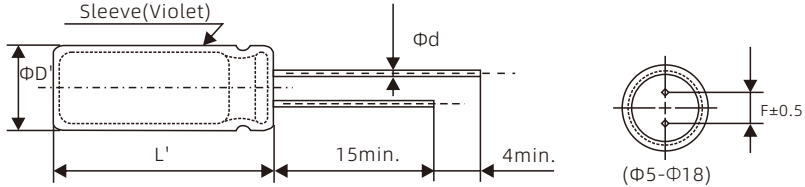
- Endurance: 2,000~5,000 hours at 105°C
- High frequency, low impedance
- RoHS Compliant



SPECIFICATIONS

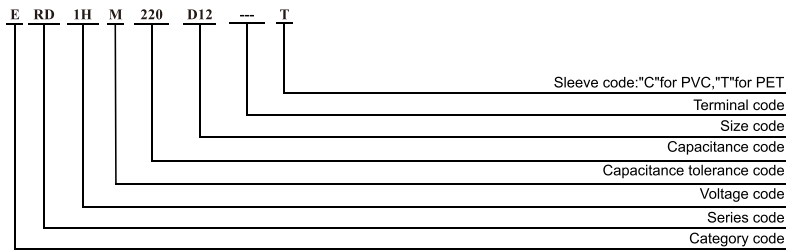
Items	Characteristics										
Category Temperature Range	-40~+105°C										
Rated Working Voltage Range	6.3~100 Vdc										
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)										
Leakage Current	I≤0.01CV or 3μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)										
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	100		
	tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08		
When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)											
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	100	(at 120Hz)	
	Z(-25°C)/Z(+20°C)	4	3	2							
	Z(-40°C)/Z(+20°C)	8	6	4	3						
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for the specified period of time at 105°C.										
								Case size	Load life (hours)		
	Capacitance Change							≤±25% of the initial value	ØD≤6.3		2,000
	Dissipation Factor							≤200% of the initial specified value	ØD=8		3,000
	Leakage Current							≤The initial specified value	ØD≥10		5,000
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.										
	Capacitance Change							≤±25% of the initial value			
	Dissipation Factor							≤200% of the initial specified value			
	Leakage Current							≤200% of the initial specified value			

DIMENSIONS [mm]



ΦD	5	6.3	8	10	12.5	16	18
Φd	0.5	0.5	0.5	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	3.5	5.0	5.0	7.5
ΦD*	ΦD+0.5MAX.						
L'	L+2MAX.						

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF) \ Freq. (Hz)	120	1k	10k	100k
Cap. < 220	0.40	0.75	0.90	1.00
220≤Cap. < 680	0.50	0.85	0.94	1.00
680≤Cap. < 2,200	0.60	0.87	0.95	1.00
2,200≤Cap. < 4,700	0.75	0.90	0.95	1.00
Cap. ≥4,700	0.85	0.95	0.98	1.00

RD series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
6.3	100	5×11	1.0	170	ERD0JM101D11---T
	120	5×11	0.92	175	ERD0JM121D11---T
	150	6.3×11	0.81	220	ERD0JM151E11---T
	180	6.3×11	0.76	210	ERD0JM181E11---T
	220	6.3×11	0.65	310	ERD0JM221E11---T
	270	6.3×11	0.54	320	ERD0JM271E11---T
	330	8×11	0.42	390	ERD0JM331F11---T
	470	8×11	0.25	450	ERD0JM471F11---T
	560	8×11	0.23	490	ERD0JM561F11---T
	680	8×11	0.21	520	ERD0JM681F11---T
	820	8×16	0.20	620	ERD0JM821F16---T
	1,000	10×13	0.17	750	ERD0JM102G13---T
	1,200	10×16	0.16	860	ERD0JM122G16---T
	1,500	10×16	0.14	1,100	ERD0JM152G16---T
	1,800	10×20	0.11	1,250	ERD0JM182G20---T
	2,200	10×25	0.095	1,470	ERD0JM222G25---T
	2,700	12.5×20	0.075	1,500	ERD0JM272W20---T
	3,300	12.5×20	0.036	1,650	ERD0JM332W20---T
	4,700	12.5×30	0.036	2,100	ERD0JM472W30---T
	5,600	12.5×30	0.034	2,340	ERD0JM562W30---T
	6,800	16×25	0.032	2,450	ERD0JM682L25---T
	8,200	16×30	0.027	2,650	ERD0JM822L30---T
	10,000	16×35	0.024	2,700	ERD0JM103L35---T
	15,000	18×35	0.023	2,950	ERD0JM153M35---T
10	22	5×11	2.7	98	ERD1AM220D11---T
	33	5×11	2.6	100	ERD1AM330D11---T
	47	5×11	1.34	150	ERD1AM470D11---T
	56	5×11	1.23	160	ERD1AM560D11---T
	68	5×11	1.05	170	ERD1AM680D11---T
	100	5×11	0.80	210	ERD1AM101D11---T
	120	6.3×11	0.75	250	ERD1AM121E11---T
	150	6.3×11	0.61	290	ERD1AM151E11---T
	180	6.3×11	0.46	320	ERD1AM181E11---T
	220	6.3×11	0.35	340	ERD1AM221E11---T
	270	8×11	0.30	400	ERD1AM271F11---T
	330	8×11	0.27	460	ERD1AM331F11---T
	470	8×11	0.25	580	ERD1AM471F11---T
	560	10×13	0.16	635	ERD1AM561G13---T
	680	10×13	0.11	765	ERD1AM681G13---T
	820	10×16	0.10	890	ERD1AM821G16---T
	1,000	10×16	0.076	1,040	ERD1AM102G16---T
	1,200	10×16	0.067	1,200	ERD1AM122G16---T

RD series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
10	1,500	10×20	0.062	1,400	ERD1AM152G20---T
	1,800	10×25	0.058	1,550	ERD1AM182G25---T
	2,200	12.5×20	0.041	1,750	ERD1AM222W20---T
	2,700	12.5×20	0.035	1,900	ERD1AM272W20---T
	3,300	12.5×25	0.031	2,000	ERD1AM332W25---T
	4,700	16×25	0.030	2,100	ERD1AM472L25---T
	5,600	16×25	0.028	2,290	ERD1AM562L25---T
	6,800	16×30	0.026	2,650	ERD1AM682L30---T
	8,200	16×35	0.026	2,770	ERD1AM822L35---T
	10,000	18×35	0.024	2,580	ERD1AM103M35---T
	10	5×11	4.7	74	ERD1CM100D11---T
16	22	5×11	2.6	100	ERD1CM220D11---T
	33	5×11	2.0	114	ERD1CM330D11---T
	47	5×11	1.1	155	ERD1CM470D11---T
	56	5×11	0.82	180	ERD1CM560D11---T
	68	5×11	0.69	195	ERD1CM680D11---T
	100	6.3×11	0.50	265	ERD1CM101E11---T
	120	6.3×11	0.47	270	ERD1CM121E11---T
	150	6.3×11	0.41	290	ERD1CM151E11---T
	180	8×11	0.34	370	ERD1CM181F11---T
	220	8×11	0.25	480	ERD1CM221F11---T
	270	8×11	0.21	520	ERD1CM271F11---T
	330	8×12	0.156	290	ERD1CM331F12---T
	470	10×13	0.124	750	ERD1CM471G13---T
	560	10×13	0.105	785	ERD1CM561G13---T
	680	10×16	0.092	1,100	ERD1CM681G16---T
	820	10×16	0.078	1,140	ERD1CM821G16---T
	1,000	10×20	0.065	1,350	ERD1CM102G20---T
	1,200	10×25	0.061	1,500	ERD1CM122G25---T
	1,500	12.5×20	0.060	1,380	ERD1CM152W20---T
	1,800	12.5×20	0.047	1,800	ERD1CM182W20---T
	2,200	12.5×25	0.038	2,000	ERD1CM222W25---T
	2,700	12.5×25	0.033	2,450	ERD1CM272W25---T
	3,300	16×25	0.030	2,790	ERD1CM332L25---T
	4,700	16×30	0.026	2,880	ERD1CM472L30---T
	5,600	16×35	0.03	2,990	ERD1CM562L35---T
	6,800	18×35	0.024	3,200	ERD1CM682M35---T
	8,200	18×35	0.024	3,320	ERD1CM822M35---T
	10,000	18×40	0.024	3,550	ERD1CM103M40---T
25	10	5×11	2.56	85	ERD1EM100D11---T
	22	5×11	1.95	125	ERD1EM220D11---T
	33	5×11	1.42	155	ERD1EM330D11---T

RD series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
25	47	6.3×11	1.00	220	ERD1EM470E11---T
	56	6.3×11	0.79	250	ERD1EM560E11---T
	68	6.3×11	0.65	280	ERD1EM680E11---T
	100	6.3×11	0.35	370	ERD1EM101E11---T
	120	6.3×11	0.33	380	ERD1EM121E11---T
	150	8×11	0.31	410	ERD1EM151F11---T
	180	8×11	0.25	455	ERD1EM181F11---T
	220	8×11	0.15	550	ERD1EM221F11---T
	270	10×13	0.125	720	ERD1EM271G13---T
	330	10×13	0.114	820	ERD1EM331G13---T
	470	10×16	0.076	1,200	ERD1EM471G16---T
	560	10×16	0.072	1,250	ERD1EM561G16---T
	680	10×20	0.065	1,320	ERD1EM681G20---T
	820	10×25	0.052	1,530	ERD1EM821G25---T
	1,000	12.5×20	0.045	1,650	ERD1EM102W20---T
	1,200	12.5×25	0.041	1,980	ERD1EM122W25---T
	1,500	12.5×25	0.038	2,210	ERD1EM152W25---T
	1,800	16×25	0.032	2,510	ERD1EM182L25---T
	2,200	16×25	0.036	2,650	ERD1EM222L25---T
	2,700	16×25	0.031	2,820	ERD1EM272L25---T
	3,300	16×30	0.026	3,240	ERD1EM332L30---T
	4,700	16×35	0.024	3,650	ERD1EM472L35---T
	5,600	18×35	0.024	3,720	ERD1EM562M35---T
	6,800	18×40	0.024	3,850	ERD1EM682M40---T
35	10	5×11	2.37	105	ERD1VM100D11---T
	22	5×11	1.50	150	ERD1VM220D11---T
	33	5×11	1.21	180	ERD1VM330D11---T
	47	6.3×11	0.80	280	ERD1VM470E11---T
	56	6.3×11	0.64	310	ERD1VM560E11---T
	68	8×11	0.52	350	ERD1VM680F11---T
	100	8×11	0.25	450	ERD1VM101F11---T
	120	8×11	0.22	510	ERD1VM121F11---T
	150	8×12	0.191	540	ERD1VM151F12---T
	180	10×13	0.172	650	ERD1VM181G13---T
	220	10×13	0.114	750	ERD1VM221G13---T
	270	10×16	0.095	910	ERD1VM271G16---T
	330	10×16	0.079	1,050	ERD1VM331G16---T
	470	10×20	0.065	1,200	ERD1VM471G20---T
	560	10×25	0.061	1,500	ERD1VM561G25---T
	680	12.5×20	0.056	1,570	ERD1VM681W20---T
	820	12.5×20	0.048	1,700	ERD1VM821W20---T
	1,000	12.5×25	0.042	1,900	ERD1VM102W25---T

RD series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
35	1,200	12.5×30	0.039	2,130	ERD1VM122W30---T
	1,500	16×25	0.036	2,270	ERD1VM152L25---T
	1,800	16×30	0.035	2,700	ERD1VM182L30---T
	2,200	16×30	0.034	2,780	ERD1VM222L30---T
	2,700	16×35	0.029	2,850	ERD1VM272L35---T
	3,300	18×35	0.026	3,100	ERD1VM332M35---T
	4,700	18×40	0.024	3,500	ERD1VM472M40---T
50	0.47	5×11	5.4	25	ERD1HMR47D11---T
	1	5×11	4.0	40	ERD1HM010D11---T
	2.2	5×11	2.8	55	ERD1HM2R2D11---T
	3.3	5×11	2.2	60	ERD1HM3R3D11---T
	4.7	5×11	2.0	90	ERD1HM4R7D11---T
	5.6	5×11	1.93	105	ERD1HM5R6D11---T
	6.8	5×11	1.89	110	ERD1HM6R8D11---T
	10	5×11	1.82	120	ERD1HM100D11---T
	22	6.3×11	1.25	150	ERD1HM220E11---T
	33	6.3×11	0.8	250	ERD1HM330E11---T
	47	6.3×11	0.65	290	ERD1HM470E11---T
	56	8×11	0.49	310	ERD1HM560F11---T
	68	8×11	0.33	375	ERD1HM680F11---T
	100	10×13	0.17	480	ERD1HM101G13---T
	120	10×13	0.156	530	ERD1HM121G13---T
	150	10×13	0.132	590	ERD1HM151G13---T
	180	10×16	0.114	860	ERD1HM181G16---T
	220	10×16	0.096	830	ERD1HM221G16---T
	270	10×20	0.078	960	ERD1HM271G20---T
	330	10×25	0.065	1,150	ERD1HM331G25---T
	470	12.5×20	0.055	1,590	ERD1HM471W20---T
	560	12.5×20	0.050	1,660	ERD1HM561W20---T
	680	12.5×25	0.044	1,930	ERD1HM681W25---T
	820	12.5×30	0.039	2,100	ERD1HM821W30---T
	1,000	16×25	0.036	2,300	ERD1HM102L25---T
	1,200	16×30	0.036	2,650	ERD1HM122L30---T
	1,500	16×35	0.034	2,750	ERD1HM152L35---T
	1,800	16×35	0.034	2,850	ERD1HM182L35---T
	2,200	18×35	0.032	3,040	ERD1HM222M35---T
	2,700	18×40	0.027	3,070	ERD1HM272M40---T
	3,300	18×40	0.025	3,100	ERD1HM332M40---T
63	0.47	5×11	5.4	25	ERD1JMR47D11---T
	1	5×11	4.0	33	ERD1JM010D11---T
	2.2	5×11	2.8	45	ERD1JM2R2D11---T
	3.3	5×11	2.2	58	ERD1JM3R3D11---T

RD series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
63	4.7	5×11	2.0	65	ERD1JM4R7D11---T
	5.6	5×11	1.9	95	ERD1JM5R6D11---T
	6.8	5×11	1.82	100	ERD1JM6R8D11---T
	10	5×11	1.75	110	ERD1JM100D11---T
	22	6.3×11	0.80	240	ERD1JM220E11---T
	33	8×11	0.61	270	ERD1JM330F11---T
	47	8×12	0.56	300	ERD1JM470F12---T
	56	8×12	0.38	330	ERD1JM560F12---T
	68	10×13	0.21	480	ERD1JM680G13---T
	100	10×16	0.14	610	ERD1JM101G16---T
	120	10×16	0.13	620	ERD1JM121G16---T
	150	10×16	0.11	700	ERD1JM151G16---T
	180	10×20	0.10	800	ERD1JM181G20---T
	220	10×20	0.08	1,100	ERD1JM221G20---T
	270	12.5×20	0.065	1,150	ERD1JM271W20---T
	330	12.5×20	0.055	1,250	ERD1JM331W20---T
	470	12.5×25	0.053	1,620	ERD1JM471W25---T
	560	12.5×25	0.049	1,630	ERD1JM561W25---T
	680	12.5×30	0.043	1,950	ERD1JM681W30---T
	820	16×25	0.038	2,150	ERD1JM821L25---T
100	1,000	16×30	0.034	2,350	ERD1JM102L30---T
	1,200	16×35	0.032	2,550	ERD1JM122L35---T
	1,500	18×35	0.031	2,710	ERD1JM152M35---T
	1,800	18×40	0.027	3,000	ERD1JM182M40---T
	0.47	5×11	5.9	20	ERD1KMR47D11---T
	1	5×11	4.4	30	ERD1KM010D11---T
	2.2	5×11	3.3	42	ERD1KM2R2D11---T
	3.3	5×11	2.8	55	ERD1KM3R3D11---T
	4.7	5×11	2.6	72	ERD1KM4R7D11---T
	5.6	5×11	2.33	100	ERD1KM5R6D11---T
	6.8	6.3×11	1.95	115	ERD1KM6R8E11---T
	10	6.3×11	1.77	130	ERD1KM100E11---T
	22	8×12	0.85	220	ERD1KM220F12---T
	33	10×13	0.69	320	ERD1KM330G13---T
	47	10×13	0.58	370	ERD1KM470G13---T
	56	10×16	0.42	440	ERD1KM560G16---T
	68	10×16	0.35	470	ERD1KM680G16---T
	100	10×25	0.3	560	ERD1KM101G25---T
	120	10×25	0.22	660	ERD1KM121G25---T
	150	12.5×20	0.174	780	ERD1KM151W20---T
	180	12.5×20	0.142	820	ERD1KM181W20---T
	220	12.5×25	0.13	880	ERD1KM221W25---T

RD series

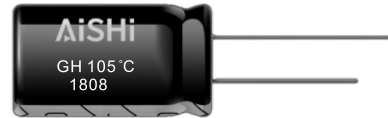
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
100	270	12.5×30	0.11	1,120	ERD1KM271W30---T
	330	16×25	0.10	1,440	ERD1KM331L25---T
	470	16×30	0.09	1,650	ERD1KM471L30---T
	560	16×35	0.085	1,720	ERD1KM561L35---T
	680	18×35	0.080	1,790	ERD1KM681M35---T
	820	18×35	0.071	1,840	ERD1KM821M35---T
	1,000	18×40	0.066	1,930	ERD1KM102M40---T

※Specifications subject to change without notice

GH series

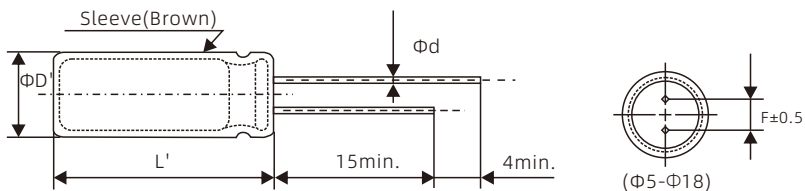
- Endurance: 5,000~ 10,000 hours at 105°C
- Especially designed for electronic ballast, intelligent instrument, etc.
- RoHS Compliant



SPECIFICATIONS

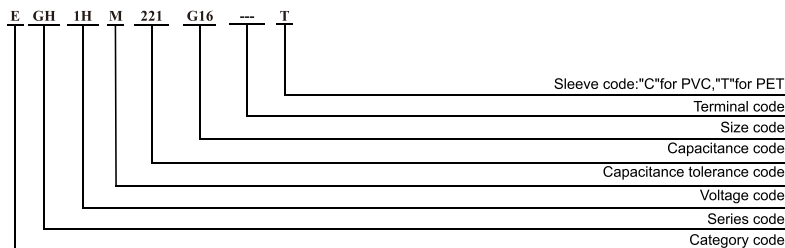
Items	Characteristics													
Category Temperature Range	-40~+105°C													
Rated Voltage Range	6.3~450Vdc													
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)													
Leakage Current	6.3 to 100Vdc				160~450Vdc						I: leakage current(μA), C: Nominal capacitance(μF) V: Rated voltage(V) (at 20°C)			
	CV	After 2 minutes			I ≤ 0.01CV+10uA (2 minutes)									
	CV≤1,000	I ≤ 0.01 CV or 3uA Whichever is greater												
	CV > 1,000	I ≤ 0.006CV + 4uA												
Dissipation Factor (tanδ)	Rated Voltage (Vdc)		6.3	10	16	25	35	50	63	100	160~250	350~450	(at 20°C, 120Hz)	
	Dissipation Factor(Max.)		0.30	0.24	0.20	0.18	0.16	0.14	0.12	0.10	0.15	0.20		
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.													
Low Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage (Vdc)		6.3	10	16	25	35	50	63	100	160~250	350~450	(120Hz)	
	Z(-25°C)/ Z(+20°C)		5	4	3	2				3		6		
	Z(-40°C)/ Z(+20°C)		12	10	8	5	4	3			7	7		
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for a specified period of time at 105°C.										Case Dia.	Life time (hours)		
												6.3~10V	16~100V	160~450V
	Capacitance Change		≤±20% of the initial value(6.3V, 10V: ≤±30%)							ØD≤6.3	5,000		-	
	Dissipation Factor		≤200% of the initial specified value							ØD=8&10	6,000	7,000	10,000	
	Leakage Current		≤The initial specified value							ØD≥12.5	8,000			
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.													
	Capacitance Change		≤±20% of the initial value(6.3V, 10V: ≤±30%)											
	Dissipation Factor		≤200% of the initial specified value											
	Leakage Current		≤200% of the initial specified value											

DIMENSIONS [mm]



ΦD	5	6.3	8	10	12.5	16	18
Φd	0.5	0.5	0.5	0.6	0.6	0.6	0.8
F	2.0	2.5	3.5	3.5	5.0	5.0	7.5
ΦD'	ΦD+0.5MAX.						
L'	L+2MAX.						

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	50/60	100/200	1k	10k	100k
Cap. ≤ 330	0.35	0.5	0.75	0.85	1.00
330 < Cap. ≤ 1,500	0.45	0.65	0.85	0.90	1.00
Cap. > 1,500	0.53	0.75	0.90	0.95	1.00

GH series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 100kHz)	Part Number
6.3	150	5×11	91	EGH0JM151D11--T
	330	6.3×11	151	EGH0JM331E11--T
	680	8×12	228	EGH0JM681F12--T
	820	10×13	256	EGH0JM821G13--T
	1,000	8×16	272	EGH0JM102F16--T
	1,200	8×20	386	EGH0JM122F20--T
	1,200	10×16	386	EGH0JM122G16--T
	1,500	10×20	513	EGH0JM152G20--T
	1,800	12.5×16	513	EGH0JM182W16--T
	2,200	10×25	580	EGH0JM222G25--T
	2,700	10×30	630	EGH0JM272G30--T
	3,300	12.5×20	665	EGH0JM332W20--T
	3,900	12.5×25	807	EGH0JM392W25--T
	4,700	12.5×30	902	EGH0JM472W30--T
	5,600	12.5×35	1,034	EGH0JM562W35--T
	5,600	16×20	1,034	EGH0JM562L20--T
	6,800	12.5×40	1,190	EGH0JM682W40--T
	6,800	16×25	1,190	EGH0JM682L25--T
	6,800	18×20	1,190	EGH0JM682M20--T
	8,200	16×30	1,400	EGH0JM822L30--T
10	100	5×11	91	EGH1AM101D11--T
	220	6.3×11	151	EGH1AM221E11--T
	470	8×12	228	EGH1AM471F12--T
	680	8×16	256	EGH1AM681F16--T
	680	10×13	272	EGH1AM681G13--T
	1,000	8×20	400	EGH1AM102F20--T
	1,000	10×16	430	EGH1AM102G16--T
	1,200	10×20	513	EGH1AM122G20--T
	1,500	10×25	580	EGH1AM152G25--T
	1,500	12.5×16	580	EGH1AM152W16--T
	2,200	10×30	630	EGH1AM222G30--T
	2,200	12.5×20	681	EGH1AM222W20--T
	3,300	12.5×25	807	EGH1AM332W25--T
	3,900	12.5×30	902	EGH1AM392W30--T
	3,900	16×20	902	EGH1AM392L20--T
	4,700	16×25	1,116	EGH1AM472L25--T
	5,600	12.5×40	1,190	EGH1AM562W40--T
	5,600	16×25	1,190	EGH1AM562L25--T
	5,600	18×20	1,190	EGH1AM562M20--T
	6,800	16×30	1,400	EGH1AM682L30--T
16	56	5×11	100	EGH1CM560D11--T
	120	6.3×11	118	EGH1CM121E11--T
	330	8×12	205	EGH1CM331F12--T
	470	8×16	256	EGH1CM471F16--T
	470	10×13	272	EGH1CM471G13--T
	680	8×20	386	EGH1CM681F20--T
	680	10×16	386	EGH1CM681G16--T
	1,000	10×20	513	EGH1CM102G20--T
	1,000	12.5×16	513	EGH1CM102W16--T
	1,200	10×25	580	EGH1CM122G25--T
	1,500	10×30	630	EGH1CM152G30--T
	1,500	12.5×20	665	EGH1CM152W20--T
	2,200	12.5×25	807	EGH1CM222W25--T
	2,700	12.5×30	902	EGH1CM272W30--T
	2,700	16×20	902	EGH1CM272L20--T
	3,300	12.5×35	1,034	EGH1CM332W35--T
	3,900	12.5×40	1,190	EGH1CM392W40--T
	3,900	16×25	1,190	EGH1CM392L25--T
	3,900	18×20	1,190	EGH1CM392M20--T
	4,700	16×30	1,400	EGH1CM472L30--T
25	47	5×11	124	EGH1EM470D11--T
	100	6.3×11	138	EGH1EM101E11--T
	220	8×12	205	EGH1EM221F12--T
	330	8×16	225	EGH1EM331F16--T
	330	10×13	245	EGH1EM331G13--T
	470	8×20	320	EGH1EM471F20--T
	470	10×16	340	EGH1EM471G16--T
	680	10×20	345	EGH1EM681G20--T
	680	12.5×16	345	EGH1EM681W16--T
	820	10×25	450	EGH1EM821G25--T
	1,000	10×30	540	EGH1EM102G30--T
	1,000	12.5×20	540	EGH1EM102W20--T
	1,500	12.5×25	665	EGH1EM152W25--T
	1,800	12.5×30	790	EGH1EM182W30--T
	1,800	16×20	800	EGH1EM182L20--T
	2,200	12.5×35	860	EGH1EM222W35--T
	2,200	18×20	880	EGH1EM222M20--T
	2,700	12.5×40	960	EGH1EM272W40--T
	2,700	16×25	980	EGH1EM272L25--T
	3,300	16×30	1,190	EGH1EM332L30--T
100	100	5×11	124	EGH1EM470D11--T
	100	6.3×11	138	EGH1EM101E11--T
	220	8×12	205	EGH1EM221F12--T
	330	8×16	225	EGH1EM331F16--T
	330	10×13	245	EGH1EM331G13--T
	470	8×20	320	EGH1EM471F20--T
	470	10×16	340	EGH1EM471G16--T
	680	10×20	345	EGH1EM681G20--T
	680	12.5×16	345	EGH1EM681W16--T
	820	10×25	450	EGH1EM821G25--T
	1,000	10×30	540	EGH1EM102G30--T
	1,000	12.5×20	540	EGH1EM102W20--T
	1,500	12.5×25	665	EGH1EM152W25--T
	1,800	12.5×30	790	EGH1EM182W30--T
	1,800	16×20	800	EGH1EM182L20--T
	2,200	12.5×35	860	EGH1EM222W35--T
	2,200	18×20	880	EGH1EM222M20--T
	2,700	12.5×40	960	EGH1EM272W40--T
	2,700	16×25	980	EGH1EM272L25--T
	3,300	16×30	1,190	EGH1EM332L30--T

GH series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mAmps/105°C, 100kHz)	Part Number
35	33	5×11	90	EGH1VM330D11---T
	56	6.3×11	110	EGH1VM560E11---T
	150	8×12	180	EGH1VM151F12---T
	220	8×16	240	EGH1VM221F16---T
	220	10×13	252	EGH1VM221G13---T
	270	8×20	280	EGH1VM271F20---T
	330	10×16	312	EGH1VM331G16---T
	470	10×20	386	EGH1VM471G20---T
	470	12.5×16	394	EGH1VM471W16---T
	560	10×25	450	EGH1VM561G25---T
	680	10×30	496	EGH1VM681G30---T
	680	12.5×20	520	EGH1VM681W20---T
	1,000	12.5×25	810	EGH1VM102W25---T
	1,200	12.5×30	860	EGH1VM122W30---T
	1,200	16×25	880	EGH1VM122L25---T
	1,500	12.5×35	880	EGH1VM152W35---T
	1,800	12.5×40	960	EGH1VM182W40---T
	1,800	16×20	900	EGH1VM182L20---T
	1,800	18×20	960	EGH1VM182M20---T
	2,200	16×30	1,190	EGH1VM222L30---T
	2,200	18×25	1,190	EGH1VM222M25---T
	2,700	16×35	1,400	EGH1VM272L35---T
	2,700	18×30	1,400	EGH1VM272M30---T
	3,300	16×40	1,600	EGH1VM332L40---T
	3,300	18×35	1,600	EGH1VM332M35---T
	3,900	18×40	1,850	EGH1VM392M40---T
50	22	5×11	84	EGH1HM220D11---T
	56	6.3×11	146	EGH1HM560E11---T
	100	8×12	152	EGH1HM101F12---T
	120	8×16	180	EGH1HM121F16---T
	150	10×13	215	EGH1HM151G13---T
	180	8×20	246	EGH1HM181F20---T
	220	10×16	291	EGH1HM221G16---T
	270	10×20	330	EGH1HM271G20---T
	270	12.5×16	330	EGH1HM271W16---T
	330	10×25	386	EGH1HM331G25---T
	470	10×30	460	EGH1HM471G30---T
	470	12.5×20	475	EGH1HM471W20---T
	560	12.5×25	520	EGH1HM561W25---T
	680	12.5×30	665	EGH1HM681W30---T
	820	12.5×35	800	EGH1HM821W35---T
	820	16×20	800	EGH1HM821L20---T
	1,000	12.5×40	880	EGH1HM102W40---T
	1,000	16×25	880	EGH1HM102L25---T
	1,000	18×20	880	EGH1HM102M20---T
	1,200	16×30	1,190	EGH1HM122L30---T
	1,200	18×25	1,190	EGH1HM122M25---T
	1,500	16×35	1,400	EGH1HM152L35---T
	1,800	16×40	1,600	EGH1HM182L40---T
	1,800	18×30	1,600	EGH1HM182M30---T
	2,200	18×35	1,800	EGH1HM222M35---T
	2,700	18×40	1,850	EGH1HM272M40---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mAmps/105°C, 100kHz)	Part Number
63	15	5×11	62	EGH1JM150D11---T
	33	6.3×11	126	EGH1JM330E11---T
	56	8×12	198	EGH1JM560F12---T
	82	8×16	246	EGH1JM820F16---T
	82	10×13	252	EGH1JM820G13---T
	120	8×20	300	EGH1JM121F20---T
	120	10×16	310	EGH1JM121G16---T
	180	10×20	386	EGH1JM181G20---T
	180	12.5×16	394	EGH1JM181W16---T
	220	10×25	450	EGH1JM221G25---T
	270	12.5×20	520	EGH1JM271W20---T
	330	12.5×25	665	EGH1JM331W25---T
	470	12.5×30	790	EGH1JM471W30---T
	470	16×20	800	EGH1JM471L20---T
	560	12.5×35	860	EGH1JM561W35---T
	560	16×25	880	EGH1JM561L25---T
	680	12.5×40	960	EGH1JM681W40---T
	680	18×20	980	EGH1JM681M20---T
	820	16×30	1,190	EGH1JM821L30---T
	820	18×25	1,190	EGH1JM821M25---T
	1,000	16×35	1,400	EGH1JM102L35---T
	1,000	18×30	1,400	EGH1JM102M30---T
	1,200	16×40	1,600	EGH1JM122L40---T
	1,200	18×35	1,600	EGH1JM122M35---T
	1,500	18×40	1,850	EGH1JM152M40---T
100	6.8	5×11	62	EGH1KM6R8D11---T
	15	6.3×11	126	EGH1KM150E11---T
	27	8×12	198	EGH1KM270F12---T
	39	8×16	246	EGH1KM390F16---T
	47	10×13	252	EGH1KM470G13---T
	56	8×20	300	EGH1KM560F20---T
	68	10×16	330	EGH1KM680G16---T
	82	10×20	386	EGH1KM820G20---T
	82	12.5×16	394	EGH1KM820W16---T
	100	10×25	450	EGH1KM101G25---T
	120	12.5×20	520	EGH1KM121W20---T
	180	12.5×25	665	EGH1KM181W25---T
	220	16×20	800	EGH1KM221L20---T
	220	12.5×30	790	EGH1KM221W30---T
	270	12.5×35	860	EGH1KM271W35---T
	270	16×25	880	EGH1KM271L25---T
	330	18×20	980	EGH1KM331M20---T
	330	12.5×40	960	EGH1KM331W40---T
	390	16×30	1,190	EGH1KM391L30---T
	390	18×25	1,190	EGH1KM391M25---T
	470	16×35	1,400	EGH1KM471L35---T
	470	18×30	1,400	EGH1KM471M30---T
	560	16×40	1,600	EGH1KM561L40---T
	680	18×35	1,600	EGH1KM681M35---T
	820	18×40	1,850	EGH1KM821M40---T
160	4.7	8×9	90	EGH2CM4R7F09---T
	4.7	8×11	100	EGH2CM4R7F11---T

GH series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mAmps/105°C, 100kHz)	Part Number
160	5.6	8×12	115	EGH2CM5R6F12---T
	6.8	8×12	125	EGH2CM6R8F12---T
	8.2	8×12	135	EGH2CM8R2F12---T
	10	8×12	150	EGH2CM100F12---T
	12	10×12	180	EGH2CM120G12---T
	15	10×16	230	EGH2CM150G16---T
	22	10×16	280	EGH2CM220G16---T
	33	10×18	350	EGH2CM330G18---T
	39	10×20	390	EGH2CM390G20---T
	47	10×20	440	EGH2CM470G20---T
	47	12.5×16	480	EGH2CM470W16---T
	56	12.5×18	600	EGH2CM560W18---T
	68	12.5×20	740	EGH2CM680W20---T
	82	12.5×20	780	EGH2CM820W20---T
	82	16×20	800	EGH2CM820L20---T
	100	12.5×25	850	EGH2CM101W25---T
	100	16×20	860	EGH2CM101L20---T
	150	16×20	1,000	EGH2CM151L20---T
	150	16×25	1,040	EGH2CM151L25---T
	220	16×25	1,560	EGH2CM221L25---T
	220	18×25	1,600	EGH2CM221M25---T
	330	18×30	1,880	EGH2CM331M30---T
200	10	10×12	170	EGH2DM100G12---T
	12	10×16	200	EGH2DM120G16---T
	15	10×16	236	EGH2DM150G16---T
	22	10×20	280	EGH2DM220G20---T
	33	10×20	320	EGH2DM330G20---T
	33	12.5×20	340	EGH2DM330W20---T
	39	12.5×20	400	EGH2DM390W20---T
	47	12.5×20	500	EGH2DM470W20---T
	68	12.5×20	620	EGH2DM680W20---T
	68	12.5×25	660	EGH2DM680W25---T
	82	16×20	760	EGH2DM820L20---T
	100	16×20	840	EGH2DM101L20---T
	100	16×25	880	EGH2DM101L25---T
	150	16×25	1,160	EGH2DM151L25---T
	150	16×30	1,200	EGH2DM151L30---T
	150	18×25	1,200	EGH2DM151M25---T
	220	18×25	1,400	EGH2DM221M25---T
	220	18×30	1,440	EGH2DM221M30---T
	330	18×35	1,800	EGH2DM331M35---T
	330	18×40	1,840	EGH2DM331M40---T
250	4.7	8×12	116	EGH2EM4R7F12---T
	5.6	10×12	130	EGH2EM5R6G12---T
	6.8	10×12	144	EGH2EM6R8G12---T
	10	10×20	200	EGH2EM100G20---T
	22	10×20	336	EGH2EM220G20---T
	33	12.5×20	420	EGH2EM330W20---T
	39	12.5×20	496	EGH2EM390W20---T
	47	12.5×20	600	EGH2EM470W20---T
	47	12.5×25	640	EGH2EM470W25---T
	68	16×20	800	EGH2EM680L20---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mAmps/105°C, 100kHz)	Part Number
250	82	16x20	880	EGH2EM820L20—T
	82	16x30	920	EGH2EM820L30—T
	100	16x25	1,020	EGH2EM101L25—T
	100	18x25	1,060	EGH2EM101M25—T
	150	18x25	1,200	EGH2EM151M25—T
	220	18x31	1,440	EGH2EM221M31—T
	220	18x40	1,480	EGH2EM221M40—T
350	4.7	8x12	110	EGH2VM4R7F12—T
	5.6	10x12	130	EGH2VM5R6G12—T
	6.8	10x12	160	EGH2VM6R8G12—T
	10	10x16	200	EGH2VM100G16—T
	22	12.5x20	364	EGH2VM220W20—T
	33	16x20	480	EGH2VM330L20—T
	39	16x20	530	EGH2VM390L20—T
	47	16x20	580	EGH2VM470L20—T
	47	16x25	610	EGH2VM470L25—T
	68	16x25	740	EGH2VM680L25—T
	68	18x20	740	EGH2VM680M20—T
	68	18x25	780	EGH2VM680M25—T
	82	18x25	860	EGH2VM820M25—T
	100	18x25	960	EGH2VM101M25—T
	100	18x30	1,000	EGH2VM101M30—T
	120	18x30	1,100	EGH2VM121M30—T
	150	18x35	1,200	EGH2VM151M35—T
400	1	8x12	50	EGH2GM010F12—T
	2.2	8x12	70	EGH2GM2R2F12—T
	3.3	8x12	110	EGH2GM3R3F12—T
	4.7	10x12	130	EGH2GM4R7G12—T
	6.8	10x12	150	EGH2GM6R8G12—T
	10	10x16	200	EGH2GM100G16—T
	15	12.5x16	270	EGH2GM150W16—T
	22	12.5x20	350	EGH2GM220W20—T
	22	12.5x25	370	EGH2GM220W25—T
	33	16x20	510	EGH2GM330L20—T
	39	16x25	580	EGH2GM390L25—T
	47	16x25	660	EGH2GM470L25—T
	47	18x20	660	EGH2GM470M20—T
	47	16x30	700	EGH2GM470L30—T
	56	10x50	780	EGH2GM560G50—T
	68	12.5x40	880	EGH2GM680W40—T
	68	18x25	880	EGH2GM680M25—T
	82	12.5x45	900	EGH2GM820W45—T
	82	18x25	960	EGH2GM820M25—T
	82	18x30	1,000	EGH2GM820M30—T
	100	12.5x50	1,100	EGH2GM101W50—T
100	18x31	1,100	EGH2GM101M31—T	
100	18x35	1,140	EGH2GM101M35—T	
120	18x35	1,260	EGH2GM121M35—T	
150	18x40	1,400	EGH2GM151M40—T	
450	6.8	10x16	150	EGH2WM6R8G16—T
	10	10x20	200	EGH2WM100G20—T
	15	12.5x20	270	EGH2WM150W20—T

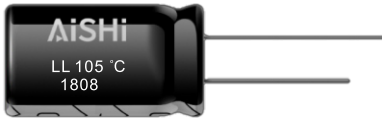
GH series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 100kHz)	Part Number
450	22	16x20	380	EGH2WM220L20---T
	33	10x40	510	EGH2WM330G40---T
	33	16x25	520	EGH2WM330L25---T
	33	18x20	550	EGH2WM330M20---T
	39	10x45	620	EGH2WM390G45---T
	39	18x25	620	EGH2WM390M25---T
	47	12.5x40	700	EGH2WM470W40---T
	47	18x25	700	EGH2WM470M25---T
	56	12.5x40	780	EGH2WM560W40---T
	68	18x30	880	EGH2WM680M30---T
	82	12.5x50	1,000	EGH2WM820W50---T
	82	18x35	1,000	EGH2WM820M35---T
	100	18x40	1,120	EGH2WM101M40---T

※Specifications subject to change without notice

LL series

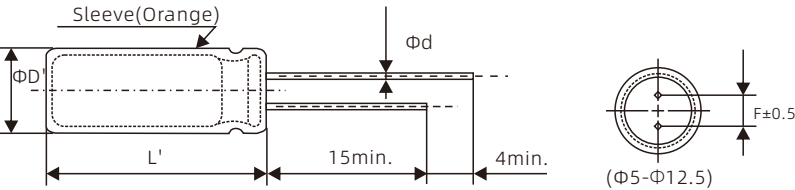


- Endurance: 2,000 hours at 105°C
- Stable and extremely low leakage current characteristics
- Wide temperature range of -40°C to +105°C
- RoHS Compliant

SPECIFICATIONS

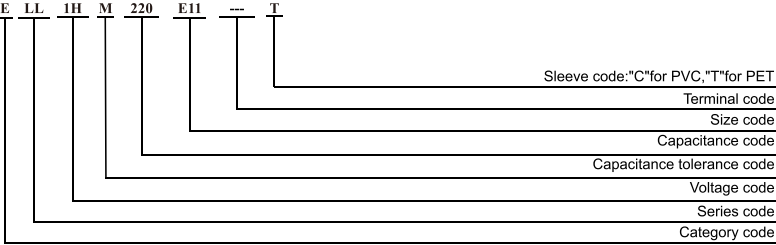
Items	Characteristics									
Category Temperature Range	-40~+105°C									
Rated Working Voltage Range	6.3~100 Vdc									
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)									
Leakage Current	I≤0.002CV or 0.4μA, whichever is greater. Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)									
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	100	
	tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.10	0.10	
	When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C,120Hz)									
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	100	
	Z(-25°C)/Z(+20°C)	4	3	3	2	2	2	2	2	
	Z(-40°C)/Z(+20°C)	8	6	6	4	4	3	3	3	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for 2,000 hours at 105°C.									
	Capacitance Change	≤±20% of the initial value								
	Dissipation Factor	≤200% of the initial specified value								
	Leakage Current	≤The initial specified value								
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied.									
	Capacitance Change	≤±20% of the initial value								
	Dissipation Factor	≤200% of the initial specified value								
	Leakage Current	≤200% of the initial specified value								

DIMENSIONS [mm]



ΦD	4	5	6.3	8	10	12.5
Φd	0.45	0.45	0.5	0.5	0.6	0.6
F	1.5	2.0	2.5	3.5	5.0	5.0
ΦD'	ΦD+0.5MAX.					
L'	L+2MAX.					

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	50/60	120	1k	10k	100k
Cap. < 110	0.80	1.00	1.45	1.65	1.70
110≤Cap. < 1,000	0.80	1.00	1.36	1.48	1.53
Cap. ≥1,000	0.85	1.00	1.25	1.35	1.38

LL series

STANDARD RATINGS

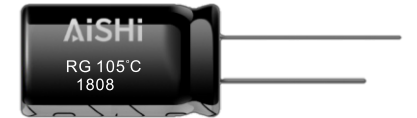
WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
6.3	22	5×11	36	ELL0JM220D11---T
	33	5×11	44	ELL0JM330D11---T
	47	5×11	53	ELL0JM470D11---T
	100	5×11	74	ELL0JM101D11---T
	220	6.3×11	131	ELL0JM221E11---T
	330	6.3×11	161	ELL0JM331E11---T
	470	8×11	242	ELL0JM471F11---T
	1,000	10×13	390	ELL0JM102G13---T
10	2,200	12.5×20	665	ELL0JM222W20---T
	22	5×11	50	ELL1AM220D11---T
	33	5×11	66	ELL1AM330D11---T
	47	5×11	75	ELL1AM470D11---T
	100	5×11	104	ELL1AM101D11---T
	220	8×11	193	ELL1AM221F11---T
	330	8×11	256	ELL1AM331F11---T
	470	8×11	319	ELL1AM471F11---T
16	1,000	10×16	605	ELL1AM102G16---T
	2,200	12.5×20	860	ELL1AM222W20---T
	10	5×11	39	ELL1CM100D11---T
	22	5×11	62	ELL1CM220D11---T
	33	5×11	68	ELL1CM330D11---T
	47	5×11	105	ELL1CM470D11---T
	100	6.3×11	138	ELL1CM101E11---T
	220	8×11	220	ELL1CM221F11---T
25	330	8×11	268	ELL1CM331F11---T
	470	10×13	407	ELL1CM471G13---T
	1,000	10×20	704	ELL1CM102G20---T
	2,200	12.5×25	890	ELL1CM222W25---T
	10	5×11	43	ELL1EM100D11---T
	22	5×11	65	ELL1EM220D11---T
	33	5×11	76	ELL1EM330D11---T
	47	6.3×11	116	ELL1EM470E11---T
35	100	8×11	149	ELL1EM101F11---T
	220	10×13	246	ELL1EM221G13---T
	330	10×13	352	ELL1EM331G13---T
	470	10×16	484	ELL1EM471G16---T
	1,000	12.5×20	847	ELL1EM102W20---T
	10	5×11	48	ELL1VM100D11---T
	22	6.3×11	71	ELL1VM220E11---T
	33	6.3×11	83	ELL1VM330E11---T
50	47	6.3×11	125	ELL1VM470E11---T
	100	8×11	187	ELL1VM101F11---T
	220	10×13	330	ELL1VM221G13---T
	330	10×16	440	ELL1VM331G16---T
	470	12.5×20	590	ELL1VM471W20---T
	1,000	12.5×25	1,012	ELL1VM102W25---T
	0.47	5×11	12	ELL1HMR47D11---T
	1	5×11	17	ELL1HM010D11---T
50	2.2	5×11	24	ELL1HM2R2D11---T
	3.3	5×11	29	ELL1HM3R3D11---T
	4.7	5×11	36	ELL1HM4R7D11---T
	10	5×11	52	ELL1HM100D11---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
50	22	6.3×11	77	ELL1HM220E11---T
	33	6.3×11	99	ELL1HM330E11---T
	47	8×11	138	ELL1HM470F11---T
	100	10×13	217	ELL1HM101G13---T
	220	10×20	380	ELL1HM221G20---T
	330	12.5×20	506	ELL1HM331W20---T
63	470	12.5×25	705	ELL1HM471W25---T
	0.47	5×11	12	ELL1JMR47D11---T
	1	5×11	17	ELL1JM010D11---T
	2.2	5×11	24	ELL1JM2R2D11---T
	3.3	5×11	32	ELL1JM3R3D11---T
	4.7	5×11	39	ELL1JM4R7D11---T
	10	6.3×11	58	ELL1JM101G11---T
	22	6.3×11	94	ELL1JM220E11---T
	33	8×11	110	ELL1JM330F11---T
	47	8×11	152	ELL1JM470F11---T
	100	10×16	260	ELL1JM101G16---T
	220	10×20	440	ELL1JM221G20---T
	330	12.5×20	594	ELL1JM331W20---T
	0.47	5×11	12	ELL1KMR47D11---T
100	1	5×11	17	ELL1KM010D11---T
	2.2	5×11	24	ELL1KM2R2D11---T
	3.3	5×11	32	ELL1KM3R3D11---T
	4.7	6.3×11	39	ELL1KM4R7E11---T
	10	8×11	61	ELL1KM100F11---T
	22	8×11	106	ELL1KM220F11---T
	33	10×13	142	ELL1KM330G13---T
	47	10×16	184	ELL1KM470G16---T
	100	12.5×20	300	ELL1KM101W20---T
	220	12.5×30	533	ELL1KM221W30---T

※Specifications subject to change without notice

RG series

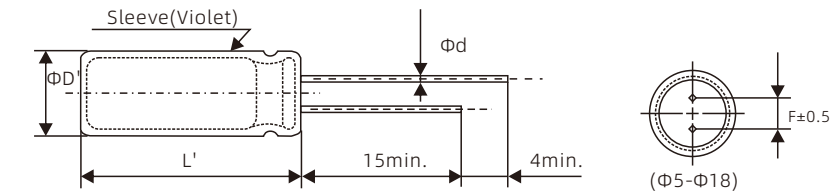
- Endurance; 2,000~ 8,000 hours at 105°C
- Low impedance, high frequency
- Good low temperature performance, high reliability
- RoHS Compliant



SPECIFICATIONS

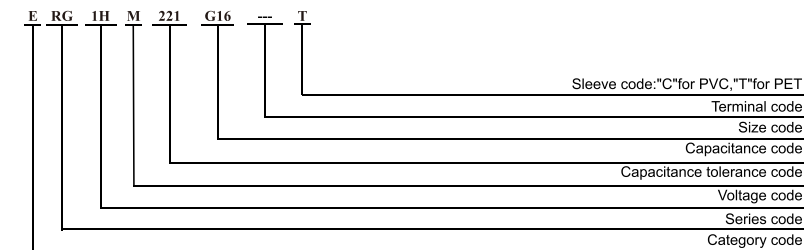
Items	Characteristics											
Category Temperature Range	-55~+105°C											
Rated Voltage Range	6.3~100Vdc											
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)											
Leakage Current	I ≤0.01CV or 3μA, whichever is greater. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)											
Dissipation Factor (tanδ)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	100	(at 20°C,120Hz)		
	Dissipation Factor(Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.08			
	When nominal capacitance exceeds 1,000 μF, add 0.02 to the value above for each 1,000 μF increase.											
Low Temperature Characteristics (Max.Impedance Ratio)	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	80	(120Hz)		
	Z(-25°C)/ Z(+20°C)	4	3	2								
	Z(-55°C)/ Z(+20°C)	8	6	4	3							
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for a specified period of time at 105°C.									Case Dia	Life time (hours)	
										ØD≤6.3	2,000	
										ØD=8	3,000	
	Capacitance Change	≤±25% of the initial value									ØD=10	5,000
	Dissipation Factor	≤200% of the initial specified value									ØD=12.5	7,000
	Leakage Current	≤The initial specified value									ØD≥16	8,000
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.											
	Capacitance Change	≤±25% of the initial value										
	Dissipation Factor	≤200% of the initial specified value										
	Leakage Current	≤200% of the initial specified value										

DIMENSIONS [mm]



ΦD	5	6.3	8	10	12.5	16	18
Φd	0.5	0.5	0.5	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ΦD'	ØD+0.5max.						
L'	L+2max.						

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	Freq. (Hz)	120	1k	10k	100k
Cap. < 220		0.40	0.75	0.90	1.00
220≤Cap. < 680		0.50	0.85	0.94	1.00
680≤Cap. < 2,200		0.60	0.87	0.95	1.00
2,200≤Cap. < 4,700		0.75	0.90	0.95	1.00
Cap. ≥4,700		0.85	0.95	0.98	1.00

RG series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
6.3	100	5×11	0.650	155	ERG0JM101D11---T
	220	6.3×11	0.400	255	ERG0JM221E11---T
	330	6.3×11	0.250	290	ERG0JM331E11---T
	470	8×11	0.180	400	ERG0JM471F11---T
	560	8×11	0.170	460	ERG0JM561F11---T
	680	8×11	0.130	550	ERG0JM681F11---T
	820	8×16	0.095	730	ERG0JM821F16---T
	1,000	8×16	0.090	730	ERG0JM102F16---T
	1,200	8×20	0.080	810	ERG0JM122F20---T
	1,500	10×20	0.052	1,220	ERG0JM152G20---T
	2,200	10×20	0.045	1,440	ERG0JM222G20---T
	2,700	10×30	0.037	1,690	ERG0JM272G30---T
	3,300	12.5×20	0.038	1,660	ERG0JM332W20---T
	3,900	12.5×25	0.030	1,950	ERG0JM392W25---T
	4,700	12.5×30	0.025	2,310	ERG0JM472W30---T
	5,600	12.5×35	0.022	2,510	ERG0JM562W35---T
	6,800	12.5×40	0.017	2,870	ERG0JM682W40---T
	8,200	16×30	0.019	3,010	ERG0JM822L30---T
	10,000	16×35	0.017	3,150	ERG0JM103L35---T
10	100	5×11	0.580	175	ERG1AM101D11---T
	220	6.3×11	0.250	290	ERG1AM221E11---T
	330	8×11	0.210	410	ERG1AM331F11---T
	470	8×11	0.130	555	ERG1AM471F11---T
	560	8×16	0.120	675	ERG1AM561F16---T
	680	8×16	0.090	730	ERG1AM681F16---T
	820	8×20	0.085	875	ERG1AM821F20---T
	1,000	10×16	0.068	1,050	ERG1AM102G16---T
	1,200	10×20	0.052	1,220	ERG1AM122G20---T
	1,500	10×20	0.045	1,440	ERG1AM152G20---T
	2,200	12.5×20	0.038	1,660	ERG1AM222W20---T
	2,700	12.5×25	0.034	1,945	ERG1AM272W25---T
	3,300	12.5×25	0.030	1,950	ERG1AM332W25---T
	3,900	12.5×30	0.025	2,310	ERG1AM392W30---T
	4,700	12.5×35	0.022	2,510	ERG1AM472W35---T
	5,600	12.5×40	0.017	2,870	ERG1AM562W40---T
	6,800	16×30	0.019	3,010	ERG1AM682L30---T
	8,200	16×35	0.017	3,150	ERG1AM822L35---T
	10,000	16×40	0.015	3,710	ERG1AM103L40---T
16	47	5×11	0.800	120	ERG1CM470D11---T
	68	6.3×11	0.560	220	ERG1CM680E11---T
	100	6.3×11	0.520	255	ERG1CM101E11---T
	150	8×11	0.210	350	ERG1CM151F11---T

RG series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
16	220	8×11	0.200	405	ERG1CM221F11---T
	330	8×11	0.130	555	ERG1CM331F11---T
	470	8×16	0.090	730	ERG1CM471F16---T
	560	8×20	0.085	810	ERG1CM561F20---T
	680	8×20	0.069	1,050	ERG1CM681F20---T
	820	10×20	0.058	1,220	ERG1CM821G20---T
	1,000	10×20	0.052	1,220	ERG1CM102G20---T
	1,200	10×25	0.045	1,440	ERG1CM122G25---T
	1,500	12.5×20	0.038	1,660	ERG1CM152W20---T
	2,200	12.5×25	0.030	1,950	ERG1CM222W25---T
	2,700	12.5×30	0.025	2,310	ERG1CM272W30---T
	3,300	12.5×35	0.022	2,510	ERG1CM332W35---T
	3,900	12.5×40	0.017	2,870	ERG1CM392W40---T
	4,700	16×30	0.019	3,010	ERG1CM472L30---T
	5,600	16×35	0.017	3,150	ERG1CM562L35---T
	6,800	16×40	0.015	3,710	ERG1CM682L40---T
25	47	5×11	0.580	175	ERG1EM470D11---T
	68	6.3×11	0.360	230	ERG1EM680E11---T
	100	6.3×11	0.350	290	ERG1EM101E11---T
	150	8×11	0.200	405	ERG1EM151F11---T
	220	8×12	0.190	555	ERG1EM221F12---T
	330	8×16	0.120	730	ERG1EM331F16---T
	470	10×16	0.080	1,050	ERG1EM471G16---T
	560	10×20	0.058	1,220	ERG1EM561G20---T
	680	10×20	0.052	1,220	ERG1EM681G20---T
	820	10×25	0.045	1,440	ERG1EM821G25---T
	1,000	12.5×20	0.038	1,660	ERG1EM102W20---T
	1,200	12.5×25	0.034	1,936	ERG1EM122W25---T
	1,500	12.5×25	0.030	1,950	ERG1EM152W25---T
	2,200	12.5×35	0.022	2,510	ERG1EM222W35---T
	2,700	12.5×40	0.017	2,870	ERG1EM272W40---T
	3,300	16×30	0.019	3,010	ERG1EM332L30---T
	3,900	16×35	0.017	3,150	ERG1EM392L35---T
	4,700	16×40	0.015	3,710	ERG1EM472L40---T
35	10	5×11	1.500	100	ERG1VM100D11---T
	22	5×11	0.750	160	ERG1VM220D11---T
	33	5×11	0.580	210	ERG1VM330D11---T
	47	6.3×11	0.490	215	ERG1VM470E11---T
	68	8×11	0.210	350	ERG1VM680F11---T
	100	8×11	0.200	405	ERG1VM101F11---T
	150	8×12	0.130	555	ERG1VM151F12---T
	220	8×16	0.090	730	ERG1VM221F16---T

Radial Type

RG series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
35	330	10×16	0.080	1,050	ERG1VM331G16---T
	470	10×20	0.065	1,220	ERG1VM471G20---T
	560	10×25	0.045	1,440	ERG1VM561G25---T
	680	10×30	0.037	1,690	ERG1VM681G30---T
	820	12.5×25	0.035	1,938	ERG1VM821W25---T
	1,000	12.5×25	0.030	1,950	ERG1VM102W25---T
	1,200	12.5×30	0.025	2,310	ERG1VM122W30---T
	1,500	12.5×35	0.022	2,510	ERG1VM152W35---T
	2,200	16×30	0.019	3,010	ERG1VM222L30---T
	2,700	16×35	0.017	3,150	ERG1VM272L35---T
	3,300	16×40	0.015	3,710	ERG1VM332L40---T
	3,900	18×40	0.015	3,800	ERG1VM392M40---T
50	10	5×11	2.000	105	ERG1HM100D11---T
	22	5×11	1.100	155	ERG1HM220D11---T
	33	6.3×11	0.480	215	ERG1HM330E11---T
	47	6.3×11	0.400	220	ERG1HM470E11---T
	68	8×11	0.350	355	ERG1HM680F11---T
	100	8×12	0.230	485	ERG1HM101F12---T
	150	8×16	0.160	635	ERG1HM151F16---T
	220	10×16	0.088	1,050	ERG1HM221G16---T
	330	10×25	0.073	1,250	ERG1HM331G25---T
	470	12.5×20	0.059	1,480	ERG1HM471W20---T
	560	12.5×25	0.044	1,840	ERG1HM561W25---T
	680	12.5×30	0.039	2,220	ERG1HM681W30---T
	820	12.5×35	0.033	2,290	ERG1HM821W35---T
	1,000	16×25	0.034	2,240	ERG1HM102L25---T
	1,200	16×30	0.028	2,700	ERG1HM122L30---T
	1,500	16×35	0.025	2,800	ERG1HM152L35---T
	2,200	18×35	0.023	3,100	ERG1HM222M35---T
	2,700	18×40	0.020	3,400	ERG1HM272M40---T
63	12	5×11	1.900	145	ERG1JM120D11---T
	22	6.3×11	1.000	240	ERG1JM220E11---T
	39	6.3×14	0.610	330	ERG1JM390E14---T
	68	8×12	0.340	405	ERG1JM680F12---T
	100	8×16	0.270	535	ERG1JM101F16---T
	100	10×13	0.255	540	ERG1JM101G13---T
	120	10×16	0.190	600	ERG1JM121G16---T
	150	8×20	0.210	690	ERG1JM151F20---T
	180	10×20	0.145	890	ERG1JM181G20---T
	220	10×25	0.130	1,050	ERG1JM221G25---T
	330	10×30	0.090	1,300	ERG1JM331G30---T
	330	12.5×20	0.085	1,290	ERG1JM331W20---T

RG series

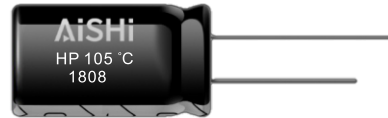
STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Imdepance (Ωmax/20°C,100kHz)	Rated Ripple Current (mArms/105°C,100kHz)	Part Number
63	390	12.5×25	0.070	1720	ERG1JM391W25---T
	470	12.5×30	0.055	2,090	ERG1JM471W30---T
	470	16×20	0.059	1,770	ERG1JM471L20---T
	680	12.5×35	0.047	2,270	ERG1JM681W35---T
	680	16×25	0.050	2,160	ERG1JM681L25---T
	680	18×20	0.055	2,290	ERG1JM681M20---T
	820	12.5×40	0.042	2,560	ERG1JM821W40---T
	820	16×30	0.043	2,670	ERG1JM821L30---T
	820	18×25	0.043	2,590	ERG1JM821M25---T
	1,000	16×35	0.036	2,770	ERG1JM102L35---T
	1,200	16×40	0.030	2,850	ERG1JM122L40---T
	1,200	18×30	0.032	2,950	ERG1JM122M30---T
	1,500	18×35	0.030	3,100	ERG1JM152M35---T
	1,800	18×40	0.025	3,210	ERG1JM182M40---T
100	10	6.3×11	3.680	110	ERG1KM100E11---T
	22	6.3×12	3.500	180	ERG1KM220E12---T
	47	10×13	1.500	395	ERG1KM470G13---T
	100	10×16	1.250	550	ERG1KM101G16---T
	220	12.5×25	0.650	900	ERG1KM221W25---T
	330	16×25	0.400	1,360	ERG1KM331L25---T
	470	16×30	0.290	1,650	ERG1KM471L30---T
	680	18×35	0.280	2,350	ERG1KM681M35---T

※Specifications subject to change without notice

HP series

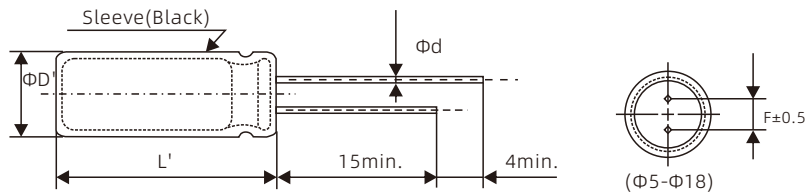
- Endurance: 1,000 hours at 105°C
- Standard bi-polarized series
- RoHS Compliant



SPECIFICATIONS

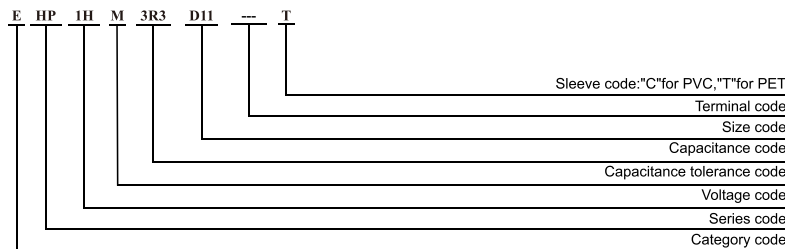
Items	Characteristics										
Category Temperature Range	-40~+105°C										
Rated Working Voltage Range	6.3~100 Vdc										
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)										
Leakage Current	I ≤ 0.06CVor 10μA, whichever is greater.(at 20°C after 2 minutes) I ≤ 0.03CVor 3μA, whichever is greater.(at 20°C after 5 minutes) Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V)										
Dissipation Factor (tanδ)	Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	80	100	
	tanδ (max.)	0.24	0.24	0.20	0.20	0.16	0.14	0.12	0.12	0.10	
	When nominal capacitance e×ceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase.										
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	80	100	(at 120Hz)
	Z(-25°C)/Z(+20°C)	4	3	2							
	Z(-40°C)/Z(+20°C)	10	8	6	4	3					
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hours at 105°C with the polarity inverted every 250 hours.										
	Capacitance Change	≤±20% of the initial value									
	Dissipation Factor	≤150% of the initial specified value									
	Leakage Current	≤The initial specified value									
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied.										
	Capacitance Change	≤±20% of the initial value									
	Dissipation Factor	≤150% of the initial specified value									
	Leakage Current	≤200% of the initial specified value									

DIMENSIONS [mm]



ΦD	5	6.3	8	10	12.5	18
Φd	0.5	0.5	0.5	0.6	0.6	0.8
F	2.0	2.5	3.5	3.5	5.0	7.5
ΦD'	ΦD+0.5MAX.					
L'	L+2MAX.					

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap. (μF)	Freq. (Hz)			
	50	120	1k	10k
Cap.≤47	0.75	1.00	1.57	2.00
100≤Cap.≤470	0.80	1.00	1.34	1.50
Cap.≥1,000	0.85	1.00	1.13	1.15

HP series

STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
6.3	33	5×11	45	EHP0JM330D11---T
	47	5×11	54	EHP0JM470D11---T
	100	6.3×11	90	EHP0JM101E11---T
	220	8×11	150	EHP0JM221F11---T
	330	8×11	185	EHP0JM331F11---T
	470	10×13	260	EHP0JM471G13---T
	1,000	10×20	460	EHP0JM102G20---T
	2,200	12.5×25	820	EHP0JM222W25---T
	3,300	16×25	1,110	EHP0JM332L25---T
	4,700	16×30	1,430	EHP0JM472L30---T
10	6,800	18×35	1,830	EHP0JM682M35---T
	22	5×11	37	EHP1AM220D11---T
	33	5×11	45	EHP1AM330D11---T
	47	5×11	54	EHP1AM470D11---T
	100	6.3×11	90	EHP1AM101E11---T
	220	8×11	150	EHP1AM221F11---T
	330	10×16	240	EHP1AM331G16---T
	470	10×16	290	EHP1AM471G16---T
	1,000	12.5×20	510	EHP1AM102W20---T
	2,200	16×25	910	EHP1AM222L25---T
16	3,300	16×30	1,200	EHP1AM332L30---T
	4,700	18×35	1,520	EHP1AM472M35---T
	10	5×11	27	EHP1CM100D11---T
	22	5×11	40	EHP1CM220D11---T
	33	5×11	49	EHP1CM330D11---T
	47	6.3×11	67	EHP1CM470E11---T
	100	8×11	110	EHP1CM101F11---T
	220	10×13	195	EHP1CM221G13---T
	330	10×16	265	EHP1CM331G16---T
	470	10×20	345	EHP1CM471G20---T
25	1,000	12.5×25	605	EHP1CM102W25---T
	2,200	16×30	1,070	EHP1CM222L30---T
	3,300	18×35	1,400	EHP1CM332M35---T
	10	5×11	27	EHP1EM100D11---T
	22	5×11	46	EHP1EM220D11---T
	33	6.3×11	56	EHP1EM330E11---T
	47	6.3×11	67	EHP1EM470E11---T
	100	8×11	110	EHP1EM101F11---T
	220	10×16	215	EHP1EM221G16---T
	330	12.5×20	320	EHP1EM331W20---T
35	470	12.5×20	380	EHP1EM471W20---T
	1,000	16×25	670	EHP1EM102L25---T
	2,200	18×35	1,140	EHP1EM222M35---T
	10	5×11	30	EHP1VM100D11---T
	22	6.3×11	51	EHP1VM220E11---T
	33	8×11	72	EHP1VM330F11---T
	47	8×11	86	EHP1VM470F11---T
	100	10×16	160	EHP1VM101G16---T
	220	12.5×20	290	EHP1VM221W20---T
	330	12.5×20	350	EHP1VM331W20---T
35	470	12.5×25	465	EHP1VM471W25---T
	1,000	16×30	805	EHP1VM102L30---T

WV (Vdc)	Cap (μF)	Size ΦD×L(mm)	Rated Ripple Current (mA rms/105°C, 120Hz)	Part Number
50	0.47	5×11	7	EHP1HMR47D11---T
	1	5×11	10	EHP1HM010D11---T
	2.2	5×11	15	EHP1HM2R2D11---T
	3.3	5×11	18	EHP1HM3R3D11---T
	4.7	5×11	22	EHP1HM4R7D11---T
	10	6.3×11	37	EHP1HM100E11---T
	22	8×11	63	EHP1HM220F11---T
	33	8×11	77	EHP1HM330F11---T
	47	10×13	105	EHP1HM470G13---T
	100	10×20	190	EHP1HM101G20---T
63	220	12.5×25	340	EHP1HM221W25---T
	330	16×25	460	EHP1HM331L25---T
	470	16×30	590	EHP1HM471L30---T
	3.3	5×11	20	EHP1JM3R3D11---T
	4.7	6.3×11	24	EHP1JM4R7E11---T
	10	6.3×11	40	EHP1JM100E11---T
	22	8×11	68	EHP1JM220F11---T
	33	10×13	98	EHP1JM330G13---T
	47	10×16	130	EHP1JM470G16---T
	100	12.5×20	225	EHP1JM101W20---T
80	220	16×25	405	EHP1JM221L25---T
	330	16×30	535	EHP1JM331L30---T
	470	18×35	680	EHP1JM471M35---T
	2.2	5×11	16	EHP1BM2R2D11---T
	3.3	6.3×11	23	EHP1BM3R3E11---T
	4.7	6.3×11	27	EHP1BM4R7E11---T
	10	8×11	46	EHP1BM100F11---T
	22	10×16	89	EHP1BM220G16---T
	33	10×16	105	EHP1BM330G16---T
	47	10×20	140	EHP1BM470G20---T
100	100	12.5×25	245	EHP1BM101W25---T
	220	16×30	435	EHP1BM221L30---T
	330	18×35	570	EHP1BM331M35---T
	0.47	5×11	8	EHP1KMR47D11---T
	1	5×11	12	EHP1KM010D11---T
	2.2	6.3×11	20	EHP1KM2R2E11---T
	3.3	6.3×11	25	EHP1KM3R3E11---T
	4.7	6.3×11	30	EHP1KM4R7E11---T
	10	8×11	50	EHP1KM100F11---T
	22	10×16	97	EHP1KM220G16---T
100	33	12.5×20	140	EHP1KM330W20---T
	47	12.5×20	170	EHP1KM470W20---T
	100	16×25	300	EHP1KM101L25---T
	220	18×35	510	EHP1KM221M35---T

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