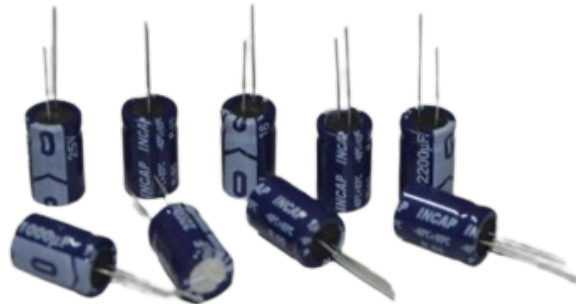


2026



INCAP LIMITED

PRODUCT CATALOGUE



ALUMINIUM ELECTROLYTIC CAPACITORS

WWW.INCAPLIMITED.COM

2026

PRODUCT GUIDE:

1. Series chart
2. Aluminum Electrolytic Capacitor Series table
3. Aluminum Electrolytic Capacitor Flow Chart
4. Application Guidelines for Aluminum Electrolytic Capacitors
5. Application Guidelines for Conductive polymer Solid Electrolytic Capacitors
6. Part Numbering System
7. Size table and figure

Aluminium Electrolytic Capacitor

PRODUCT SPECIFICATIONS:

Aluminium Electrolytic Capacitors:

1. Radial
2. SMD (PET Sleeve)
3. SMD
4. Snap-in
5. Screw –Terminal

Conductive Polymer Aluminium Solid Electrolytic Capacitors:

1. Radial
2. SMD
3. Low Leakage Current

Aluminium Electrolytic Capacitor

Series Chart:

Radial:

IT +105°C General purose 2000Hrs	IT5 105°C LOW ESR LOW LEAKAGE CURRENT 5000Hrs	IT8 +105°C LOW ESR LOW LEAKAGE CURRENT LED DRIVES 8000Hrs	IT10 +105°C LOW ESR LOW LEAKAGE CURRENT LED DRIVES 10000Hrs
IT115 +115°C High Ripple High Temperature Long Life 4000 ~ 5000Hrs	IT130 +130°C High Ripple High Temperature Long Life for LED DRIVES 2000 ~ 4000Hrs	NP +105°C NON-POLAR 2000Hrs	

Product specifications in this catalog are subject to change without notice. Request our product specifications before purchase and/or use. Please use our products based on the information contained in this catalog and product specifications.

Aluminium Electrolytic Capacitor

Series Chart:

SMD (PET SLEEVE):

ISMD10
+105°C High Ripple High Temperature Long Life for LED 8000 ~ 10000Hrs

ISMD130
+130°C High Ripple High Temperature Long Life for LED 2000 ~ 4000Hrs

SMD :

ISMD
+105°C General Purpose 2000Hrs

ISMD5
+105°C Long Life 5000Hrs

ISMD10
+105°C Long Life 7000Hrs

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Aluminium Electrolytic Capacitor

Series Chart:

Snap-in:

IS2	ISE2	IS5	IS7
+105°C General purpose 2000Hrs	+105°C LOW ESR LOW LEAKAGE CURRENT 2000Hrs	+105°C LOW ESR LOW LEAKAGE CURRENT 5000Hrs	+105°C LOW ESR LOW LEAKAGE CURRENT LED DRIVES 7000Hrs

Screw -Terminal:

ICST	ICST2
+85°C General purpose 2000Hrs	+105°C LOW ESR LOW LEAKAGE CURRENT 2000Hrs

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Conductive Polymer Aluminium Solid ncap Electrolytic Capacitors:

Series Chart:

Radial:

IPS
+105°C General purpose 2000Hrs

2000Hrs Long Life +102°C
IbT

IPH
+125°C Long Life 2000Hrs

SMD:

Radial:

IPD
+105°C General Purpose SMD Polymeric 2000Hrs

IPE
+105°C LOW ESR LOW LEAKAGE CURRENT 5000Hrs

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Aluminum Electrolytic Capacitor

Series table:

RADIAL:

Series	COD E	Features	Endurance (hours)	Temp°C Range	Rated Voltage(Vdc)	Capacitance Range (μF)	Page
IT	IT	General Purpose	105°C 2,000	-40°C~+105°C	10~100V	1~10,000	38-39
IT5	IT5	Low ESR ,Low Leakage Current	105°C 5,000	-40°C~+105°C	10~100V	1~10,000	40-42
IT8	IT8	Low ESR ,Low Leakage Current, LED Drives	105°C 8,000	-40°C~+105°C	10~100V	1~10,000	43-45
IT10	IT10	Low ESR ,Low Leakage Current, LED Drives	105°C 10,000	-40°C~+105°C	10~100V	1~10,000	46-50
IT115	IT115	High Ripple, High Temperature, Long Life	115°C 4,000~5,000	-40°C~+105°C	10~500V	0.47~2,200	51-55
IT130	IT130	High Ripple, High Temperature, Long Life for LED	115°C 2,000~4,000	-40°C~+130°C	10~500V	1~2,200	56-60
NP	NP	Non-Polar	105°C 2,000	-40°C~+105°C	10~250V	1~2,200	61-62

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Aluminum Electrolytic Capacitor

Series table:

SMD (PET SLEEVE):

Series	CODE	Features	Endurance (hours)	Temp°C Range	Rated Voltage(Vdc)	Capacitance Range (μF)	Page
ISMD10	ISMD10	High Ripple, High Temperature, Long Life for LED	105°C 8,000~10,000	- 40°C~+105°C	6.3~500V	0.47~2,200	63-64
ISMD130	ISMD130	High Ripple, High Temperature, Long Life for LED	130°C 2,000~4,000	- 40°C~+130°C	6.3~500V	1~2,200	65-66

SMD :

Series	CODE	Features	Endurance (hours)	Temp°C Range	Rated Voltage(Vdc)	Capacitance Range (μF)	Page
ISMD	ISMD	General Purpose	105°C 2,000	- 40°C~+105°C	6.3~100V	1~1,000	67-68
ISMD5	ISMD5	Long Life	105°C 5,000	- 40°C~+105°C	6.3~450V	1~1,000	69-70
ISMD10	ISMD10	Long Life	105°C 7,000	- 40°C~+105°C	6.3~450V	1~1,000	71-72

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Aluminum Electrolytic Capacitor

Series table:

SNAP-IN

Series	CODE	Features	Endurance (hours)	Temp°C Range	Rated Voltage(Vdc)	Capacitance Range (μF)	Page
IS2	IS2	General Purpose	105°C 2,000	- 25°C~+105°C	16~500V	47~1,00,000	73-75
ISE2	ISE2	Low ESR ,Low Leakage Current	105°C 2,000	- 25°C~+105°C	16~500V	47~1,00,000	76-80
IS5	IS5	Low ESR ,Low Leakage Current	105°C 5,000	- 25°C~+105°C	16~500V	47~1,00,000	81-84
IS7	IS7	Low ESR ,Low Leakage Current, LED Drives	105°C 7,000	- 55°C~+105°C	16~500V	47~1,00,000	85-87

Screw-Terminal :

Series	CODE	Features	Endurance (hours)	Temp°C Range	Rated Voltage(Vdc)	Capacitance Range (μF)	Page
ICST	ICST	General Purpose	85°C 2,000	-40°C~+85°C	16~500V	47~1,00,000	88-91
ICST2	ICST2	Low ESR ,Low Leakage Current	105°C 2,000	- 40°C~+105°C	16~500V	47~1,00,000	92-94

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Conductive Polymer Aluminium Solid ncap Electrolytic Capacitors:

Series table:

RADIAL:

Series	CODE	Features	Endurance (hours)	Temp°C Range	Rated Voltage(Vdc)	Capacitance Range (µF)	Page
IPS	IPS	General Purpose	105°C 2,000	-55°C~+105°C	2.5~100V	6.8~3,300	26-29
IPL	IPL	Long Life	105°C 5,000	-55°C~+105°C	2.5~100V	6.8~3,300	30-31
IPH	IPH	High Temperature	125°C 2,000	-55°C~+125°C	6.3~100V	22~1,000	32-33

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Conductive Polymer Aluminium Solid ncap Electrolytic Capacitors:

Series table:

SMD

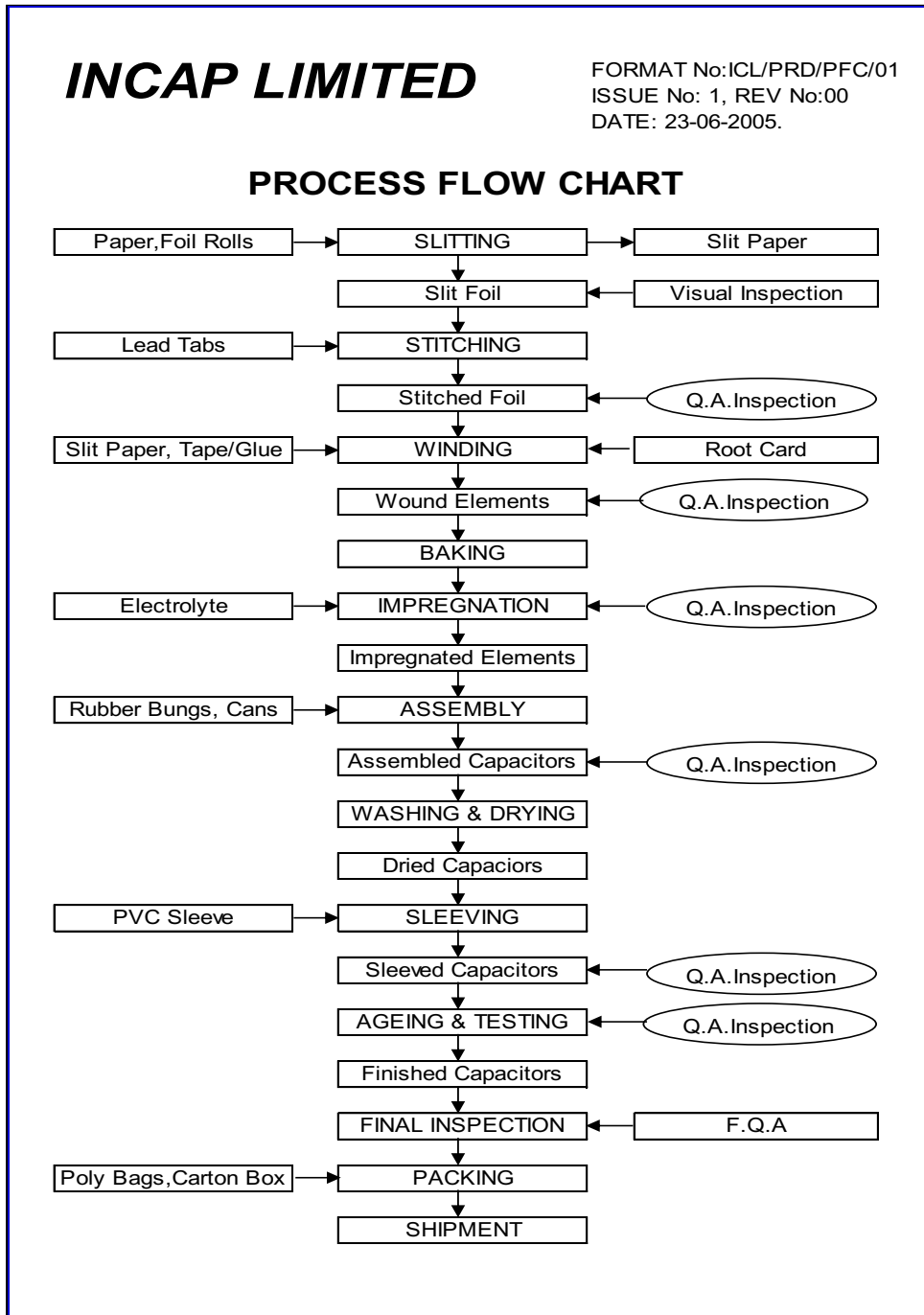
Series	CODE	Features	Endurance (hours)	Temp°C Range	Rated Voltage(Vdc)	Capacitance Range (μF)	Page
IPD	IPD	General Purpose ,SMD Polymeric	105°C 2,000	- 55°C~+105°C	2.5~100V	6.8~3,300	34-35

Low Leakage Current

Series	CODE	Features	Endurance (hours)	Temp°C Range	Rated Voltage(Vdc)	Capacitance Range (μF)	Page
IPE	IPE	Low Leakage Current	105°C 5000	-55°C~+105°C	10~63V	6.8~3,300	36-37

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Conductive Polymer Aluminium Solid **incap** Electrolytic Capacitors:



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Conductive Polymer Aluminium Solid Incap Electrolytic Capacitors:

Quality Certifications:

APTS Quality Certifications
Certificate of Registration

The APTS Quality Certifications hereby certifies that:

INCAP LIMITED
1-58, NIDAMANURU, VIJAYAWADA-521 104, A.P, INDIA

has been found to conform to the Quality Management System Standard:

ISO 9001:2015
with a scope of:
Design, Development, Manufacturing, Testing and Delivery
of Aluminium Electrolytic Capacitors.
Capacitance Range: 0.1 MFD to 100000 MFD, Voltage Range: 6.3 VDC to 500 VD.

This certificate is being issued in accordance with ISO 17021:2011 as required by conformity assessment bodies. APTS Quality Certifications is accredited by Standards Accreditation Council for Assessment Services Providers (SACASP), an independent accreditation body complying to ISO 17011: 2016 .The validity of the certificate is subjected to periodic surveillance audits and on complete review, every three years of the management system. The validity of the certificate can be obtained by verifying in the website www.sacasp.org.

Certificate Number : APTS QMS 361
Date of Initial Registration : 03/04/2018
Registration Validity : 02/04/2027
Recertification Date : 02/04/2027

Controller of Certification
APTS Quality Certifications
www.aptsquality.com

APTS
Assessment Process Transforms Systems

SACASP
ACCREDITATION
Standards Accreditation Council for
Assessment Services Providers

ODC Standards Certifications
Certificate of Registration

The ODC Standards Certifications hereby certifies that:

M/s INCAP LIMITED
1-58, NIDAMANURU, VIJAYAWADA-521 104, A.P, INDIA

has been found to conform to the Environment Management System

ISO 14001:2015
with a scope of:
Design, Development, Manufacturing, Testing and Delivery
of Aluminium Electrolytic Capacitors.
Capacitance Range: 0.1 MFD to 100000 MFD, Voltage Range: 6.3 VDC to 500 VD.

"Further clarifications regarding the scope of the certificate and the applicability of the standard requirements may be obtained by consulting the organisation." "This is an accredited certificate sanctioned for issue by STANDARDS ACCREDITATION COUNCIL FOR ASSESSMENT SERVICES PROVIDERS (SACASP) in accordance with the requirements of ISO/IEC 17021: 2016. The validity of this certificate can be verified by checking the Directory of Certified Organizations maintained at the SACASP website www.sacasp.org."

Certificate Number : 08191400101
Date of Initial Registration : 02/08/2019
Registration Validity : 01/08/2026
Recertification Date : 01/08/2028

Controller of Certification
ODC Standards Certifications
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Application Guidelines for Aluminum Electrolytic Capacitors:

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Application Guidelines for Aluminum Electrolytic Capacitors:

- A. **Circuit Design:**
- B. Please make sure the application and mounting conditions to which the capacitor will be exposed to are within the conditions specified in catalog or alternate product specification (Referred to as specification here after). If it is used under the rated performance, the capacitor may be damaged,
- C. Smoke and fire may occur) .
- D. Operating temperature and applied ripple current shall be within the specification.
- E. ①The capacitor shall not be used in an ambient temperature which exceeds the operating temperature specified in the specification.
- F. ②Do not apply excessive current which exceeds the allowable ripple current. ③Appropriate capacitors which comply with the life requirement of the products should be selected when designing the circuit.
- G. Aluminum electrolytic capacitors are polarized. Make sure that no reverse Voltage or AC voltage is applied to the capacitors. Please use bi-polar Capacitors for a circuit that can possibly see reversed polarity. Note: Even bi-polar capacitors cannot be used for AC voltage application.
- H. For a circuit that repeats rapid charging/discharging of electricity, an appropriate- ate capacitor that is capable if enduring such a condition must be used. Welding machines and photo flash are a few examples of products that contain such a circuit voltage fluctuates substantially.
- I. For appropriate choice of capacitors for circuit that repeat rapid charging/ discharging, please consult INCAP LIMITED.
- J. Make sure that no excess voltage (that is, higher than the rated voltage) is applied to the capacitor.
- K. ①Please pay attention so that the peak voltage, which is DC voltage overlapped by ripple current, will not exceed the rated voltage.
- L. ②In the case where more than 2 aluminum electrolytic capacitors are used in series, please make sure that applied voltage will be lower than rated voltage and the voltage be will applied to each capacitor equally using a balancing resistor in parallel with the capacitors.
- M. Aluminum electrolytic capacitors must be electrically isolated as follows: The aluminum case and the cathode foil are connected by the unstable resistance of a naturally formed oxide layer inside the aluminum case and the electrolyte.
- N. ①Case and negative terminal, Case and positive terminal, Case and circuit Pattern.
- O. ②Auxiliary terminal of can type and negative and positive terminal, including the circuit pattern.
- P. ③Case and both terminals of a bi-polarized capacitor.
- Q. Capacitors may fail if they are used under the following conditions:
- R. ①Environmental (climatic) conditions
- a. Being exposed to water, high temperature & high humidity atmosphere, or condensation of moisture.
 - b. Being exposed to oil or an atmosphere that is filled with particles of oil.
- S. (C) Being exposed to salty water or an atmosphere that is filled with particles of salt.
- T. In an atmosphere filled with toxic gasses (such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine, methyl bromide, ammonia, etc.).
- U. Being exposed to direct sunlight, ozone, ultraviolet ray, or radiation. (f) Being exposed to acidic or alkaline solutions.
- V. ②Under severe conditions where vibration and/or mechanical shock exceed the applicable ranges of the specifications.
- W. When designing a P.C. board, please pay attention to the following:
- X. ①Have the hole spacing on the P.C. board match the lead spacing of the capacitor.
- Y. ②There should not be any circuit pattern or circuit wire above the capacitor pressure relief vent.
- Z. ③Unless otherwise specified, following clearance should be made above the pressure relief vent.
- | | |
|-----------------------|-------------|
| Case Diameter | |
| Clearance required | |
| Φ 6.3 to 16mm | 2mm or more |
| Φ 18 to 35mm | 3mm or more |
| Φ 40mm or more | 5mm or more |
- AA. ④In case the vent side is placed toward P.C. board (such as end seal vented parts), make a corresponding hole
- BB. On the P. C. board to release the gas when vent is operated. The hole should be made to match the capacitor vent position.

- A. ⑤When installing, do not face down the sealing part of threaded terminal type. Do not place the pressure valve and anode terminal downward when it is placed horizontally.
 - B. If there is a circuit pattern under the sealing part of the capacitor, once the electrolyte leaks, it may cause a short circuit of the circuit pattern, resulting in smoke and fire caused by leakage trace or electric migration. Therefore, do not configure the circuit pattern under the sealing part of the capacitor.
 - C. Do not design a circuit board so that heat generating components are placed near an aluminum electrolytic capacitor or reverse side of P.C. board (under the capacitor).
 - D. Please refer to the pad size layout recommendations in our catalog when designing in surface mount capacitors.
 - E. Electrical characteristics may vary depending on changes in temperature and frequency. Please consider this variation when you design circuits.
 - F. When you mount capacitors on the double-sided P.C. boards, do not place capacitors on circuit patterns or over on unused holes.
 - G. The torque for terminal screw or brackets screws shall be within the specified value on INCAP's drawings.
 - H. When you install more than 2 capacitors in parallel, consider the balance of current flowing through the capacitors. Especially, when a solid conductive polymer aluminum electrolytic capacitor and a standard aluminum electrolytic capacitor are connected in parallel, special consideration must be given.
 - I. If more than 2 aluminum electrolytic capacitors are used in series, make sure the applied voltage will be lower than the rated voltage and that voltage will be applied to each capacitor equally using a balancing resistor in parallel with each.
- J. Mounting**
- K. Once a capacitor has been assembled in the set and power applied, even if a capacitor is discharged, an electric potential (re striking voltage) may exist between the terminals.
 - L. Electric potential between positive and negative terminal may exist as a result of returned electromotive force, so please discharge the capacitor using a $1k\Omega$ resistor.
 - M. Leakage current of the parts that have been stored for more than 2 years may increase. If leakage current has increased, please perform a voltage treatment using $1k\Omega$ resistor.
 - N. Please confirm ratings before installing capacitors on the P.C. board.
 - O. Please confirm polarity before installing capacitors on the P.C. board.
 - P. Do not drop capacitors on the floor, nor use a capacitor that was dropped.
 - Q. Do not damage the capacitor while installing.
 - R. Please confirm that the lead spacing of the capacitor matches the holes spacing of the P.C. board prior to installation.
 - S. Snap-in can type capacitor such as JIS style symbol 692, 693, 694 and 695 type should be installed tightly to the P.C. board (allow no gap between the P.C. board and bottom of the capacitor).
 - T. Please pay attention that the clinch force is not too strong when capacitors are placed and fixed by an automatic insertion machine.
 - U. Please pay attention to that the mechanical shock to the capacitor by suction nozzle of the automatic insertion machine or automatic mouter, or by product checker, or by centering mechanism.
 - V. Hand soldering.
 - W. ①Soldering condition shall be confirmed to be within the specification.
 - X. ②If it is necessary that the leads must be formed due to a mismatch of the lead space to hole space on the board, bend the lead prior to soldering without applying too much stress to the capacitor.
 - Y. ③If you need to remove parts which were soldered, please melt the solder enough so that stress is not applied to lead.
 - Z. ④Please pay attention so that solder iron does not touch any portion of capacitor body.
 - AA. Flow soldering (Wave solder)
 - BB. ①Aluminum capacitor body must not be submerged into the solder bath. Aluminum capacitors must be mounted on the "top side" of the P.C. board and only allow the bottom side of the P.C. board to come in contact with the solder.
 - CC. ②Soldering condition must be confirmed to be within INCAP specification. Solder temperature: $260 \pm 5^{\circ}\text{C}$ Immersing lead time: 10 ± 1 second, Thickness of P.C. board: 1.6mm.
 - DD. ③Please avoid having flux adhere to any portion except the terminal.
 - EE. ④Please avoid contact between other components and the aluminum capacitor.

- A. Reflow soldering(SMD only)
- B. ①Soldering condition must be confirmed to be within INCAP Specification.
- C. ②When an infrared heater is used, please pay attention to the extent of heating since the absorption rate of infrared, will vary due to difference in the color of the capacitor body, material of the sleeve and capacitor size.
- D. Soldering flux there are non-halogen types of flux that do not contain ionic halides, but contain many non-ionic halides. When there non-ionic halides infiltrate the capacitor, they cause a chemical reaction that is just as harmful as the use of cleaning agents. Use soldering flux that does not do not carry the P.C. board by grasping the soldered capacitor.
- E. Please do not allow anything to touch the capacitor after soldering. If P.C.board are stored in a stack, please make sure P.C. board or the other components do not touch the capacitor. The capacitors shall not be effected by any radiated heat from the soldered P.C. board or other components after soldering.
- F. Recommended Cleaning Condition Applicable: Any type, any ratings. Cleaning Agents
- G. Based Alcohol solvent cleaning agent Isopropyl Alcohol
- H. Based water solvent cleaning agent Cleaning Conditions :
- I. Total cleaning time shall be no greater than 5 minutes by immersion, ultrasonic or other method. (Temperature of the cleaning agent shall be 60°C maximum.) After the board cleaning has been completed, the capacitors should be dried using hot air for a minimum of 10 minutes. If the cleaning solution is infiltrated between the case and the sleeve, the sleeve might soften and swell when hot air temperature is too high. Therefore, hot air temperature should not exceed softening temperature (80°C) of the sleeve. Insufficient dries after water rinse may cause appearance problems, such as sleeve shrinking, bottom-plate bulging.
- J. In addition, a monitoring of the contamination of cleaning agents (electric conductivity, pH, specific gravity, water content, etc.) must be implemented.
- K. After the cleaning, do not keep the capacitors in an atmosphere containing the cleaning agent or in an air tight container. In addition regarding jet washing, please use caution since the sleeve may expand cause of the angle and
- L. /or the strength of the water jet. Depending on the cleaning method, the marking on a capacitor may be erased or burred.
- M. Consult INCAP LIMITED before using a cleaning method or a cleaning agent other than those recommended.
- N. Fixing Material and Coating Material
- O. ①Do not use any affixing or coating materials, which contain halide substance.
- P. ②Remove flux and any contamination, which remains in the gap between the end seal and PC board.
- Q. ③Please dry the cleaning agent on the PC board before using affixing or coating materials.
- R. ④Please do not apply any material all around the end seal when using affixing or coating materials.
- S. There are variations of cleaning agents, fixing and coating materials, so please contact those manufacture or our sales office to make sure that the material would not cause any problems.
- T. Others
- U. If the halogen contained in the fumigant invades the inside of the capacitor, it may react with the electrolyte, electrode foil, etc. (mainly part of the gas passes through the sealing part of the capacitor and invades the inside of the capacitor.)This chemical reaction will lead to the corrosion of the internal aluminum components, which may cause the bad leakage current, open circuit, pressure valve action and other faults of the capacitor. At the time of export or in the insect control strategy used by the machine, the halogen compounds such as methyl bromide are sometimes used for fumigation. When fumigating capacitors and machines equipped with capacitors, or using fumigated pallets as packaging materials, please take full care to avoid exposure of capacitors to halogen atmosphere.
- V. Contain non-ionic halides.
- W. Shrinkage, bulging and/or cracking could be seen on the outer sleeve of the capacitor when capacitors are kept in for more than 2 minutes at 150°C ambient temperature during soldering at reflow process or resin curing process. Applying high temperature gas or heat ray to capacitor can cause the same phenomenon.
- X. Do not tilt lay down or twist the capacitor body after the capacitor are soldered to the P.C. board.
- A. In the equipment**
- B. Do not directly touch terminal by hand.
- C. Do not short between terminals with conductor, nor spill conductible liquid such as alkaline or acidic solution on or near the capacitor.

- D. Please make sure that the ambient conditions where the set is installed not have any of the following conditions:
- E. ①Where capacitors are exposed to water, high temperature & high humidity atmosphere, or condensation of moisture.
- F. ②Where capacitors are exposed to oil or an atmosphere that is filled with particles of oil.
- G. ③Where capacitors are exposed to salty water, high temperature & high humidity atmosphere, or condensation of moisture.
- H. ④The atmosphere is filled with toxic acid gasses (e.g. hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine, methyl bromide, etc.)
- I. ⑤The atmosphere is filled with toxic alkaline gasses (e.g. ammonia)
- J. ⑥Where capacitors are exposed to acidic or alkaline solutions.
- K. ⑦Since shrinkage, bulging and/or crack could be seen on outer sleeve of capacitor when capacitors are used in atmosphere where condensation of moisture occurs, please confirm their adaptation before the use. The condensation of moisture could occur when temperature cycling test/ Rapid change of temperature test is performed, in this case, aforementioned sleeve problem could be seen.

L. Maintenance Inspection

- a. Please periodically inspect the aluminum capacitors that are installed in industrial equipment. The following items should be checked:

- M. ①Appearance: Remarkable abnormality such as vent operation, leaking electrolyte etc.
- N. ②Electrical characteristic: Capacitance, dielectric loss tangent, leakage current, and items specified in the specification.

O. In an Emergency

- P. If you see smoke due to operation of safety vent, turn off the main switch or pull out the plug from the outlet.
- Q. Do not bring your face near the capacitor when the pressure relief vent operates. The gasses emitted from that are over 100 °C. If the gas gets into your eyes, please flush your eyes immediately in pure water. If you breathe the gas, immediately wash out your mouth and throat with water.
- R. Do not ingest electrolyte. If your skin is exposed to electrolyte, please wash it away using soap and water.

S. Storage

- T. It is recommended to keep capacitors between the ambient temperatures of -5°C to 35°C and a relative humidity of ≤75% or below.
- U. Please make sure the ambient storage conditions will be free from the conditions that are listed in clause 3. "In the equipment" at (3). In order to maintain the satisfactory soldering condition for conductive polymer aluminum solid electrolytic capacitors, the following items must be strictly adhered to.
- V. Parts should be stored sealed in a bag until they are actually used.
- W. Once the sealed bag is cut open, all the parts should be used at one time. If not, then the remaining parts should be placed in a bag and sealed with tape.
- X. In order to maintain a good Solderability of the parts, shelf life of parts should not exceed 1 year.

Y. Disposal

- Z. Take either of the following methods in disposing of capacitors.
- AA. ①Make a hole in the capacitor body or crush capacitors and incinerate them.
- BB. ②If incineration is not applicable, hand them over to a waste disposal agent and have them buried in a landfill.

CC. When removing a capacitor from the circuit board or when disposing of capacitor please ensure that the capacitor is properly discharged.

ESR, Impedance Measuring Point:

Radial lead type ESR should be measured at both of the terminal ends closest to the capacitor body. Chip type ESR should be measured at both of the terminal ends closest where the terminals protrude through the plastic platform.

Application Guidelines for Polymer Aluminum Solid Electrolytic Capacitors:

- A. 1.Circuit Design:
- B. Please make sure the application and mounting conditions to which the capacitor will be exposed to be within the conditions specified in catalog or alternate product specification (Referred to as specification hereafter).
- C. Please select a suitable solid capacitor according to the capacitance characteristics specified in the specification. a) Do not use over voltage, even a short overvoltage may cause a short circuit of the solid capacitor; b) The capacitor shall not be used in an ambient temperature which exceeds the operating
- D. Temperature specified in the specification. c) Do not apply excessive current which exceeds the allowable ripple current.
- E. Appropriate capacitors which comply with the life requirement of the products should be selected when designing the circuit.
- F. Polar solid aluminum capacitors have positive and negative electrodes. Do not reverse the solid aluminum capacitors. Reverse solid aluminum capacitors can cause a sharp increase in leakage current or a decrease in Service life.
- G. Instantaneous charge and discharge may cause a short circuit in the solid aluminum capacitor or increase the leakage current, so design the protection circuit in the following situations: a) The inrush current is greater than 10A; b) The inrush current is greater than 10 times the allowable ripple current value. In addition, when testing the product leakage current, please set a 1k Ω protection resistor. (If excess a rush current due to drastic
- H. Charge / dis-charge was applied to conductive polymer aluminum solid electrolytic capacitors, it may cause a short circuit or an increase in leakage current. Therefore, please do not apply a rush current that is larger than 10A)
- I. Circuits that are forbidden to use: Even if the customer installs a solid aluminum capacitor in strict
- J. Accordance with the welding conditions we have given, the leakage current of the solid aluminum capacitor may increase or even increase significantly. High temperature no load test, high temperature and high humidity no load test, temperature rapid change test, etc. may lead to an increase in leakage current. Therefore, do not apply solid aluminum capacitors to circuits that are sensitive to leakage currents. Such as: a) high impedance circuit; b) a coupling circuit; c) Time constant circuit.
- K. Working voltage a) The sum of the DC voltage and the ripple peak voltage shall not exceed the rated
- L. operating voltage; b) When the DC voltage is relatively low, the reverse ripple peak voltage cannot exceed 10% of the rated operating voltage; c) For products above 25v, when the ambient temperature exceeds 85 $^{\circ}$ C, please use a solid aluminum capacitor for depressurization. For every 10 $^{\circ}$ C rise in temperature, the voltage applied to the product should be reduced by 10%. 2. Special reminder (1) Leakage current: The welding heat and the mechanical stress originating from the transportation can cause the leakage current of the capacitor to increase.
- M. However, applying a DC voltage not exceeding the rated working voltage to the product gradually reduces the leakage current, and does not exceed the rated working voltage and the working upper limit temperature. Under the premise, the higher the applied voltage and the higher the ambient temperature, the faster the leakage current decreases. (2) Capacitor insulation: The insulating coating or insulating hose layer outside the capacitor is not absolutely insulated, and the aluminum shell and the negative lead wire are not insulated. When installing, be sure to completely separate the aluminum casing, positive and negative guide pins and PC board prints. (3) Working environment restrictions: Do not use solid aluminum capacitors in the following environments: a) water, salt water, where oil can drip directly, and boards that are prone to shrinkage; b) where harmful gases (H₂S, sulfuric acid, nitric acid, ammonia, hydrochloric acid, etc.) are concentrated; c) In the case of ultraviolet radiation, radioactive rays, ozone, etc. (4) PCB board design a) Do not install solid capacitors around or above the heat source components; b) The mounting hole diameter and spacing on the PCB should.
- N.Parallel circuit: When the solid capacitor is connected in parallel with another (liquid) capacitor, since the solid capacitor has a much lower ESR value, a large ripple current may be applied to the solid capacitor. Be sure to carefully
- O. Select the specifications of the capacitor.
- P. The electrical performance of solid aluminum capacitors is affected by frequency fluctuations. This factor should be considered when designing the circuit.
- Q. When installing a solid aluminum capacitor on a double-sided PCB, do not install a solid aluminum capacitor at the perforation of
- R. The PCB before and after the connection.

- S. Preparation before installation
- T. Soldering: Please weld according to the welding conditions specified in SPEC.
- U. Otherwise, it may cause damage to the outer insulation layer, sharp increase of leakage current and decrease in capacity;
- V. Precautions before installation:
 - a. Please do not reuse the solid aluminum capacitor that has been installed and used;
 - b. When the storage time of the solid aluminum capacitor is long, the leakage current will increase. At this time, the capacitor can be subjected to a voltage
- W. Treatment. The recommended processing conditions are: 60~70°C rated voltage for 1 hour, and the capacitor is connected in series with 1kΩ protection resistor. .
- X. Installation:
 - a. carefully check the capacitor's capacity and operating voltage;
 - b. Please pay attention to the polarity of the capacitor;
 - c. Please be careful not to drop the solid aluminum capacitor on the ground, and do not use the dropped capacitor;
 - d. Do not deform the solid aluminum capacitor;
 - e. Before installation, please check whether the capacitor pin type matches the hole diameter and spacing on the PCB. When using the automatic inserter, please do not use too much insertion force;
 - f. Please pay attention to the vibration intensity generated by the automatic insertion and installation machine, product inspection
- Y. Equipment, etc.
 - a. Do not apply additional external force to the capacitor guide pins and the capacitor itself.
- Z. When soldering with a soldering iron:
 - a. Please set the welding conditions (temperature, time) according to the specifications of the capacitor;
 - b. When the type of the guide pin of the solid aluminum capacitor does not match the PCB board, when the guide pin has to be processed, please handle it before welding so as not to leave stress on the solid aluminum capacitor after soldering;
 - c. Do not apply additional stress to the solid aluminum capacitor when soldering;
 - d. When removing a poorly mounted solid aluminum capacitor from the board with an electric soldering iron, make sure that the soldering iron has completely melted the solder before removing the solid aluminum capacitor to avoid stress on the solid aluminum capacitor;
 - e. Do not touch the head of the soldering iron to a solid aluminum capacitor;
 - f. After welding, the leakage current of the solid aluminum capacitor may increase, and the leakage current will gradually decrease after the voltage is applied.
- AA. Wave soldering
 - a. Please do not submerge the solid aluminum capacitor in the solder. Please solder the opposite side of the solid aluminum capacitor on the PCB board;
 - b. Please set the welding conditions (temperature, time) according to the specifications of the capacitor;
 - c. After welding, the leakage current of the solid aluminum capacitor may increase, and the leakage current will gradually decrease after the voltage is applied;
 - d. Please be careful not to touch the solder in any part other than the guide pin;
 - e. When soldering, please note that other components on the board do not touch the solid aluminum capacitor or drop onto the solid aluminum capacitor;
 - f. When an extremely abnormal soldering process is used, it may cause the capacity of the solid aluminum capacitor to drop or damage
- BB. Other characteristics of the capacitor.
- CC. Reflow soldering (SMD only) Soldering condition must be confirmed to be within Huawei Specification.
- DD. Precautions after welding
- EE. When the solid aluminum capacitor is soldered, do not use external force to tilt, bend

(1) Please do not grab the solid aluminum capacitor to move the PCB board; (3) When stacking PCB boards with solid aluminum capacitors, do not touch or contact solid aluminum capacitors with other components;

(4) Do not allow external aluminum capacitors soldered on the PCB to withstand external forces.

(5) PCB board cleaning: Please choose ethanol cleaning agent, and pay attention to the following conditions:

- a) When using immersion method and ultrasonic cleaning, please do not exceed 2 minutes;
- b) the cleaning temperature must be lower than 60 ° C;
- c) Please pay attention to the pollution caused by cleaning agents;
- d) After cleaning, dry with hot air below the rated working temperature.

(6) Fixing Material and Coating Material

- a) Do not use any affixing or coating materials, which contain halide substance.
- b) Remove flux and any contamination, which remains in the gap between the end seal and PC board.
- c) Please dry the cleaning agent on the PC board before using affixing or coating materials.
- d) Please do not apply any material all around the end seal when using affixing or coating materials.

There are variations of cleaning agents, fixing and coating materials, so please contact those manufacture or our sales office to make sure that the material would not cause any problems.

(7) Other notes:

- a) Do not touch the lead wire of the solid aluminum capacitor directly with your hand;
- b) Do not use a conductor to connect the positive and negative poles of a solid aluminum capacitor. Do not allow the solid aluminum capacitor to contact a conductive solution (such as an aqueous solution of acid and helium);

3.Storage and disposal

(1) Do not store solid aluminum capacitors in a high temperature and high humidity environment, a good storage temperature of 5 ~ 35 ° C, humidity of 75% or less;

(2) In order to maintain good Solderability of solid aluminum capacitors, please do not open the factory packaging, and the storage period should not exceed 1 year;

(3) Open the package only before installation and install the entire product at one time. If there is any product remaining, please put it back in the bag and seal the bag.

(4) Do not store solid aluminum capacitors in a hazardous atmosphere.

4. Failure mode and life

(1) Accidental failure: mainly caused by short circuit of the circuit. When the current in the short circuit exceeds 1A, the internal temperature of the capacitor will rise, the internal pressure will increase, the sealing rubber will be raised or even opened, and the capacitor will release harmful gases. Please leave this occasion at this time

(2) Life failure: After long-term use, the characteristics of solid aluminum capacitors will be attenuated, such as capacity drop, ESR rise, etc. When the use time exceeds the rated life, the characteristics of the capacitor deteriorate, and electrolyte insulation may be caused. This is called open circuit failure mode.

5. Disposal

(1) Take either of the following methods in disposing of capacitors.

- a) Make a hole in the capacitor body or crush capacitors and incinerate them.
- b) If incineration is not applicable, hand them over to a waste disposal agent and have them buried in a landfill.

(2) When removing a capacitor from the circuit board or when disposing of capacitor please ensure that the capacitor is properly discharged.

ESR, Impedance Measuring Point Radial lead type ESR should be measured at both of the terminal ends closest to the capacitor body. Chip type ESR should be measured at both of the terminal ends closest where the terminals protrude through the plastic platform.

PART NUMBERING SYSTEM:

1. HOW TO ORDER

Category code

Series code

Voltage Code

Capacitance Code

Size code

Capacitance Tolerance Code

Terminal Code

Sleeve making code

a) Category Code: Refer Table of contents.

b) SERIES: Refer Table of contents.

c) VOLTAGE CODE:

Voltage in volts (V) is represented by a two digit code showing the real working voltage indicated as follows.

Voltage (V)	4	6.3	10	13	16	25	35	40	50	63	75	80	100	160	200	250	350	400	450	500
Code	0G	0J	1A	1B	1C	1E	1V	1G	1H	1J	1K	1L	2A	2C	2D	2E	2V	2G	2W	2X

d) CAPACITANCE CODE:

Rated capacitance in μF is represented by a three digit number .The first two digits are the significant figures of the nominal capacitance and the third digit indicates the number of zeros following these figures .The Decimal point is represented by the capital letter R.Please refer to the following example.

μF	0.1	0.47	1.0	4.7	10	47	100	470	1000	4700	10000
Part number	0R1	R47	010	4R7	100	470	101	471	102	472	103

e) SIZE CODE: EX:

4X7 - 11

5x11 - 12

10x16 -16

13x25 -20

16x36 -24

22x37 -28

6.3x11 - 13

10x20 -17

16x16 -21

18x32 -25

22x43 -29

8x11 -14

10x25 -18

16x25 -22

18x37 -26

25x25 -30

10x13 -15

13x21 -19

16x32 -23

18x43 -27

25x30 -31

25x40 -32	25x50 -33	25x60 -34	25x64 -35
30x35 -36	30x40 -37	30x50 -38	35x30 -39
35x35 -40	35x45 -41	35x52 -42	35x60 -43
35x63 -44	35x68 -45	40x40 -46	40x50 -47

f) CAPACITANCE TOLERANCE CODE:

Symbol of **W, T, Q, V, M, K** and **J** shows special capacitance tolerance which are listed as follows.

W = -10 ~ +100%	M = ± 20%
T = -10 ~ +50%	K = ± 10%
Q = -10 ~ +30%	J = ± 5%
V = -10 ~ +20%	

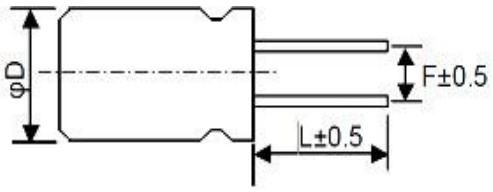
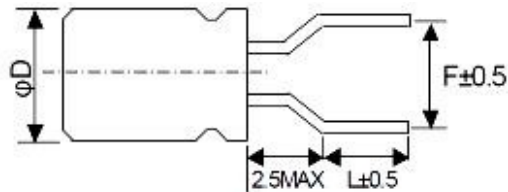
g) TERMINAL CODE:

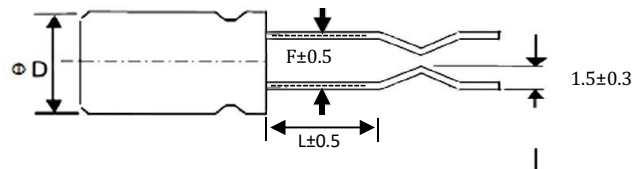
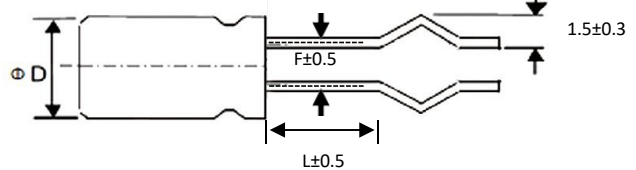
TERMINAL	CODE
RADIAL	R
SMD	M
SNAP-IN	S
SCREW TERMINAL	T

g) SLEEVE MARKING CODE:

SLEEVE	CODE
PVC	C
PET	P

Lead (Forming & Cut)

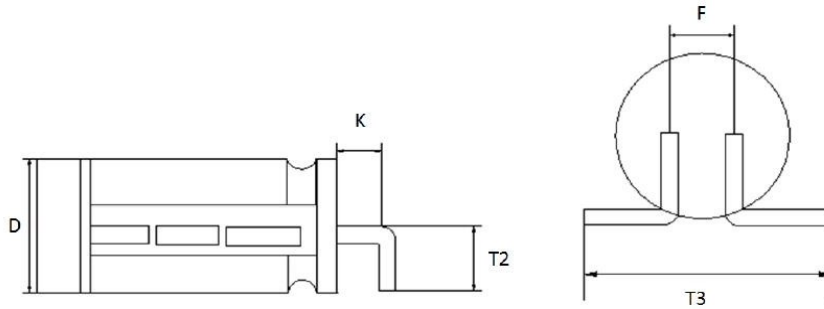
Code:C1 RANGE:φ4~18			Code:C2 RANGE:φ4~8		
					
φD	F	L	φD	F	L
5	2.0	3.0~12.0	5	5.0	3.5, 4.5, 5.0, 7.0
6.3	2.5	3.0~12.0	6.3	5.0	3.5, 4.5, 5.0, 7.0
8	3.5	3.0~12.0	8	5.0	3.5, 4.5, 5.0, 7.0
10	5.0	3.0~12.0			
13	5.0	3.0~12.0			
16	7.5	3.0~12.0			
18	7.5	3.0~12.0			

Code:C5 ~ C4 RANGE:φ4~18		
		
		
φD	F	L
6.3	2.5	16~22
8	3.5	16~22
10~13	5.0	16~22
16	7.5	16~22
18	7.5	16~22

SMD Type Forming

Code: T0

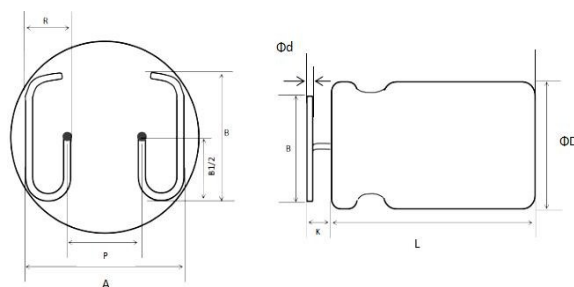
$\phi 6.3 \sim 10$



	$\Phi 6.3$	$\Phi 8$	$\Phi 10$
D	$6.3+0.5\text{max.}$	$8+0.5\text{max.}$	$10+0.5\text{max.}$
F	2.5 ± 0.5	3.5 ± 0.5	5 ± 0.5
K	1.5 ± 0.5	1.5 ± 0.5	1.5 ± 0.5
T2	$(0.5D+0.5)+0.3\text{max.}$	$(0.5D+0.5)+0.3\text{max.}$	$(0.5D+0.5)+0.3\text{max.}$
T3	$D\pm 0.5$		

M Code: Mo

RANGE: $\phi 5 \sim 10$

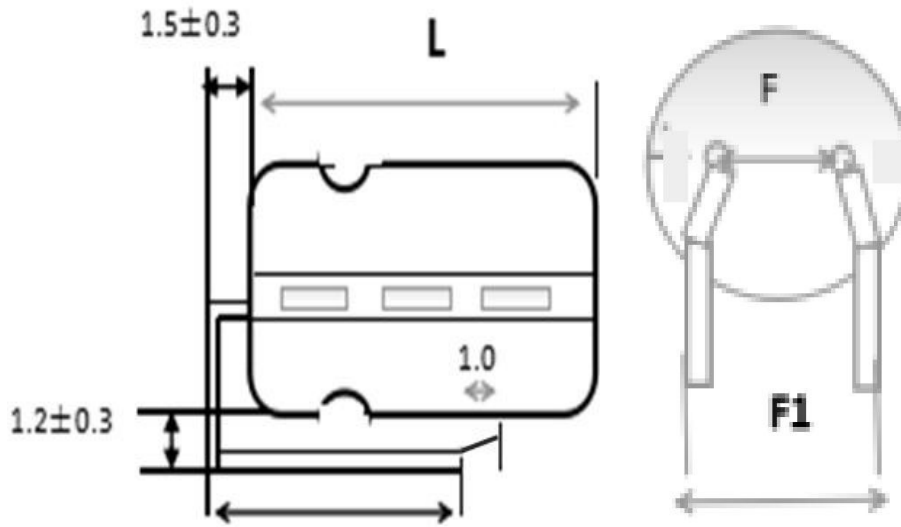


NO.	$\Phi 5$	$\Phi 6.3$	$\Phi 8$	$\Phi 10$
ΦD	5 ± 0.5	6.3 ± 0.5	8.0 ± 0.5	10.0 ± 0.5
K	1.5 ± 0.5	1.5 ± 0.5	1.5 ± 0.5	1.5 ± 0.5
A	4.8 ± 0.5	6.0 ± 0.5	7.1 ± 0.5	8.5 ± 0.5
B	4.1 ± 0.5	5.0 ± 0.5	5.5 ± 0.5	6.0 ± 0.5
P	2.0 ± 0.5	2.5 ± 0.5	3.5 ± 0.5	5 ± 0.5
R	1.5 ± 0.3	2.0 ± 0.3	2.2 ± 0.3	2.2 ± 0.3
Φd	0.5 ± 0.05	0.5 ± 0.05	0.6 ± 0.05	0.6 ± 0.05

SMD Type Forming

Code: Lo

RANGE: $\phi 6.3 \sim 10$



ϕD	$F1 \pm 0.3$
6.3	4.5
8	6.0
10	7.5

$$L1 = \left(\frac{2}{3} L + 2 \right) \pm 0.5$$

Lead Forming Taping Specifications:

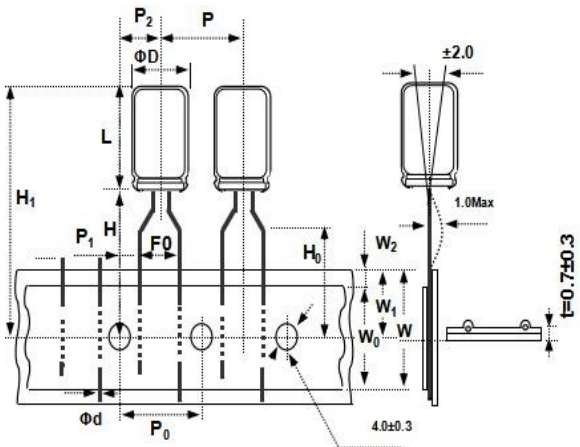


Fig.1 : Φ4~Φ8 5.0mm

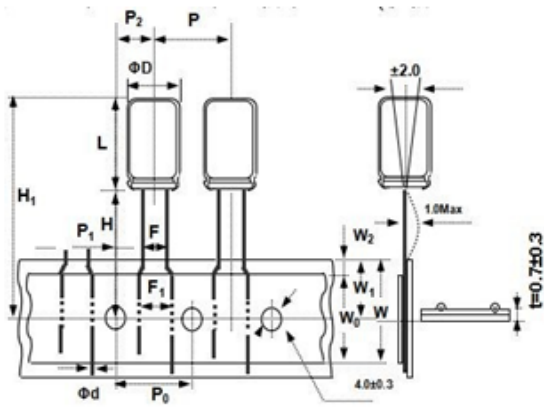


Fig.2 : Φ4~Φ5 1.5mm & 2.0mm

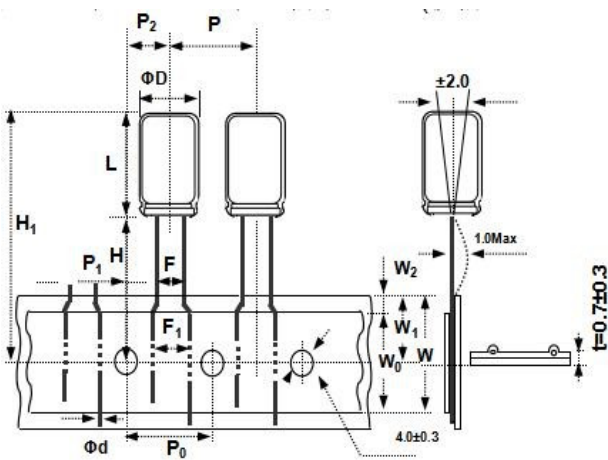


Fig.3 : Φ4~Φ8 1.5mm & 3.5mm



IPS SERIES:

+105°C Load life: 2000hours.

Standard, Used for lead free-reflow.

RoHS Compliant.

IPS It's a low ESR&large permissible ripple current series. Suitable for use with- DC-DC converts voltage regulators. Motherboard, servers, VGA, USB-PD.etc.

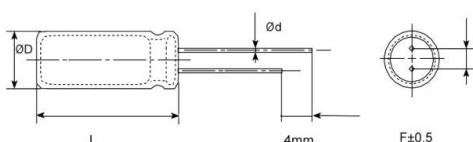
SPECIFICATIONS

Items	Characteristics														
Operating Temperature Range	-55~+105°C														
Rated Voltage Range	2.5V~100Vdc														
Capacitance Tolerance	± 20% (120Hz, +25°C)														
Leakage Current	≤0.2CV or 500µA, whichever is Lower.														
	I:Max.leakage current (µA),Nominal capacitance (µF),V: Rated voltage (V) (at 25°C, after 3 minutes)														
Dissipation Factor (tanδ) (+25°C, 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>2.5</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35~100V</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max.)</td> <td>0.08</td> <td>0.08</td> <td>0.12</td> <td>0.12</td> <td>0.12</td> <td>0.10</td> </tr> </tbody> </table>	Rated Voltage)	2.5	6.3	10	16	25	35~100V	Tanδ (max.)	0.08	0.08	0.12	0.12	0.12	0.10
	Rated Voltage)	2.5	6.3	10	16	25	35~100V								
Tanδ (max.)	0.08	0.08	0.12	0.12	0.12	0.10									
Temperature characteristics (Impedance ratio at 120Hz)	$Z(+105^{\circ}\text{C}) / Z(+25^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C}) / Z(+25^{\circ}\text{C}) \leq 1.25$														
Load Life	After 2000hours' application of voltage at 105°C,and then being stabilized at +25°C,the capacitors shall meet the following requirement:														
	<table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Equivalent Series Resistance</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	Within ±20% of the initial value	D.F. (tanδ)	Not more than 150% of the initial specified value	Equivalent Series Resistance	Not more than 150% of the initial specified value	Leakage Current	Not more than The initial specified value						
	Capacitance Change	Within ±20% of the initial value													
	D.F. (tanδ)	Not more than 150% of the initial specified value													
	Equivalent Series Resistance	Not more than 150% of the initial specified value													
Leakage Current	Not more than The initial specified value														
Damp heat(Steady state)	60°C, 90~95%RH, 1000hours, No-applied voltage.														
Surge Test	After subjecting to 1000 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 :														
	<table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Equivalent Series Resistance</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	Within ±20% of the initial value	D.F. (tanδ)	Not more than 150% of the initial specified value	Equivalent Series Resistance	Not more than 150% of the initial specified value	Leakage Current	Not more than The initial specified value						
	Capacitance Change	Within ±20% of the initial value													
	D.F. (tanδ)	Not more than 150% of the initial specified value													
	Equivalent Series Resistance	Not more than 150% of the initial specified value													
Leakage Current	Not more than The initial specified value														

When in doubt, apply the following voltage treatment and measure.

Voltage processing: under the condition of 105°C ambient temperature, continuous load voltage of 120 minutes, Load voltage is rated voltage.

Size (mm)



ØD (+0.5max)	5	6.3	8	10
Ød (±0.05)	0.5	0.6	0.6	0.6
F (±0.5)	2.0	2.5	3.5	5.0
L	L+1max.			

IPS Series

STANDARD RATINGS

Rated Voltage(V)	CAP(μF)	Size ØDXL(mm)	LC(μA)	ESR (mΩ/at 100k~300kHz 25°C max)	Rated R.C. (mA/rms at 100kHz, 105°C)
2.5	330	5×7	500	20	2900
	470	5×9	500	20	2900
	470	6.3×7	500	20	3100
	560	5×9	500	20	3100
	560	6.3×9	500	12	3100
	820	6.3×9	500	12	3900
	820	8×8	500	12	5400
	1000	6.3×9	500	12	3900
	1000	8×8	500	12	5400
	1000	8×12	500	12	5400
	1500	8×8	750	12	5400
	1500	8×12	750	12	5400
	1500	10×12	750	12	5400
	2200	10×12	1100	12	5400
3300	10×12	1650	12	5400	
4	330	5×7	500	20	2900
	470	5×9	500	20	2900
	560	6.3×9	500	12	3900
	820	6.3×9	656	12	3900
	1000	6.3×9	800	12	3900
	1200	8×8	960	12	5400
	1500	8×8	1200	12	5400
	1500	8×12	1200	12	5400
6.3	100	5×7	500	20	2200
	220	5×7	500	20	2200
	220	6.3×6	500	20	2700
	270	5×8	500	15	2700
	270	6.3×6	500	20	2700
	330	5×8	500	15	2700
	390	5×9	500	15	2700
	470	5×9	592	15	2700
	470	6.3×8	592	12	3900
	470	8×8	592	12	3900
	500	5.5×9	630	15	3100
	560	6.3×8	706	12	3900
	560	8×8	706	12	4700
	680	6.3×8	857	12	4300
	680	8×8	857	12	4500
	820	6.3×9	1033	12	4500
	820	8×8	1033	12	4500
	1000	6.3×11	1260	12	4000
	1000	8×8	1260	12	4500
	1000	8×12	1260	12	5400
	1200	8×8	1512	12	4500
1200	8×12	1512	12	5400	
1500	8×12	1890	12	5400	
1500	10×12	1890	12	6100	
2200	10×12	2772	12	6100	
3300	10×12	4158	12	6100	
7.5	270	5×8	500	20	2400
	330	5×9	500	20	2500
	390	5×9	585	20	2500
	470	6.3×8	705	12	4300
	560	6.3×8	840	12	4300
	680	6.3×9	1020	12	4300
	820	6.3×9	1230	12	4300
	820	8×8	1230	12	4500
	1000	6.3×11	1500	12	4000
	1000	8×8	1500	12	4500
1500	8×12	2250	12	5500	

IPS Series

STANDARD RATINGS

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	LC(uA)	ESR (mΩ/at 100k~300kHz 20°C max)	Rated R.C. (mA/rms at 100kHz, 105°C)
10	100	5×7	500	20	2200
	150	5×7	500	20	2200
	150	6.3×5.4	500	20	2400
	220	5×9	500	20	2500
	270	6.3×7	540	20	3300
	330	6.3×8	660	14	4000
	470	6.3×9	940	14	4100
	560	6.3×11	1120	14	4100
	560	8×8	1120	14	4300
	680	6.3×11	1360	14	4100
	820	8×12	1640	14	5000
	1000	8×12	2000	14	4700
	1200	10×12	2400	14	5000
1500	10×12	3000	14	5000	
16	47	5×7	500	24	1800
	68	5×7	500	24	1800
	82	5×7	500	24	1800
	100	5×7	500	24	1800
	100	5×8	500	14	2000
	150	5×9	500	20	2200
	180	6.3×6	576	24	2100
	220	6.3×8	704	14	3100
	270	6.3×8	864	14	3100
	330	6.3×9	1056	14	3300
	390	6.3×11	1248	14	3900
	470	6.3×11	1504	14	3900
	470	8×12	1504	14	4300
	560	8×8	1792	14	3700
	560	8×12	1792	14	4300
	680	8×12	2176	14	4300
	820	8×12	2624	14	4300
	820	10×12	2624	14	5400
1000	10×12	3200	14	5400	
1200	10×12	3840	14	5400	
20	47	6.3×5.4	500	30	2000
	68	6.3×5.4	500	30	2000
	82	6.3×5.4	500	30	2000
	100	6.3×9	500	25	2200
	220	8×8	880	24	2600
	330	8×12	1320	24	3100
	390	8×12	1560	24	3100
	470	8×12	1880	24	3100
	560	8×12	2240	24	3100
	680	10×12	2720	24	3100
	820	10×12	3280	24	3100
	1000	10×12	4000	24	3100
25	6.8	6.3×6	500	40	1800
	10	6.3×6	500	40	1800
	22	6.3×6	500	40	1800
	33	6.3×6	500	40	1800
	47	6.3×6	500	35	2000
	56	6.3×7	500	35	2000
	68	6.3×9	500	30	2600
	82	6.3×9	500	30	2600
	100	8×8	500	25	2900
	220	8×12	1100	25	3200
	270	8×12	1350	25	3200
	330	8×12	1650	25	3200
	390	10×12	1950	25	4000
470	10×12	2350	25	4000	

IPS Series

STANDARD RATINGS

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	LC(uA)	ESR (mΩ/at 100k~300kHz 20°C max)	Rated R.C. (mA/rmsat 100kHz,105°C)
35	47	5×8	500	48	1300
	47	6.3×7	500	48	1600
	68	6.3×7	500	48	1600
	82	6.3×9	574	48	1800
	100	6.3×7	700	48	1600
	100	6.3×8	700	40	1900
	100	6.3×9	700	35	2100
	100	8×8	700	35	2300
	150	6.3×11	1050	35	2300
	150	8×8	1050	35	2300
	180	8×8	1260	35	2300
	220	8×8	1540	32	2400
	220	8×12	1540	32	2800
	330	8×16	2310	30	3300
	330	10×12	2310	28	3800
	470	10×16	3290	28	4300
	560	10×16	3920	28	4300
	680	10×16	4760	28	4300
820	10×16	5740	28	4300	
1000	10×16	7000	28	4300	
50	27	6.3×7	500	48	1600
	33	6.3×9	500	45	1800
	47	6.3×9	500	42	1900
	68	6.3×11	680	42	2100
	68	8×10	680	42	2300
	82	8×12	820	40	2500
	100	8×12	1000	40	2500
	150	8×16	1500	38	2900
	220	10×12	2200	38	2900
	220	10×16	2200	35	3500
	270	10×16	2700	32	3600
63	22	6.3×7	500	50	1500
	27	6.3×9	500	50	1600
	33	6.3×9	500	45	1750
	47	6.3×11	592	45	1900
	47	8×8	592	45	2000
	56	8×12	706	42	2500
	82	8×12	1033	40	2500
	100	8×16	1260	38	2600
	100	10×12	1260	35	2700
	150	10×12	1890	35	2900
	180	10×16	2268	32	3100
80	33	8×8	528	55	1500
	39	8×10	624	50	1700
	56	8×12	896	45	1900
	68	8×16	1088	42	2000
	100	10×12	1600	40	2300
	120	10×16	1920	36	2600
100	18	8×8	500	55	1500
	22	8×8	500	50	1700
	27	8×12	540	45	1900
	39	8×16	780	42	2000
	56	10×12	1120	40	2300
	68	10×16	1360	36	2600

IPL SERIES:



+105°C Load life: 5000hours.

Long life, Used for lead free-reflow. RoHS Compliant.

Super long life to 5000hrs, it's a super long life series based on our IPL series. Suitable for use with long duration electronic device. Motherboard.servers.VGA.adapters.etc.

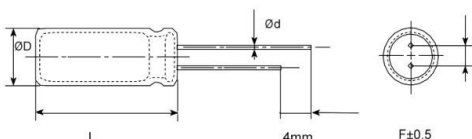
SPECIFICATIONS

Items	Characteristics														
Operating Temperature Range	-55~+105°C														
Rated Voltage Range	2.5V~100Vdc														
Capacitance Tolerance	± 20% (120Hz, +25°C)														
Leakage Current	I≤0.2CV or 500μA, whichever is Lower.														
	I:Max.leakage current (μA),N:Nominal capacitance (μF),V: Rated voltage (V) (at 25°C, after 3 minutes)														
Dissipation Factor (tanδ) (+25°C, 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>2.5</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35~100V</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max.)</td> <td>0.08</td> <td>0.08</td> <td>0.12</td> <td>0.12</td> <td>0.12</td> <td>0.10</td> </tr> </tbody> </table>	Rated Voltage)	2.5	6.3	10	16	25	35~100V	Tanδ (max.)	0.08	0.08	0.12	0.12	0.12	0.10
	Rated Voltage)	2.5	6.3	10	16	25	35~100V								
Tanδ (max.)	0.08	0.08	0.12	0.12	0.12	0.10									
Temperature characteristics (Impedance ratio at 120Hz)	$Z(+105^{\circ}\text{C}) / Z(+25^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C}) / Z(+25^{\circ}\text{C}) \leq 1.25$														
Load Life	After 2000hours' application of voltage at 105°C,and then being stabilized at +25°C,the capacitors shall meet the following requirement:														
	Capacitance Change	Within ±20% of the initial value													
	D.F. (tanδ)	Not more than 150% of the initial specified value													
	Equivalent Series Resistance	Not more than 150% of the initial specified value													
	Leakage Current	Not more than The initial specified value													
Damp heat(Steady state)	60°C, 90~95%RH, 1000hours, No-applied voltage.														
	Capacitance Change	Within ±20% of the initial value													
	D.F. (tanδ)	Not more than 150% of the initial specified value													
	Equivalent Series Resistance	Not more than 150% of the initial specified value													
	Leakage Current	Not more than The initial specified value													
Surge Test	After subjecting to 1000 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 :														
	Capacitance Change	Within ±20% of the initial value													
	D.F. (tanδ)	Not more than 150% of the initial specified value													
	Equivalent Series Resistance	Not more than 150% of the initial specified value													
	Leakage Current	Not more than The initial specified value													

When in doubt, apply the following voltage treatment and measure.

Voltage processing: under the condition of 105°C ambient temperature, continuous load voltage of 120 minutes, Load voltage is rated voltage.

Size (mm)



ØD (+0.5max)	5	5.5	6.3	8	10
Ød (±0.05)	0.5	0.5	0.5	0.6	0.6
F (±0.5)	2.0	2.5	2.5	3.5	5.0
L	L+1max.				

IPL Series

STANDARD RATINGS

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	LC(uA)	ESR (mΩ/at 100k~300kHz 20°C max)	Rated R.C. (mA/rmsat 100kHz,105°C)
2.5	470	6.3×9	500	8	5400
	560	6.3×9	500	8	5400
	820	6.3×9	500	8	5400
	1000	8×8	500	8	6100
	1500	10×12	750	8	6100
	2200	10×12	1100	8	6100
4	470	6.3×9	500	8	5400
	560	8×8	500	8	6100
	820	8×8	656	8	6100
	1000	8×8	800	8	6100
	1200	8×12	960	8	6100
	1500	10×12	1200	8	6100
6.3	470	6.3×8	592	10	4700
	560	6.3×8	706	10	4700
	560	8×8	706	10	5000
	820	8×8	1033	10	5100
	820	8×12	1033	10	5900
	1000	8×12	1260	10	5900
10	1500	10×12	1890	10	6100
	330	8×8	660	12	4700
	390	8×12	780	12	5400
	470	8×12	940	12	5400
	560	10×12	1120	11	5600
	680	10×12	1360	11	5600
16	1000	10×12	2000	11	5600
	220	6.3×8	704	10	3700
	270	8×8	864	10	4500
	330	8×12	1056	10	5100
	470	8×12	1504	10	5100
	560	10×12	1792	10	5400
20	680	10×12	2176	10	5400
	220	8×8	880	25	3300
	270	8×12	1080	25	3600
	330	10×12	1320	25	3600
	470	10×12	1880	25	3600
	100	8×8	500	20	3100
25	220	8×12	1100	20	3600
	330	8×12	1650	20	3600
	470	8×12	2350	20	3600
	560	8×16	2800	20	4100
	680	10×12	3400	17	4300
	1000	10×16	5000	15	5300
35	100	8×12	700	32	2900
	220	8×16	1540	30	3100
	330	10×12	2310	28	3300
	470	10×16	3290	28	3500
50	47	8×12	500	40	2300
	68	8×12	680	40	2400
	100	10×12	1000	35	2900
	150	10×16	1500	32	3100
63	47	8×12	592	40	2400
	68	8×16	857	38	2600
	150	10×12	1890	35	2900
	180	10×16	2268	32	3100
80	27	8×12	500	45	1900
	33	8×16	528	42	2000
	47	10×12	752	40	2300
	68	10×16	1088	36	2600
100	22	8×12	500	45	1900
	27	8×16	540	42	2000
	33	10×12	660	40	2300
	47	10×16	940	36	2600

IPH SERIES:



+125°C Load life: 2000hours.

Long life, Used for lead free-reflow.

RoHS Compliant.

This series advanced characteristics in resistance to heat compared with the IPH series. Suitable for use in increasing device reliability.

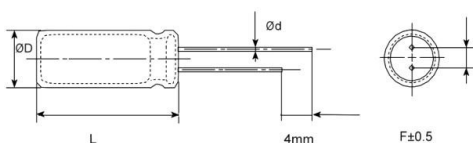
SPECIFICATIONS

Items	Characteristics												
Operating Temperature Range	-55~+125°C												
Rated Voltage Range	6.3V~100Vdc												
Capacitance Tolerance	± 20% (120Hz, +25°C)												
Leakage Current	<p>$I \leq 0.2CV$ or $500\mu A$, whichever is Lower.</p> <p>I: Max.leakage current (μA), Nominal capacitance (μF), V: Rated voltage (V) (at 25°C, after 3 minutes)</p>												
Dissipation Factor (tan δ) (+25°C, 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35~100V</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max.)</td> <td>0.08</td> <td>0.12</td> <td>0.12</td> <td>0.12</td> <td>0.10</td> </tr> </tbody> </table>	Rated Voltage)	6.3	10	16	25	35~100V	Tan δ (max.)	0.08	0.12	0.12	0.12	0.10
Rated Voltage)	6.3	10	16	25	35~100V								
Tan δ (max.)	0.08	0.12	0.12	0.12	0.10								
Temperature characteristics (Impedance ratio at 120Hz)	<p>$Z(+105^\circ C) / Z(+25^\circ C) \leq 1.25$</p> <p>$Z(-55^\circ C) / Z(+25^\circ C) \leq 1.25$</p>												
Load Life	<p>After 2000hours' application of voltage at 125°C, and then being stabilized at +25°C, the capacitors shall meet the following requirement:</p> <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Equivalent Series Resistance</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	Within ±20% of the initial value	D.F. (tan δ)	Not more than 150% of the initial specified value	Equivalent Series Resistance	Not more than 150% of the initial specified value	Leakage Current	Not more than The initial specified value				
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Equivalent Series Resistance	Not more than 150% of the initial specified value												
Leakage Current	Not more than The initial specified value												
Damp heat (Steady state)	<p>60°C, 90~95%RH, 1000hours, No-applied voltage.</p> <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Equivalent Series Resistance</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	Within ±20% of the initial value	D.F. (tan δ)	Not more than 150% of the initial specified value	Equivalent Series Resistance	Not more than 150% of the initial specified value	Leakage Current	Not more than The initial specified value				
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Surge Test	<p>After subjecting to 1000 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 :</p> <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Equivalent Series Resistance</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	Within ±20% of the initial value	D.F. (tan δ)	Not more than 150% of the initial specified value	Equivalent Series Resistance	Not more than 150% of the initial specified value	Leakage Current	Not more than The initial specified value				
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Leakage Current	Not more than The initial specified value												

When in doubt, apply the following voltage treatment and measure.

Voltage processing: under the condition of 125°C ambient temperature, continuous load voltage of 120 minutes, Load voltage is rated voltage.

Size (mm)



ØD (+0.5max)	5	6.3	8	10
Ød (±0.05)	0.5	0.6	0.6	0.6
F (±0.5)	2.0	2.5	3.5	5.0
L	L+1max.			

IPH Series

STANDARD RATINGS

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	LC(uA)	ESR (mΩ/at 100k~300kHz 20°C max)	Rated R.C. (mA/rms at 100kHz, 105°C)
6.3	470	6.3×9	592	11	3900
	560	6.3×9	706	11	3900
	820	8×8	1033	10	4500
	1000	8×12	1260	10	5000
10	330	6.3×8	660	14	3000
	470	8×8	940	12	3750
	560	8×8	1120	12	3750
	1000	10×12.5	2000	11	5300
16	220	6.3×8	704	12	3120
	270	8×8	864	11	3750
	330	8×12	1056	10	4630
	470	8×12	1504	10	4630
	820	8×15	2624	10	5000
	1000	10×16	3200	10	5810
25	100	6.3×8	500	25	2400
	220	8×12	1100	20	3000
	330	8×12	1650	20	3000
	470	10×12.5	2350	20	4000
	680	10×12.5	3400	20	4000
35	47	6.3×8	329	40	1800
	100	8×8	700	30	2270
	220	8×12	1540	20	3200
	330	10×12.5	2310	20	3750
	470	10×16	3290	28	4100
50	47	8×9	500	30	2080
	68	8×12	680	30	2280
	100	10×12	1000	28	3000
63	47	8×12	592	40	2130
	56	8×12	706	40	2130
	100	8×16	1260	35	2590
	150	10×17	1890	30	3070
80	33	8×12	500	45	2010
	47	8×16	752	40	2420
	47	10×12	752	40	2660
100	22	8×12	500	40	1800
	33	10×12.5	660	40	2660
	47	10×12.5	940	40	2660

IPD SERIES:



+105°C Load life: 2000hours.

Standard, Used for lead free-reflow.

RoHS Compliant.

Standard life to 2000hrs, it's a standard life series based on our IPD series. Suitable for use with long duration electronic device. Motherboard.servers.VGA.adapters.etc.

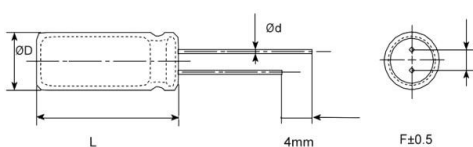
SPECIFICATIONS

Items	Characteristics														
Operating Temperature Range	-55~+105°C														
Rated Voltage Range	2.5V~100Vdc														
Capacitance Tolerance	± 20% (120Hz, +25°C)														
Leakage Current	$I \leq 0.2CV$ or $500\mu A$, whichever is Lower. I: Max.leakage current (μA), Nominal capacitance (μF), V: Rated voltage (V) (at 25°C, after 3 minutes)														
Dissipation Factor (tan δ) (+25°C, 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>2.5</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35~100V</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max.)</td> <td>0.08</td> <td>0.08</td> <td>0.12</td> <td>0.12</td> <td>0.12</td> <td>0.10</td> </tr> </tbody> </table>	Rated Voltage)	2.5	6.3	10	16	25	35~100V	Tan δ (max.)	0.08	0.08	0.12	0.12	0.12	0.10
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Tan δ (max.)	0.08	0.08	0.12	0.12	0.12	0.10									
Temperature characteristics (Impedance ratio at 120Hz)	$Z(+105^\circ C) / Z(+25^\circ C) \leq 1.25$ $Z(-55^\circ C) / Z(+25^\circ C) \leq 1.25$														
Load Life	After 2000hours' application of voltage at 105°C, and then being stabilized at +25°C, the capacitors shall meet the following requirement: <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Equivalent Series Resistance</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	Within ±20% of the initial value	D.F. (tan δ)	Not more than 150% of the initial specified value	Equivalent Series Resistance	Not more than 150% of the initial specified value	Leakage Current	Not more than The initial specified value						
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Leakage Current	Not more than The initial specified value														
Damp heat (Steady state)	60°C, 90~95%RH, 1000hours, No-applied voltage. <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Equivalent Series Resistance</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	Within ±20% of the initial value	D.F. (tan δ)	Not more than 150% of the initial specified value	Equivalent Series Resistance	Not more than 150% of the initial specified value	Leakage Current	Not more than The initial specified value						
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Surge Test	After subjecting to 1000 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 : <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within ±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Equivalent Series Resistance</td> <td>Not more than 150% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	Within ±20% of the initial value	D.F. (tan δ)	Not more than 150% of the initial specified value	Equivalent Series Resistance	Not more than 150% of the initial specified value	Leakage Current	Not more than The initial specified value						
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D.F. (tan δ)	Not more than 150% of the initial specified value														
Equivalent Series Resistance	Not more than 150% of the initial specified value														
Leakage Current	Not more than The initial specified value														

When in doubt, apply the following voltage treatment and measure.

Voltage processing: under the condition of 105°C ambient temperature, continuous load voltage of 120 minutes, Load voltage is rated voltage.

Size (mm)



ØD (+0.5max)	5	5.5	6.3	8	10
Ød (±0.05)	0.5	0.5	0.5	0.6	0.6
F (±0.5)	2.0	2.5	2.5	3.5	5.0
L	L+1max.				

IPD Series

STANDARD RATINGS

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	LC(uA)	ESR (mΩ/at 100k~300kHz 20°C max)	Rated R.C. (mA/rmsat 100kHz,105°C)
2.5	470	6.3×9	500	8	5400
	560	6.3×9	500	8	5400
	820	6.3×9	500	8	5400
	1000	8×8	500	8	6100
	1500	10×12	750	8	6100
	2200	10×12	1100	8	6100
4	470	6.3×9	500	8	5400
	560	8×8	500	8	6100
	820	8×8	656	8	6100
	1000	8×8	800	8	6100
	1200	8×12	960	8	6100
	1500	10×12	1200	8	6100
6.3	470	6.3×8	592	10	4700
	560	6.3×8	706	10	4700
	560	8×8	706	10	5000
	820	8×8	1033	10	5100
	820	8×12	1033	10	5900
	1000	8×12	1260	10	5900
	1500	10×12	1890	10	6100
10	330	8×8	660	12	4700
	390	8×12	780	12	5400
	470	8×12	940	12	5400
	560	10×12	1120	11	5600
	680	10×12	1360	11	5600
	1000	10×12	2000	11	5600
16	220	6.3×8	704	10	3700
	270	8×8	864	10	4500
	330	8×12	1056	10	5100
	470	8×12	1504	10	5100
	560	10×12	1792	10	5400
	680	10×12	2176	10	5400
20	220	8×8	880	25	3300
	270	8×12	1080	25	3600
	330	10×12	1320	25	3600
	470	10×12	1880	25	3600
25	100	8×8	500	20	3100
	220	8×12	1100	20	3600
	330	8×12	1650	20	3600
	470	8×12	2350	20	3600
	560	8×16	2800	20	4100
	680	10×12	3400	17	4300
	1000	10×16	5000	15	5300
35	100	8×12	700	32	2900
	220	8×16	1540	30	3100
	330	10×12	2310	28	3300
	470	10×16	3290	28	3500
50	47	8×12	500	40	2300
	68	8×12	680	40	2400
	100	10×12	1000	35	2900
	150	10×16	1500	32	3100
63	47	8×12	592	40	2400
	68	8×16	857	38	2600
	150	10×12	1890	35	2900
	180	10×16	2268	32	3100
80	27	8×12	500	45	1900
	33	8×16	528	42	2000
	47	10×12	752	40	2300
	68	10×16	1088	36	2600
100	22	8×12	500	45	1900
	27	8×16	540	42	2000
	33	10×12	660	40	2300
	47	10×16	940	36	2600

IPE SERIES:



+105°C Load life: 5000hours.

Long life, Used for lead free-reflow.

RoHS Compliant.

Ultra low leakage, suitable for mobile power banks, battery management modules, or in car applications.

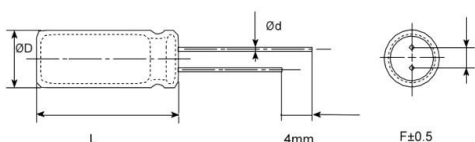
SPECIFICATIONS

Items	Characteristics
Operating Temperature Range	-55~+105°C
Rated Voltage Range	10V~63Vdc
Capacitance Tolerance	± 20% (120Hz, +25°C)
Leakage Current	I ≤ 0.2CV or 70µA, whichever is Lower.
	I: Max.leakage current (µA), Nominal capacitance (µF), V: Rated voltage (V) (at 25°C, after 3 minutes)
Dissipation Factor (tanδ) (+25°C, 120Hz)	Rated Voltage)
	Tanδ (max.)
Temperature characteristics (Impedance ratio at 120Hz)	Z(+105°C) /Z(+25°C) ≤1.25
	Z(-55°C)/Z(+25°C) ≤1.25
Load Life	After 5000hours' application of voltage at 105°C, and then being stabilized at +25°C, the capacitors shall meet the following requirement:
	Capacitance Change
	D.F. (tanδ)
	Equivalent Series Resistance
	Leakage Current
Damp heat(Steady state)	60°C, 90~95%RH, 1000hours, No-applied voltage.
	Capacitance Change
	D.F. (tanδ)
	Equivalent Series Resistance
	Leakage Current
Surge Test	After subjecting to 1000 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 :
	Capacitance Change
	D.F. (tanδ)
	Equivalent Series Resistance
	Leakage Current

When in doubt, apply the following voltage treatment and measure.

Voltage processing: under the condition of 105°C ambient temperature, continuous load voltage of 120 minutes, Load voltage is rated voltage.

Size (mm)



ØD (+0.5max)	5	6.3	8	10
Ød (±0.05)	0.5	0.6	0.6	0.6
F (±0.5)	2.0	2.5	3.5	5.0
L	L+1max.			

IPE Series

STANDARD RATINGS

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	LC(uA)	ESR (mΩ/at 100k~300kHz 20°C max)	Rated R.C. (mA/rmsat100kHz,105°C)
10	330	6.3×8	70	25	2130
	470	8×8	94	15	3500
	560	8×8	112	15	3500
	1000	10×12	200	13	5000
16	220	6.3×8	70	15	3120
	270	8×8	86	12	3750
	330	8×12	106	12	4630
	470	8×12	150	12	4630
	820	8×15	262	11	5000
	1000	10×16	320	10	5810
25	100	6.3×5.8	70	70	1400
	100	6.3×8	70	25	2400
	220	8×12	110	20	3000
	330	8×12	165	20	3000
	390	6.3×12	195	25	2800
	390	8×12	195	20	3600
	470	10×12.5	235	20	4000
	680	10×12.5	340	20	4000
35	47	6.3×8	329	40	1800
	100	8×8	700	30	2270
	220	8×12	1540	20	3200
	330	10×12.5	2310	20	3750
	470	10×16	3290	28	4100
50	47	8×9	500	30	2080
	68	8×12	680	30	2280
	100	10×12	1000	28	3000
63	47	8×12	592	40	2130
	56	8×12	706	40	2130
	100	8×16	1260	35	2590
	150	10×17	1890	30	3070



IT Series:

+105°C, Load life: 2000hours.

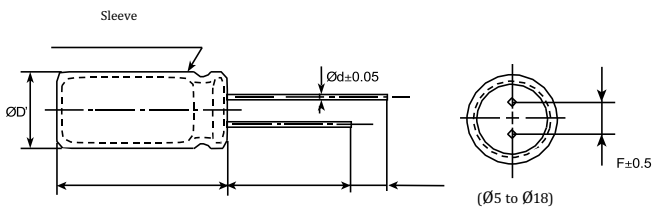
Extremely low leakage current.

RoHS Compliant.

SPECIFICATIONS

Items	Characteristics																											
Operating Temperature Range	-40~+105°C																											
Rated Voltage Range	6.3V~100Vdc																											
Capacitance Tolerance	± 20% (120Hz, +25°C)																											
Leakage Current	≤0.002CV or 3μA, whichever is Lower.																											
	I:Max.leakage current (μA),C: Nominal capacitance (μF),V: Rated voltage (V) (at 25°C, after 3 minutes)																											
Dissipation Factor (tanδ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.																											
	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max.)</td> <td>0.22</td> <td>0.20</td> <td>0.16</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> </tr> </tbody> </table>	Rated Voltage)	10	16	25	35	50	63	80	100	Tanδ (max.)	0.22	0.20	0.16	0.16	0.14	0.12	0.10	0.10									
Rated Voltage)	10	16	25	35	50	63	80	100																				
Tanδ (max.)	0.22	0.20	0.16	0.16	0.14	0.12	0.10	0.10																				
Temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+25°C)</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(+25°C)</td> <td>8</td> <td>6</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Rated Voltage)	10	16	25	35	50	63	80	100	Z(-25°C)/Z(+25°C)	4	3	3	2	2	2	2	2	Z(-40°C)/Z(+25°C)	8	6	6	5	4	3	3	3
	Rated Voltage)	10	16	25	35	50	63	80	100																			
	Z(-25°C)/Z(+25°C)	4	3	3	2	2	2	2	2																			
Z(-40°C)/Z(+25°C)	8	6	6	5	4	3	3	3																				
The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C :																												
Load Life	<table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>≤200% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>≤The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	±20% of the initial value	D.F. (tanδ)	≤200% of the initial specified value	Leakage Current	≤The initial specified value																					
	Capacitance Change	±20% of the initial value																										
	D.F. (tanδ)	≤200% of the initial specified value																										
Leakage Current	≤The initial specified value																											
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1,000 hours at 105°C without voltage applied:																											
	Capacitance change: ±20% of the initial measured value																											
	Dissipation factor: ≤200% of the initial specified value																											
	Leakage current: ≤200% of the initial specified value																											

Size (mm)



ØD	5	6.3	8	10	12~13	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.						

Frequency Coefficient

Rated Voltage(V)	Freq.(Hz) CAP(μF)	120	500	1K	≥10K
		6.3~100	<100	1.00	1.35
	120~1000	1.00	1.23	1.32	1.45
	1200~4700	1.00	1.10	1.12	1.12

IT Series:

STANDARD RATINGS

Maximum Allowable Ripple Current (mA rms) at 105°C 120Hz

Rated Voltage(V)	10V		16V		25V		35V		50V		63V	
Items cap (μF)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)
1.0											4X7 5X11	13 15
2.2									5×11	20	5×11	15
3.3									5×11	25		
4.7					5×11	26	5×11	28	5×11	30	5×11	32
10			5×11	35	5×11	38	5×11	41	4×7 5×11	42 48	5×11	50
22	5×11	49	5×11	54	5×11	57	5×11	61	5×11	68	6.3×12	82
33	5×11	60	5×11	64	5×11	69	5×11	75	6.3×12	90	6.3×12	100
47	5×11	70	5×11	99	5×11	82	6.3×12	100	6.3×12	110	8×12	135
100	5×11	105	6.3×12	125	6.3×12	135	8×12	170	8×12	180	10×13	225
220	6.3×12	175	8×12	215	8×12	230	10×13	300	10×16	345	10×20	400
330	8×12	245	8×12	260	10×13	335	10×16	400	10×20	460	13×21	540
470	8×12	290	10×13	370	10×16	440	10×20	520	13×21	610	12.5×25	700
1000	10×16	550	10×20	640	13×21	770	12.5×25	920	16×25	1080	16×32	1210
2200	13×21	960	12.5×25	1000	16×25	1170	16×32	1340	18×32	1530		
3300	12.5×25	1100	16×25	1300	16×32	1460	18×32	1650				
4700	16×25	1400	16×32	1600	18×32	1780	18×40	1900				

Rated Voltage(V)	100V	
Items CAP(μF)	Size ØDXL(mm)	Ripple (mA)
1.0	5x11	18
2.2	5×11	26
3.3	5×11	32
4.7	5×11	42
10	6.3×12	56
22	8×12	96
33	10×13	140
47	10×16	180
100	13×21	320
220	16x25	570
330	16×25	700
470	16×32	880

IT5 Series



+105°C, Load life: 5000-6000 hours.,

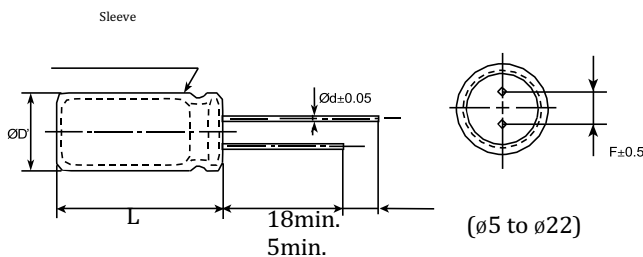
High frequency, low impedance, high ripple current.

RoHS Compliant.

SPECIFICATIONS

Items	Characteristics																														
Operating Temperature Range	-40~+105°C																														
Rated Voltage Range	6.3V~120Vdc																														
Capacitance Tolerance	± 20% (120Hz, +20°C)																														
Leakage Current	I≤0.01CV or 3μA, whichever is greater. I:Max.leakage current (μA), C:Nominal capacitance (μF),V: Rated voltage (V) (at 25°C, after 3 minutes)																														
Dissipation Factor (tanδ) (+25°C, 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>120</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max.)</td> <td>0.26</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.10</td> <td>0.09</td> <td>0.09</td> </tr> </tbody> </table> <p>When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.</p>	Rated Voltage	6.3	10	16	25	35	50	63	80	100	120	Tanδ (max.)	0.26	0.20	0.16	0.14	0.12	0.10	0.10	0.10	0.09	0.09								
Rated Voltage	6.3	10	16	25	35	50	63	80	100	120																					
Tanδ (max.)	0.26	0.20	0.16	0.14	0.12	0.10	0.10	0.10	0.09	0.09																					
Temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>120</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+25°C)</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(+25°C)</td> <td>6</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Rated Voltage	10	16	25	35	50	63	80	100	120	Z(-25°C)/Z(+25°C)	3	2	2	2	2	2	2	2	2	Z(-40°C)/Z(+25°C)	6	6	5	4	3	3	3	3	3
Rated Voltage	10	16	25	35	50	63	80	100	120																						
Z(-25°C)/Z(+25°C)	3	2	2	2	2	2	2	2	2																						
Z(-40°C)/Z(+25°C)	6	6	5	4	3	3	3	3	3																						
Load Life	<p>The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C :</p> <table border="1"> <thead> <tr> <th>Capacitance Change</th> <th>±20% of the initial value</th> <th>ΦD</th> <th>Load life</th> </tr> </thead> <tbody> <tr> <td>D.F. (tanδ)</td> <td>≤200% of the initial specified value</td> <td>5~6.3</td> <td>5000h</td> </tr> <tr> <td>Leakage Current</td> <td>≤The initial specified value</td> <td>≥8</td> <td>6000h</td> </tr> </tbody> </table>	Capacitance Change	±20% of the initial value	ΦD	Load life	D.F. (tanδ)	≤200% of the initial specified value	5~6.3	5000h	Leakage Current	≤The initial specified value	≥8	6000h																		
Capacitance Change	±20% of the initial value	ΦD	Load life																												
D.F. (tanδ)	≤200% of the initial specified value	5~6.3	5000h																												
Leakage Current	≤The initial specified value	≥8	6000h																												
Shelf Life	<p>The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1,000 hours at 105°C without voltage applied :</p> <p>Capacitance change : ±20% ±20% of the initial measured value Dissipation factor : ≤200% of the initial specified value Leakage current : ≤200% of the initial specified value</p>																														

Size(mm)



Frequency Coefficient

Rated Voltage(V)	Freq.(Hz)				
	CAP(μF)	120	1K	10K	100K
6.3~120	<180	0.40	0.75	0.90	1.00
	220~560	0.50	0.85	0.94	1.00
	680~1800	0.60	0.87	0.95	1.00
	2200~3900	0.75	0.90	0.95	1.00
	≥4700	0.85	0.95	0.98	1.00

ØD	5	6.3	8	10	12~13	16	18	22
Ød	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
ØD'	D<20 : ØD+0.5max. ; D≥20 : ØD+1.0max.							
L'	L+2max.							

IT5 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100 KHz

Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(μ F)	Size \varnothing DXL(mm)	ESR (Ω)	Ripple (mA)
10	100	5×11	0.308	308
	180	6.3×12	0.218	380
	220	6.3×12	0.218	391
	270	6.3×12	0.242	402
	330	6.3×12	0.218	413
	330	8×12	0.218	435
	390	8×12	0.129	721
	470	6.3×12	0.116	424
	470	8×12	0.105	732
	560	8×12	0.099	754
	680	10×12	0.079	765
	820	8×16	0.086	930
	820	10×12	0.079	985
	1000	8×16	0.083	985
	1200	10×16	0.033	1430
	1200	10×20	0.045	1540
	1500	10×16	0.059	1485
	1500	10×20	0.045	1595
	1800	10×20	0.045	1650
	2200	10×20	0.051	1815
	2200	13×21	0.035	2090
	2700	10×25	0.046	1925
	2700	13×21	0.039	2145
	3300	10×25	0.039	2338
	3300	16×20	0.035	2552
	3900	16×20	0.035	2805
	4700	13×25	0.030	2393
	4700	16×20	0.033	2613
5600	16×26	0.028	2816	
5600	18×20	0.034	2827	
6800	18×25	0.024	3058	
16	22	5×11	0.715	132
	47	5×11	0.495	143
	100	5×11	0.286	220
	220	8×12	0.129	732
	330	8×12	0.116	754
	470	8×12	0.102	792
	560	8×14	0.088	880
	680	8×16	0.086	930
	820	8×16	0.066	968
	1000	8×16	0.072	1051
	1000	10×12	0.072	1210
	1500	10×20	0.051	1595
	2200	10×25	0.037	2035
	2200	13×25	0.030	2343
	3300	13×30	0.025	2673
	3300	18×20	0.026	2750
	4700	16×30	0.022	3339
	4700	18×25	0.024	3416
	5600	18×30	0.020	3971
	6800	18×36	0.018	4125
	22	5×11	1.210	138
	82	6.3×12	0.220	380
	100	6.3×12	0.209	385
	220	8×12	0.129	754
	220	8×16	0.110	902
	330	8×12	0.086	787
	330	10×12	0.079	974
	470	8×16	0.075	1089
470	10×12	0.075	1155	
560	8×20	0.072	1276	
25	560	10×16	0.066	1331
	680	10×16	0.066	1375
	680	10×20	0.045	1546
	820	10×20	0.042	1595
	1000	10×20	0.035	2002
	1000	13×21	0.035	2096
	1500	10×25	0.046	2178
	2200	13×21	0.033	2448

Rated Voltage(V)	CAP(μ F)	Size \varnothing DXL(mm)	ESR (Ω)	Ripple (mA)	
25	2200	18×20	0.030	2756	
	3300	16×30	0.022	3339	
	3300	18×25	0.024	3355	
	4700	18×35	0.019	4059	
	4700	18×40	0.018	4125	
	5600	18×40	0.015	4169	
	35	22	5×11	0.715	198
		33	6.3×12	0.407	264
47		6.3×12	0.396	380	
56		6.3×12	0.385	391	
68		6.3×12	0.374	402	
100		8×12	0.168	721	
220		8×12	0.112	765	
220		10×12	0.079	974	
330		8×20	0.076	1155	
470		10×16	0.053	1540	
470		13×13	0.053	1595	
560		10×20	0.050	1722	
680		10×20	0.051	1854	
680		13×21	0.047	2096	
820		10×25	0.046	1815	
820		13×21	0.046	2162	
1000		13×21	0.045	2217	
1000		13×25	0.039	2453	
1500		13×35	0.022	3025	
1500		16×26	0.028	2816	
2200		16×26	0.031	2893	
2200		18×25	0.024	3058	
3300	18×35	0.019	4065		
50	1	5×11	3.190	88	
	2.2	5×11	2.750	99	
	3.3	5×11	2.200	110	
	4.7	5×11	1.870	116	
	10	5×11	1.870	127	
	22	5×11	1.320	176	
	22	6.3×12	0.396	242	
	33	6.3×12	0.297	330	
	47	6.3×12	0.275	352	
	56	8×12	0.176	616	
	68	8×12	0.168	633	
	100	8×12	0.168	792	
	100	10×12	0.123	828	
	220	10×16	0.079	1265	
	220	10×12	0.094	1045	
	330	10×20	0.047	1397	
	330	13×21	0.045	1832	
	470	10×20	0.061	1485	
	470	13×25	0.034	2151	
	560	13×25	0.034	2217	
	680	13×30	0.030	2552	
	680	16×20	0.034	2585	
820	13×35	0.025	2772		
820	18×20	0.035	2750		
1000	13×25	0.035	2475		
1000	13×35	0.033	2811		
1500	16×35	0.019	3476		
1800	16×40	0.019	3960		
1800	18×30	0.021	3850		
2200	18×30	0.021	3905		
2200	18×35	0.018	4059		

IT5 Series

STANDARD RATINGS

Maximum ESR(Ω) at 20°C 100 KHz

Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(μ F)	Size \varnothing DXL(mm)	ESR (Ω)	Ripple (mA)
63	22	6.3×12	1.056	286
	33	6.3×12	0.946	330
	47	8×12	0.479	528
	56	8×12	0.473	572
	68	8×12	0.462	605
	100	8×16	0.330	858
	100	10×12	0.363	869
	120	10×16	0.273	935
	150	8×20	0.262	1155
	180	10×20	0.166	1309
	180	13×16	0.183	1298
	220	10×20	0.166	1540
	220	13×21	0.149	1705
	330	10×25	0.119	1727
	330	13×21	0.127	1815
	470	13×21	0.083	1892
	470	13×25	0.079	2200
	560	16×26	0.057	2585
	680	13×35	0.065	2992
	680	16×26	0.057	2970
63	820	13×40	0.056	3036
	820	16×30	0.043	3036
	1000	16×30	0.043	3064
	1000	16×35	0.035	3245
	1500	18×35	0.032	4125
	4.7	5×11	1.980	85
	15	6.3×12	0.950	260
	22	8×12	0.825	407
	27	8×12	0.499	413
100	33	8×12	0.499	424
	47	10×12	0.378	550
	56	8×20	0.262	671
	68	10×16	0.245	770
	82	10×20	0.166	842
	100	10×20	0.149	1067
	120	13×21	0.127	1155
	150	13×25	0.099	1298
	180	13×25	0.108	1331
	220	13×25	0.106	1870
	220	16×20	0.073	1925
	270	13×35	0.065	2156
	270	16×26	0.057	2134
	330	13×30	0.056	2255
	330	16×26	0.064	2365

Rated Voltage(V)	CAP(μ F)	Size \varnothing DXL(mm)	ESR (Ω)	Ripple (mA)
100	470	16×35	0.035	3190
	470	18×30	0.037	3190
	560	18×40	0.032	3630
	680	18×35	0.032	3465
	820	18×40	0.029	3806
	1000	18×40	0.029	3839
	4.7	5×11	1.921	90
	15	6.3×12	0.922	270
	22	8×12	0.800	350
120	27	8×12	0.484	425
	33	8×12	0.484	436
	47	10×12	0.367	567
	56	8×20	0.254	691
	68	10×16	0.238	793
	82	10×20	0.161	867
	100	10×20	0.144	1099
	120	13×21	0.123	1190
	150	13×25	0.096	1337
	180	13×25	0.105	1371
120	220	13×25	0.102	1926
	220	16×20	0.070	1983
	270	13×35	0.063	2221
	270	16×26	0.055	2198
	330	13×30	0.054	2323
	330	16×26	0.062	2436
	470	16×35	0.034	3286
	470	18×30	0.036	3286
	560	18×40	0.031	3739
	680	18×35	0.031	3569
120	820	18×40	0.028	3920
	1000	18×40	0.028	3954



IT8 Series

+105°C, Load life: 8000-10000 hours.

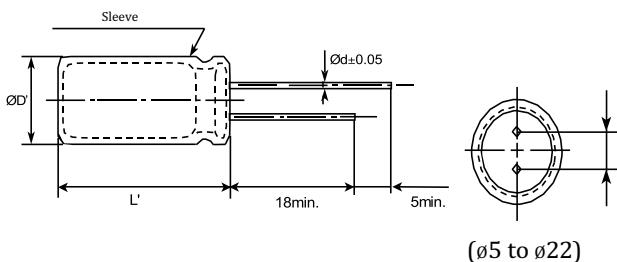
High frequency, low impedance, high ripple current.

RoHS Compliant.

SPECIFICATIONS

Items	Characteristics																														
Operating Temperature Range	-40~+105°C																														
Rated Voltage Range	10V~120Vdc																														
Capacitance Tolerance	± 20% (120Hz, +25°C)																														
Leakage Current	I≤0.01CV or 3μA, whichever is Lower.																														
	I:Max.leakage current (μA),N:Nominal capacitance (μF),V: Rated voltage (V) (at 25°C , after 3 minutes)																														
Dissipation Factor (tanδ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.																														
	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>120</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max.)</td> <td>0.22</td> <td>0.20</td> <td>0.16</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.09</td> </tr> </tbody> </table>	Rated Voltage)	10	16	25	35	50	63	80	100	120	Tanδ (max.)	0.22	0.20	0.16	0.16	0.14	0.12	0.10	0.10	0.09										
Rated Voltage)	10	16	25	35	50	63	80	100	120																						
Tanδ (max.)	0.22	0.20	0.16	0.16	0.14	0.12	0.10	0.10	0.09																						
Temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>120</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+25°C)</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(+25°C)</td> <td>6</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Rated Voltage	10	16	25	35	50	63	80	100	120	Z(-25°C)/Z(+25°C)	3	2	2	2	2	2	2	2	2	Z(-40°C)/Z(+25°C)	6	6	5	4	3	3	3	3	3
	Rated Voltage	10	16	25	35	50	63	80	100	120																					
Z(-25°C)/Z(+25°C)	3	2	2	2	2	2	2	2	2																						
Z(-40°C)/Z(+25°C)	6	6	5	4	3	3	3	3	3																						
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C :																														
	<table border="1"> <thead> <tr> <th>Capacitance Change</th> <th>±20% of the initial value</th> <th>ΦD</th> <th>Load life</th> </tr> </thead> <tbody> <tr> <td>D.F. (tanδ)</td> <td>≤200% of the initial specified value</td> <td>5~6.3</td> <td>8000h</td> </tr> <tr> <td>Leakage current</td> <td>≤The initial specified value</td> <td>>8</td> <td>10000h</td> </tr> </tbody> </table>	Capacitance Change	±20% of the initial value	ΦD	Load life	D.F. (tanδ)	≤200% of the initial specified value	5~6.3	8000h	Leakage current	≤The initial specified value	>8	10000h																		
Capacitance Change	±20% of the initial value	ΦD	Load life																												
D.F. (tanδ)	≤200% of the initial specified value	5~6.3	8000h																												
Leakage current	≤The initial specified value	>8	10000h																												
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1,000 hours at 105°C without voltage applied : Capacitance change : ±20% of the initial measured value D.F. (tanδ) change : ≤200% of the initial specified value Leakage current : ≤200% of the initial specified value																														

Size(mm)



ØD	5	6.3	8	10	12~13	16	18	22
Ød	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
ØD'	D<20 : ØD+0.5max. ; D≥20 : ØD+1.0max.							
L'	L'+2max.							

Frequency Coefficient

Rated Voltage(V)	Freq.(Hz)	CAP(μF)			
		120	1K	10K	100K
6.3~120	< 180	0.40	0.75	0.90	1.00
	220~560	0.50	0.85	0.94	1.00
	680~1800	0.60	0.87	0.95	1.00
	2200~3900	0.75	0.90	0.95	1.00
	≥4700	0.85	0.95	0.98	1.00

IT8 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(μ F)	Size \varnothing DXL(mm)	ESR (Ω)	Ripple (mA)
10	100	5×11	0.339	308
	180	6.3×12	0.240	380
	220	6.3×12	0.240	391
	270	6.3×12	0.266	402
	330	6.3×12	0.240	413
	330	8×12	0.240	435
	390	8×12	0.142	721
	470	6.3×12	0.127	424
	470	8×12	0.115	732
	560	8×12	0.109	754
	680	10×12	0.087	765
	820	8×16	0.094	930
	820	10×12	0.087	985
	1000	8×16	0.091	985
	1200	10×16	0.036	1430
	1200	10×20	0.050	1540
	1500	10×16	0.065	1485
	1500	10×20	0.050	1595
	1800	10×20	0.050	1650
	2200	10×20	0.056	1815
	2200	13×21	0.039	2090
	2700	10×25	0.051	1925
	2700	13×21	0.042	2145
	3300	10×25	0.042	2338
	3300	16×20	0.039	2552
	3900	16×20	0.039	2805
	4700	13×25	0.033	2393
	4700	16×20	0.036	2613
5600	16×26	0.030	2816	
5600	18×20	0.038	2827	
6800	18×25	0.027	3058	
16	22	5×11	0.787	132
	47	5×11	0.545	143
	100	5×11	0.315	220
	220	8×12	0.142	732
	330	8×12	0.127	754
	470	8×12	0.113	792
	560	8×14	0.097	880
	680	8×16	0.094	930

Rated Voltage(V)	CAP(μ F)	Size \varnothing DXL(mm)	ESR(Ω)	Ripple (mA)	
16	820	8×16	0.073	968	
	1000	8×20	0.079	1051	
	1000	10×16	0.079	1210	
	1500	10×20	0.056	1595	
	2200	10×25	0.041	2035	
	2200	13×25	0.033	2343	
	3300	13×30	0.028	2673	
	3300	18×20	0.029	2750	
	4700	16×30	0.024	3339	
	4700	18×25	0.027	3416	
	5600	18×30	0.022	3971	
	6800	18×36	0.019	4125	
	25	22	5×11	1.331	138
		82	6.3×12	0.242	380
		100	6.3×12	0.230	385
		220	8×12	0.142	754
		220	8×16	0.121	902
		330	8×14	0.094	787
330		10×12	0.087	974	
470		8×20	0.082	1089	
470		10×16	0.082	1155	
560		8×20	0.079	1276	
560		10×16	0.073	1331	
680		10×16	0.073	1375	
680		10×20	0.050	1546	
820		10×20	0.046	1595	
1000		10×20	0.039	2002	
1000		13×21	0.039	2096	
1500		10×25	0.051	2178	
2200		13×21	0.036	2448	
2200		18×20	0.033	2756	
3300		16×30	0.024	3339	
3300		18×25	0.027	3355	
35		4700	18×35	0.021	4059
	4700	18×40	0.019	4125	
	5600	18×40	0.017	4169	
	22	5×11	0.787	198	
	33	6.3×12	0.448	264	
	47	6.3×12	0.436	380	
	56	6.3×12	0.424	391	
	68	6.3×12	0.411	402	
	100	8×12	0.185	721	
	220	8×16	0.123	765	
	220	10×12	0.087	974	
	330	8×20	0.083	1155	
	470	10×16	0.058	1540	
	470	13×13	0.058	1595	
	560	10×20	0.054	1722	
	680	10×20	0.056	1854	
	680	13×21	0.052	2096	
	820	10×25	0.051	1815	
	820	13×21	0.051	2162	
	1000	13×21	0.050	2217	
	1000	13×25	0.042	2453	
	1500	13×35	0.024	3025	
1500	16×26	0.030	2816		
2200	16×26	0.034	2893		
2200	18×25	0.027	3058		
3300	18×35	0.021	4065		
50	1	5×11	3.509	88	
	2.2	5×11	3.025	99	
	3.3	5×11	2.420	110	
	4.7	5×11	2.057	116	
	10	5×11	2.057	127	
	22	5×11	1.452	176	
	22	6.3×12	0.436	242	
	33	6.3×12	0.327	330	
	47	6.3×12	0.303	352	
	56	8×12	0.194	616	
	68	8×12	0.185	633	

IT8 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(μ F)	Size \varnothing DXL(mm)	ESR (Ω)	Ripple (mA)
50	100	8×12	0.185	792
	100	10×12	0.136	828
	220	10×16	0.103	1045
	220	10×20	0.087	1265
	330	10×20	0.052	1397
	330	13×21	0.050	1832
	470	10×20	0.067	1485
	470	13×25	0.038	2151
	560	13×25	0.038	2217
	680	13×30	0.033	2552
	680	16×20	0.038	2585
	820	13×35	0.028	2772
	820	18×20	0.039	2750
	1000	13×25	0.039	2475
	1000	13×35	0.036	2811
	1500	16×35	0.021	3476
	1800	16×40	0.021	3960
	1800	18×30	0.023	3850
2200	18×30	0.023	3905	
2200	18×35	0.019	4059	
63	22	6.3×12	1.162	286
	33	6.3×12	1.041	330
	47	8×12	0.526	528
	56	8×12	0.520	572
	68	8×12	0.508	605
	100	8×16	0.363	858
	100	10×12	0.399	869
	120	10×16	0.300	935
	150	8×20	0.288	1155
	180	10×20	0.183	1309
	180	13×16	0.201	1298
	220	10×25	0.183	1540
	220	13×21	0.163	1705
	330	10×25	0.131	1727
	330	13×21	0.139	1815
	470	13×21	0.091	1892
	470	13×25	0.087	2200
	560	16×26	0.063	2585
	680	13×35	0.071	2992
	680	16×26	0.063	2970
	820	13×40	0.062	3036
	820	16×30	0.047	3036
	1000	16×30	0.047	3064
	1000	16×35	0.039	3245
1500	18×35	0.035	4125	

Rated Voltage(V)	CAP(μ F)	Size \varnothing DXL(mm)	ESR (Ω)	Ripple (mA)
100	4.7	5×11	2.178	95
	15	6.3×12	1.045	280
	22	8×12	0.950	407
	27	8×12	0.950	413
	33	8×14	0.549	424
	47	10×12	0.416	550
	56	10×17	0.288	671
	68	10×16	0.270	770
	82	10×20	0.183	842
	100	10×20	0.163	1067
	120	13×21	0.139	1155
	150	13×25	0.109	1298
	180	13×25	0.119	1331
	220	13×25	0.116	1870
	220	16×20	0.080	1925
	270	13×35	0.071	2156
	270	16×26	0.063	2134
	330	13×30	0.062	2255
	330	16×26	0.070	2365
	470	16×35	0.039	3190
470	18×30	0.041	3190	
560	18×40	0.035	3630	
680	18×35	0.035	3465	
820	18×40	0.031	3806	
1000	18×40	0.031	3839	
120	4.7	5×11	2.091	98
	15	6.3×12	1.004	290
	22	8×12	0.871	419
	27	8×12	0.527	425
	33	8×14	0.527	436
	47	10×12	0.400	567
	56	10×17	0.276	691
	68	10×16	0.259	793
	82	10×20	0.175	867
	100	10×20	0.157	1099
	120	13×21	0.134	1190
	150	13×25	0.105	1337
	180	13×25	0.114	1371
	220	13×25	0.112	1926
	220	16×20	0.077	1983
	270	13×35	0.069	2221
	270	16×26	0.060	2198
	330	13×30	0.059	2323
	330	16×26	0.067	2436
	470	16×35	0.037	3286
	470	18×30	0.039	3286
	560	18×40	0.034	3739
	680	18×35	0.034	3569
	820	18×40	0.030	3920
1000	18×40	0.030	3954	

IT10 Series



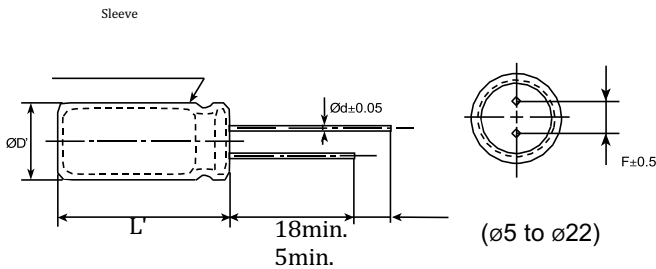
+105°C, Load life: 8000~10000hours.

Used in LED Lighting, electronic ballast, electronic energy saving lamp, for power supply applications, etc.RoHS Compliant.

SPECIFICATIONS

Items	Characteristics																																	
Operating Temperature Range	-40~+105°C																																	
Rated Voltage Range	6.3V~120Vdc 160V~500Vdc																																	
Capacitance Tolerance	± 20% (120Hz, +25°C)																																	
Leakage Current	I≤0.01CV or 3μA, whichever is Lower. I≤0.03CV+10μA I:Max.leakage current (μA),Nominal capacitance (μF),V: Rated voltage (V) (at 25°C, after 3 minutes)																																	
Dissipation Factor (tanδ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase. <table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100~120</th> <th>160~500</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max.)</td> <td>0.22</td> <td>0.20</td> <td>0.16</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.20</td> </tr> </tbody> </table>	Rated Voltage)	10	16	25	35	50	63	80	100~120	160~500	Tanδ (max.)	0.22	0.20	0.16	0.16	0.14	0.12	0.10	0.10	0.20													
Rated Voltage)	10	16	25	35	50	63	80	100~120	160~500																									
Tanδ (max.)	0.22	0.20	0.16	0.16	0.14	0.12	0.10	0.10	0.20																									
Temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100~120</th> <th>160~250</th> <th>350~500</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+25°C)</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z(-40°C)/Z(+25°C)</td> <td>8</td> <td>8</td> <td>6</td> <td>5</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>6</td> <td>10</td> </tr> </tbody> </table>	Rated Voltage	10	16	25	35	50	63	80	100~120	160~250	350~500	Z(-25°C)/Z(+25°C)	4	3	3	3	3	3	3	3	3	6	Z(-40°C)/Z(+25°C)	8	8	6	5	4	4	4	4	6	10
Rated Voltage	10	16	25	35	50	63	80	100~120	160~250	350~500																								
Z(-25°C)/Z(+25°C)	4	3	3	3	3	3	3	3	3	6																								
Z(-40°C)/Z(+25°C)	8	8	6	5	4	4	4	4	6	10																								
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C : <table border="1"> <thead> <tr> <th>Capacitance Change</th> <th>±20% of the initial value</th> <th>ΦD</th> <th>Load life</th> </tr> </thead> <tbody> <tr> <td>D.F. (tanδ)</td> <td>≤200% of the initial specified value</td> <td>5~6.3 (h≤9mm)</td> <td>8000h</td> </tr> <tr> <td>Leakage Current</td> <td>≤The initial specified value</td> <td>Φ≥8h≥10</td> <td>8000h~10000h</td> </tr> </tbody> </table>	Capacitance Change	±20% of the initial value	ΦD	Load life	D.F. (tanδ)	≤200% of the initial specified value	5~6.3 (h≤9mm)	8000h	Leakage Current	≤The initial specified value	Φ≥8h≥10	8000h~10000h																					
Capacitance Change	±20% of the initial value	ΦD	Load life																															
D.F. (tanδ)	≤200% of the initial specified value	5~6.3 (h≤9mm)	8000h																															
Leakage Current	≤The initial specified value	Φ≥8h≥10	8000h~10000h																															
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1,000 hours at 105°C without voltage applied : Capacitance change : ±20% of the initial measured value Dissipation factor : ≤200% of the initial specified value Leakage current : ≤200% of the initial specified value																																	

Size(mm)



Frequency Coefficient

Rated Voltage(V)	Freq.(Hz)	120	1K	10K	100K
	CAP(μF)				
6.3~120	<180	0.40	0.75	0.90	1.00
	220~560	0.50	0.85	0.94	1.00
	680~1800	0.60	0.87	0.95	1.00
	2200~3900	0.75	0.90	0.95	1.00
	≥4700	0.85	0.95	0.98	1.00
160~500	-	0.50	0.70	0.80	1.00

ØD	5	6.3	8	10	12~13	16	18	22
Ød	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
ØD'	D<20 : ØD+0.5max. ; D≥20 : ØD+1.0max.							
L'	L+2max.							

IT10 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
10	47	5×11	69
	100	5×11	104
	220	6.3×9	173
	220	6.3×12	196
	330	6.3×9	219
	330	8×12	230
	470	8×12	253
	680	8×12	288
	680	8×16	299
	1000	8×16	460
	1000	10×12	472
	1000	10×14	495
16	1000	10×16	518
	47	5×11	69
	100	5×11	115
	100	6.3×12	127
	220	6.3×12	173
	220	8×12	182
	330	8×12	253
	470	8×12	299
	470	10×12	322
	680	8×16	437
	680	10×17	460
	820	10×14	575
25	1000	10×17	633
	2200	13×21	920
	1	5×11	23
	2.2	5×11	35
	4.7	5×11	46
	10	5×11	69
	47	5×11	92
	68	5×11	127
	100	6.3×12	150
	100	8×12	161
	220	8×9	230
	220	8×12	242
35	330	8×16	270
	390	8×16	299
	390	10×12	316
	390	10×14	322
	470	8×16	368
	470	8×20	380
	470	10×12	374
	470	10×17	380
	680	10×17	403
	820	10×17	518
	1000	10×20	621
	1500	13×25	748
50	1800	13×21	920
	1800	13×25	943
	2200	16×26	1012
	1	5×11	23
	2.2	5×11	29
	3.3	5×11	40
	4.7	5×11	48
	6.8	5×11	63
	10	5×9	69
	10	5×11	75
	15	5×11	81
	22	5×11	92
63	33	5×11	104
	47	5×11	115
	47	6.3×12	121
	68	6.3×12	127
	82	8×12	144

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
35	100	6.3×12	155
	100	8×12	161
	180	8×12	219
	180	10×12	230
	220	8×12	253
	220	8×16	259
	220	10×12	270
	220	10×16	276
	330	8×20	345
	330	10×12	345
	330	10×17	380
	470	10×17	460
50	470	10×20	518
	560	10×17	598
	680	10×20	633
	680	13×21	667
	1000	10×25	955
	1000	13×21	1012
	1500	13×21	1093
	0.47	5×11	12
	1	5×11	17
	2.2	5×11	21
	3.3	5×11	25
	4.7	5×11	32
6.8	5×11	46	
10	5×9	69	
10	5×11	75	
22	5×11	98	
33	6.3×12	109	
47	6.3×12	127	
47	8×12	132	
56	6.3×12	138	
56	8×12	140	
68	8×12	144	
100	8×12	161	
100	10×12	173	
150	8×16	242	
150	10×12	251	
180	8×20	265	
180	10×17	282	
220	8×20	322	
220	10×12	328	
220	10×17	322	
220	10×20	334	
270	10×17	380	
270	10×20	391	
330	10×17	446	
330	10×20	454	
330	13×21	460	
330	13×21	472	
470	10×20	495	
470	13×21	523	
470	13×25	529	
680	13×21	690	
680	13×25	748	
820	16×22	920	
1000	13×25	1035	
1000	16×26	1150	
2200	18×32	2070	
63	2.2	5×11	35
	2.7	5×11	40
	4.7	5×11	46
	10	5×9	58
	10	5×11	63
	10	6.3×12	69
	22	6.3×12	109
	33	6.3×12	144
	33	8×12	150
	47	8×12	207
	68	8×12	242

IT10 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
63	68	10×12	253
	82	8×12	288
	82	10×12	293
	100	8×12	299
	100	8×16	328
	100	10×12	334
	100	10×17	345
	120	10×12	357
	120	10×17	368
	150	8×16	403
	150	10×12	412
	150	10×14	416
	150	10×17	420
	180	10×17	437
	220	10×17	518
	220	10×20	523
	270	10×20	598
	330	10×20	748
	330	13×21	730
	330	13×25	759
470	13×21	874	
470	13×25	897	
680	13×25	1093	
680	16×26	1127	
1000	16×26	1495	
1000	18×27	1610	
80	1.0	5×11	17
	3.3	5×11	35
	3.3	6.3×12	40
	4.7	8×12	52
	6.8	5×11	58
	10	5×11	69
	22	6.3×12	115
	22	8×12	121
	33	6.3×12	161
	47	8×12	213
	47	8×14	219
	56	8×12	230
	56	10×12	242
	68	8×14	253
	68	8×16	265
	68	10×12	270
	68	10×16	276
	82	8×16	293
	82	10×17	299
	100	8×16	328
	100	10×12	334
	100	10×14	334
	100	10×16	345
	120	10×17	247
	120	10×20	368
	150	10×17	397
	150	10×20	408
	180	10×20	449
	220	10×20	529
	220	10×25	541
	220	13×21	541
	330	13×21	713
	330	13×25	730
	470	16×26	863
	680	18×27	1035

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
100	1	5×11	23
	2.2	5×11	35
	2.2	6.3×12	40
	2.7	5×11	46
	3.3	5×11	58
	3.3	6.3×12	62
	3.9	5×11	63
	4.7	5×11	69
	4.7	8×12	75
	5.6	5×11	78
	6.8	5×11	86
	8.2	6.3×12	98
	10	5×11	109
	10	6.3×12	115
	10	8×12	121
	15	6.3×12	138
	15	8×12	144
	22	6.3×12	196
	22	8×12	201
	22	10×12	207
	27	8×12	224
	33	8×12	253
	33	8×14	265
	33	8×16	282
	33	10×12	288
	47	8×12	299
	47	8×14	305
	47	8×16	313
	47	10×12	322
	56	8×16	345
	56	10×14	357
	56	10×17	368
	68	8×16	380
	68	8×20	391
	68	10×12	397
	68	10×17	408
	82	8×20	437
	82	10×14	460
	82	10×20	483
	100	8×25	529
100	10×17	541	
100	10×20	552	
120	10×20	598	
150	10×20	690	
150	13×21	748	
220	13×21	920	
220	13×25	932	
220	16×22	943	
270	13×25	989	
330	13×25	1093	
330	18×22	1127	
470	16×32	1265	
560	18×32	1495	
120	22	10×12	173
	33	10×12	282
	47	10×14	345
	47	10×17	362
	56	10×17	368
	68	10×20	374
	100	13×17	472
	120	13×21	541
	120	13×25	552
	150	13×25	713
	180	16×22	805
	220	16×26	880

IT10 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
160	2.2	5×11	59
	3.3	5×11	69
	3.9	6.3×12	75
	4.7	6.3×12	78
	4.7	8×12	83
	5.6	8×12	87
	6.8	6.3×12	97
	6.8	8×12	106
	8.2	8×12	173
	10	8×12	236
	10	10×12	219
	15	8×16	265
	15	10×17	288
	22	8×12	345
	22	8×16	385
	22	10×17	437
	33	8×20	460
	33	10×17	483
	47	10×20	575
	47	12×18	587
47	13×21	633	
56	10×25	621	
56	13×18	621	
68	13×21	656	
68	13×25	748	
82	10×25	797	
82	13×21	805	
100	13×21	799	
100	13×25	817	
120	13×25	863	
150	16×26	978	
200	1	5×11	38
	2.2	5×11	69
	2.2	6.3×12	72
	3.3	6.3×12	84
	3.3	8×12	92
	4.7	6.3×12	98
	4.7	8×12	104
	5.6	6.3×12	104
	5.6	8×9	106
	5.6	8×12	117
	6.8	8×12	124
	6.8	8×16	127
	6.8	10×12	127
	8.2	8×12	168
	8.2	8×16	173
	8.2	10×12	173
	10	8×12	213
	10	8×14	230
	10	8×16	265
	10	10×12	265
	10	10×17	276
	12	8×16	276
	12	10×12	276
	12	10×17	282
	15	8×20	288
	15	10×12	288
	15	10×16	299
	18	8×20	334
	18	10×17	403
	18	10×20	414
	22	10×17	460
	22	10×20	483
	33	13×17	512
	33	13×21	552
	47	13×21	690
	47	13×21	759
	47	13×25	771
	68	13×25	805
	100	13×25	840

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)	
250	1.0	6.3×9	46	
	2.2	6.3×9	72	
	2.2	6.3×12	81	
	3.3	6.3×9	86	
	3.3	6.3×12	95	
	3.3	8×12	104	
	3.9	6.3×9	92	
	4.7	6.3×12	106	
	4.7	8×12	117	
	5.6	6.3×12	109	
	5.6	8×12	121	
	6.8	8×12	127	
	6.8	8×16	138	
	8.2	8×12	144	
	8.2	8×16	155	
	10	8×12	230	
	10	8×13	230	
	10	8×14	236	
	10	8×16	242	
	10	10×12	242	
	10	10×17	247	
	12	8×14	242	
	12	8×16	247	
	15	8×16	288	
	15	8×20	311	
	15	10×17	345	
	22	10×17	460	
	22	10×20	477	
	22	13×21	506	
	27	10×20	518	
	33	10×20	541	
	33	13×21	575	
	33	13×21	587	
	33	13×25	598	
	47	13×21	713	
	68	16×26	897	
	0.68	6.3×12	58	
	400	1	6.3×9	63
		1	6.3×12	69
		1.2	6.3×12	71
1.2		8×12	78	
1.5		6.3×12	81	
1.5		8×12	84	
1.8		6.3×12	86	
1.8		8×12	92	
2.2		6.3×9	81	
2.2		6.3×12	90	
2.2		8×9	90	
2.2		8×12	98	
3.3		6.3×12	98	
3.3		8×9	104	
3.3		8×12	108	
4.7		8×9	127	
4.7		8×12	133	
4.7		10×12	138	
5.6		8×12	147	
5.6		8×16	161	
5.6	10×12	161		
6.8	8×14	173		
6.8	8×16	173		

IT10 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
400	6.8	10×12	184
	6.8	10×17	184
	8.2	10×14	242
	8.2	10×17	251
	10	10×12	265
	10	10×14	270
	10	10×17	282
	10	10×20	293
	12	10×20	305
	15	10×17	305
	15	10×20	316
	15	13×17	339
	15	13×21	357
	18	10×20	322
	18	13×21	380
	22	10×20	334
	22	10×25	368
	22	13×25	495
	22	13×21	483
	33	13×21	535
	33	13×25	564
	33	16×26	679
	47	16×22	713
	47	16×26	736
	56	16×26	759
	68	18×27	863
82	18×32	943	
100	18×36	1093	
450	1	6.3×12	69
	1	8×12	75
	2.2	8×12	86
	3.3	8×13	92
	4.7	8×14	104
	4.7	10×12	109
	4.7	10×17	115
	5.6	10×12	123
	6.8	10×12	150
	6.8	10×14	161
	6.8	10×17	190
	8.2	10×17	236
	8.2	10×20	253
	10	10×20	288
	15	10×20	345
	15	13×25	414
	22	13×21	414
	22	13×25	518
	33	18×22	598
	47	16×26	713
	47	18×27	748
	68	18×27	863
	68	18×32	863
	82	18×32	978
	100	18×36	1035
	150	22×40	1127

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
500	10	13×20	288
	10	13×25	302
	15	13×25	396
	15	16×20	396
	22	16×25	504
	33	18×25	630
	47	18×30	792
	56	18×30	860
	68	18×35	1000

IT115 Series



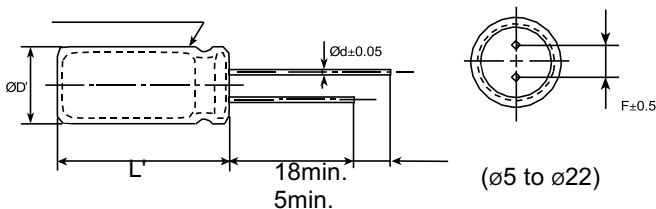
+115°C, Load life: 4000~5000hours.

Used in LED Lighting, electronic ballast, electronic energy saving lamp, for power supply applications, etc. RoHS Compliant.

SPECIFICATIONS

Items	Characteristics																			
Operating Temperature Range	-40~+115°C																			
Rated Voltage Range	6.3V~120Vdc 160V~500Vdc																			
Capacitance Tolerance	± 20% (120Hz, +25°C)																			
Leakage Current	I≤0.01CV or 3μA, whichever is Lower.																			
	I≤0.03CV+10μA I:Max.leakage current (μA),Nominal capacitance (μF),V: Rated voltage (V) (at 25°C , after 3 minutes)																			
Dissipation Factor (tanδ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.																			
	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100~120</th> <th>160~500</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max.)</td> <td>0.22</td> <td>0.20</td> <td>0.16</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.20</td> </tr> </tbody> </table>	Rated Voltage)	10	16	25	35	50	63	80	100~120	160~500	Tanδ (max.)	0.22	0.20	0.16	0.16	0.14	0.12	0.10	0.10
Rated Voltage)	10	16	25	35	50	63	80	100~120	160~500											
Tanδ (max.)	0.22	0.20	0.16	0.16	0.14	0.12	0.10	0.10	0.20											
Temperature characteristics (Impedance ratio at 120Hz)	Rated Voltage (V)	10	16	25	35	50	63	80	100~120	160~250	350~500									
	Z(-25°C)/Z(+25°C)	4	3	3	3	3	3	3	3	3	6									
	Z(-40°C)/Z(+25°C)	8	8	6	5	4	4	4	4	6	10									
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 115°C :																			
	Capacitance Change	±20% of the initial value						ΦD	Load life											
	D.F. (tanδ)	≤200% of the initial specified value						5~6.3	4000h											
	Leakage Current	≤The initial specified value						Φ≥8	5000h											
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1,000 hours at 115°C without voltage applied :																			
	Capacitance change : ±20% of the initial measured value																			
	Dissipation factor : ≤200% of the initial specified value																			
	Leakage current : ≤200% of the initial specified value																			

Size(mm)



Frequency Coefficient

Rated Voltage(V)	Freq.(Hz)				
	CAP(μF)	120	1K	10K	100K
6.3~120	<180	0.40	0.75	0.90	1.00
	220~560	0.50	0.85	0.94	1.00
	680~1800	0.60	0.87	0.95	1.00
	2200~3900	0.75	0.90	0.95	1.00
	≥4700	0.85	0.95	0.98	1.00
160~500	-	0.50	0.70	0.80	1.00

ØD	5	6.3	8	10	12~13	16	18	22
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	7.5	7.5	10.0
ØD'	D<20 : ØD+0.5max. ; D≥20 : ØD+1.0max.							
L'	L+2max.							

IT115 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C, 115°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA,105°C)	Ripple (mA,115°C)
10	47	5×11	69	60
	100	5×11	104	90
	220	6.3×9	173	150
	220	6.3×12	196	170
	330	6.3×9	219	190
	330	8×12	230	200
	470	8×12	253	220
	680	8×12	288	250
	680	8×16	299	260
	1000	8×16	460	400
	1000	10×12	472	410
	1000	10×14	495	430
1000	10×16	518	450	
16	47	5×11	69	60
	100	5×11	115	100
	100	6.3×12	127	110
	220	6.3×12	173	150
	220	8×12	182	158
	330	8×12	253	220
	470	8×12	299	260
	470	10×12	322	280
	680	8×16	437	380
	680	10×17	460	400
	820	10×14	575	500
	1000	10×17	633	550
2200	13×21	920	800	
25	1	5×11	23	20
	2.2	5×11	35	30
	4.7	5×11	46	40
	10	5×11	69	60
	47	5×11	92	80
	68	5×11	127	110
	100	6.3×12	150	130
	100	8×12	161	140
	220	8×9	230	200
	220	8×12	242	210
	330	8×16	270	235
	390	8×16	299	260
	390	10×12	316	275
	390	10×14	322	280
	470	8×16	368	320
	470	8×20	380	330
	470	10×12	374	325
	470	10×17	380	330
	680	10×17	403	350
	820	10×17	518	450
1000	10×20	621	540	
1500	13×25	748	650	
1800	13×21	920	800	
1800	13×25	943	820	
2200	16×26	1012	880	
35	1	5×11	23	20
	2.2	5×11	29	25
	3.3	5×11	40	35
	4.7	5×11	48	42
	6.8	5×11	63	55
	10	5×9	69	60
	10	5×11	75	65
	15	5×11	81	70
	22	5×11	92	80
	33	5×11	104	90
	47	5×11	115	100
	47	6.3×12	121	105
	68	6.3×12	127	110
	82	8×12	144	125
	100	6.3×12	155	135
	100	8×12	161	140
	180	8×12	219	190
	180	10×12	230	200

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA, 105°C)	Ripple (mA,115°C)
35	220	8×12	253	220
	220	8×16	259	225
	220	10×12	270	235
	220	10×16	276	240
	330	8×20	345	300
	330	10×12	345	300
	330	10×17	380	330
	470	10×17	460	400
	470	10×20	518	450
	560	10×17	598	520
	680	10×20	633	550
	680	13×21	667	580
	1000	10×25	955	830
	1000	13×21	1012	880
	1500	13×21	1093	950
50	0.47	5×11	12	10
	1	5×11	17	15
	2.2	5×11	21	18
	3.3	5×11	25	22
	4.7	5×11	32	28
	6.8	5×11	46	40
	10	5×9	69	60
	10	5×11	75	65
	22	5×11	98	85
	33	6.3×12	109	95
	47	6.3×12	127	110
	47	8×12	132	115
	56	6.3×12	138	120
	56	8×12	140	122
	68	8×12	144	125
	100	8×12	161	140
	100	10×12	173	150
	150	8×16	242	210
	150	10×12	251	218
	180	8×20	265	230
	180	10×17	282	245
	220	8×20	322	280
	220	10×12	328	285
	220	10×17	322	280
	220	10×20	334	290
270	10×17	380	330	
270	10×20	391	340	
330	10×17	446	388	
330	10×20	454	395	
330	13×21	460	400	
330	13×21	472	410	
470	10×20	495	430	
470	13×21	523	455	
470	13×25	529	460	
680	13×21	690	600	
680	13×25	748	650	
820	16×22	920	800	
1000	13×25	1035	900	
1000	16×26	1150	1000	
2200	18×32	2070	1800	
63	2.2	5×11	35	30
	2.7	5×11	40	35
	4.7	5×11	46	40
	10	5×9	58	50
	10	5×11	63	55
	10	6.3×12	69	60
	22	6.3×12	109	95
	33	6.3×12	144	125
	33	8×12	150	130
	47	8×12	207	180
	68	8×12	242	210
	68	10×12	253	220
	82	8×12	288	250
	82	10×12	293	255
	100	8×12	299	260
	100	8×16	328	285
	100	10×12	334	290
	100	10×17	345	300
	120	10×12	357	310

IT115 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C, 115°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA,105°C)	Ripple (mA,115°C)
63	120	10×17	368	320
	150	8×16	403	350
	150	10×12	412	358
	150	10×14	416	362
	150	10×17	420	365
	180	10×17	437	380
	220	10×17	518	450
	220	10×20	523	455
	270	10×20	598	520
	330	10×20	748	650
	330	13×21	730	635
	330	13×25	759	660
	470	13×21	874	760
	470	13×25	897	780
	680	13×25	1093	950
	680	16×26	1127	980
1000	16×26	1495	1300	
1000	18×27	1610	1400	
80	1.0	5×11	17	15
	3.3	5×11	35	30
	3.3	6.3×12	40	35
	4.7	8×12	52	45
	6.8	5×11	58	50
	10	5×11	69	60
	22	6.3×12	115	100
	22	8×12	121	105
	33	6.3×12	161	140
	47	8×12	213	185
	47	8×14	219	190
	56	8×12	230	200
	56	10×12	242	210
	68	8×14	253	220
	68	8×16	265	230
	68	10×12	270	235
	68	10×16	276	240
	82	8×16	293	255
	82	10×17	299	260
	100	8×16	328	285
	100	10×12	334	290
	100	10×14	334	290
	100	10×16	345	300
	120	10×17	247	215
	120	10×20	368	320
	150	10×17	397	345
	150	10×20	408	355
	180	10×20	449	390
220	10×20	529	460	
220	10×25	541	470	
220	13×21	541	470	
330	13×21	713	620	
330	13×25	730	635	
470	16×26	863	750	
680	18×27	1035	900	
100	1	5×11	23	20
	2.2	5×11	35	30
	2.2	6.3×12	40	35
	2.7	5×11	46	40
	3.3	5×11	58	50
	3.3	6.3×12	62	54
	3.9	5×11	63	55
	4.7	5×11	69	60
	4.7	8×12	75	65
	5.6	5×11	78	68
	6.8	5×11	86	75
	8.2	6.3×12	98	85
	10	5×11	109	95
	10	6.3×12	115	100
	10	8×12	121	105
	15	6.3×12	138	120
	15	8×12	144	125
	22	6.3×12	196	170
	22	8×12	201	175
	22	10×12	207	180

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA, 105°C)	Ripple (mA,115°C)	
100	27	8×12	224	195	
	33	8×12	253	220	
	33	8×14	265	230	
	33	8×16	282	245	
	33	10×12	288	250	
	47	8×12	299	260	
	47	8×14	305	265	
	47	8×16	313	272	
	47	10×12	322	280	
	56	8×16	345	300	
	56	10×14	357	310	
	56	10×17	368	320	
	68	8×16	380	330	
	68	8×20	391	340	
	68	10×12	397	345	
	68	10×17	408	355	
	82	8×20	437	380	
	82	10×14	460	400	
	82	10×20	483	420	
	100	8×25	529	460	
	100	10×17	541	470	
	100	10×20	552	480	
	120	10×20	598	520	
	150	10×20	690	600	
	150	13×21	748	650	
	220	13×21	920	800	
	220	13×25	932	810	
	220	16×22	943	820	
	270	13×25	989	860	
	330	13×25	1093	950	
	330	18×22	1127	980	
	470	16×32	1265	1100	
560	18×32	1495	1300		
120	22	10×12	173	150	
	33	10×12	282	245	
	47	10×14	345	300	
	47	10×17	362	315	
	56	10×17	368	320	
	68	10×20	374	325	
	100	13×17	472	410	
	120	13×21	541	470	
	120	13×25	552	480	
	150	13×25	713	620	
	180	16×22	805	700	
	220	16×26	880	765	
	160	2.2	5×11	59	51
		3.3	5×11	69	60
		3.9	6.3×12	75	65
		4.7	6.3×12	78	68
4.7		8×12	83	72	
5.6		8×12	87	76	
6.8		6.3×12	97	84	
6.8		8×12	106	92	
8.2		8×12	173	150	
10		8×12	236	205	
10		10×12	219	190	
15		8×16	265	230	
15		10×17	288	250	
22		8×12	345	300	
22		8×16	385	335	
22		10×17	437	380	
33		8×20	460	400	
33		10×17	483	420	
47		10×20	575	500	
47		12×18	587	510	
47	13×21	633	550		
56	10×25	621	540		

IT115 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C, 115°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA, 105°C)	Ripple (mA, 115°C)
160	56	13×18	621	540
	68	13×21	656	570
	68	13×25	748	650
	82	10×25	797	693
	82	13×21	805	700
	100	13×21	799	695
	100	13×25	817	710
	120	13×25	863	750
150	16×26	978	850	
200	1	5×11	38	33
	2.2	5×11	69	60
	2.2	6.3×12	72	63
	3.3	6.3×12	84	73
	3.3	8×12	92	80
	4.7	6.3×12	98	85
	4.7	8×12	104	90
	5.6	6.3×12	104	90
	5.6	8×9	106	92
	5.6	8×12	117	102
	6.8	8×12	124	108
	6.8	8×16	127	110
	6.8	10×12	127	110
	8.2	8×12	168	146
	8.2	8×16	173	150
	8.2	10×12	173	150
	10	8×12	213	185
	10	8×14	230	200
	10	8×16	265	230
	10	10×12	265	230
	10	10×17	276	240
	12	8×16	276	240
	12	10×12	276	240
	12	10×17	282	245
	15	8×20	288	250
	15	10×12	288	250
	15	10×16	299	260
	18	8×20	334	290
	18	10×17	403	350
	18	10×20	414	360
	22	10×17	460	400
	22	10×20	483	420
33	10×20	512	445	
33	13×17	512	445	
33	13×21	552	480	
47	13×21	690	600	
47	13×21	759	660	
47	13×25	771	670	
68	13×25	805	700	
100	13×25	840	730	
250	1.0	6.3×9	46	40
	2.2	6.3×9	72	63
	2.2	6.3×12	81	70
	3.3	6.3×9	86	75
	3.3	6.3×12	95	83
	3.3	8×12	104	90
	3.9	6.3×9	92	80
	4.7	6.3×12	106	92
	4.7	8×12	117	102
	5.6	6.3×12	109	95
	5.6	8×12	121	105
	6.8	8×12	127	110
	6.8	8×16	138	120
	8.2	8×12	144	125
	8.2	8×16	155	135
	10	8×12	230	200
	15	8×20	311	270
	15	10×17	345	300
	22	10×17	460	400
	22	10×20	477	415
	22	13×21	506	440
	27	10×20	518	450

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA, 105°C)	Ripple (mA, 115°C)
250	33	10×20	541	470
	33	13×21	575	500
	33	13×21	587	510
	33	13×25	598	520
	47	13×21	713	620
	68	16×26	897	780
	0.68	6.3×12	58	50
	1	6.3×9	63	55
1	6.3×12	69	60	
1.2	6.3×12	71	62	
1.2	8×12	78	68	
1.5	6.3×12	81	70	
1.5	8×12	84	73	
1.8	6.3×12	86	75	
1.8	8×12	92	80	
2.2	6.3×9	81	70	
2.2	6.3×12	90	78	
2.2	8×9	90	78	
2.2	8×12	98	85	
3.3	6.3×12	98	85	
3.3	8×9	104	90	
3.3	8×12	108	94	
4.7	8×9	127	110	
4.7	8×12	133	116	
4.7	10×12	138	120	
5.6	8×12	147	128	
5.6	8×16	161	140	
5.6	10×12	161	140	
6.8	8×14	173	150	
6.8	8×16	173	150	
6.8	10×12	184	160	
6.8	10×17	184	160	
8.2	10×14	242	210	
8.2	10×17	251	218	
10	10×12	265	230	
10	10×14	270	235	
10	10×17	282	245	
10	10×20	293	255	
12	10×20	305	265	
15	10×17	305	265	
15	10×20	316	275	
15	13×17	339	295	
15	13×21	357	310	
18	10×20	322	280	
18	13×21	380	330	
22	10×20	334	290	
22	10×25	368	320	
22	13×25	495	430	
22	13×21	483	420	
33	13×21	535	465	
33	13×25	564	490	
33	16×26	679	590	
47	16×22	713	620	
47	16×26	736	640	
56	16×26	759	660	
68	18×27	863	750	
82	18×32	943	820	
100	18×36	1093	950	
450	1	6.3×12	69	60
	1	8×12	75	65
	2.2	8×12	86	75
	3.3	8×13	92	80
	4.7	8×14	104	90
	4.7	10×12	109	95
	4.7	10×17	115	100
	5.6	10×12	123	107
	6.8	10×12	150	130
	6.8	10×14	161	140
	6.8	10×17	190	165
	8.2	10×17	236	205
	8.2	10×20	253	220
	10	10×20	288	250
	15	10×20	345	300

IT115 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C, 115°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA, 105°C)	Ripple (mA, 115°C)
450	15	13×25	414	360
	22	13×21	414	360
	22	13×25	518	450
	33	18×22	598	520
	47	16×26	713	620
	47	18×27	748	650
	68	18×27	863	750
	68	18×32	863	750
	82	18×32	978	850
	100	18×36	1035	900
500	150	22×40	1127	980
	10	13×20	288	250
	10	13×25	302	263
	15	13×25	396	344
	15	16×20	396	344
	22	16×25	504	438
	33	18×25	630	548
	47	18×30	792	689
	56	18×30	860	748
	68	18×35	1000	870

IT130 Series



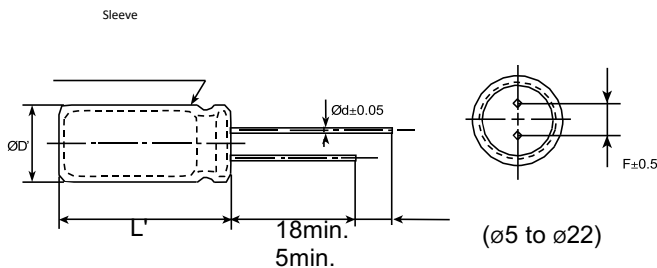
+105°C, Load life: 12000hours; +130°C, Load life: 2000-4000hours.

Used in LED Lighting, electronic ballast, electronic energy saving lamp, for power supply applications, etc.RoHS Compliant.

SPECIFICATIONS

Items	Characteristics																																			
Operating Temperature Range	-40~+130°C																																			
Rated Voltage Range	6.3V~120Vdc 160V~500Vdc																																			
Capacitance Tolerance	± 20% (120Hz, +25°C)																																			
Leakage Current	$I \leq 0.01CV$ or $3\mu A$, whichever is Lower. $I \leq 0.03CV + 10\mu A$																																			
Dissipation Factor (tanδ) (+25°C, 120Hz)	I: Max.leakage current (μA), Nominal capacitance (μF), V: Rated voltage (V) (at 25°C , after 3 minutes)																																			
	When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.																																			
Temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100~120</th> <th>160~500</th> </tr> </thead> <tbody> <tr> <td>Tanδ (max.)</td> <td>0.22</td> <td>0.20</td> <td>0.16</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.20</td> </tr> </tbody> </table>	Rated Voltage)	10	16	25	35	50	63	80	100~120	160~500	Tanδ (max.)	0.22	0.20	0.16	0.16	0.14	0.12	0.10	0.10	0.20															
	Rated Voltage)	10	16	25	35	50	63	80	100~120	160~500																										
Tanδ (max.)	0.22	0.20	0.16	0.16	0.14	0.12	0.10	0.10	0.20																											
<table border="1"> <thead> <tr> <th>Rated Voltage V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100~120</th> <th>160~250</th> <th>350~500</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+25°C)</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z(-40°C)/Z(+25°C)</td> <td>10</td> <td>8</td> <td>8</td> <td>6</td> <td>5</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>6</td> <td>10</td> </tr> </tbody> </table>	Rated Voltage V)	6.3	10	16	25	35	50	63	80	100~120	160~250	350~500	Z(-25°C)/Z(+25°C)	5	4	3	3	3	3	3	3	3	3	6	Z(-40°C)/Z(+25°C)	10	8	8	6	5	4	4	4	4	6	10
Rated Voltage V)	6.3	10	16	25	35	50	63	80	100~120	160~250	350~500																									
Z(-25°C)/Z(+25°C)	5	4	3	3	3	3	3	3	3	3	6																									
Z(-40°C)/Z(+25°C)	10	8	8	6	5	4	4	4	4	6	10																									
Load Life	<p>The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C or 130°C :</p> <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>±20% of the initial value</td> <td>ΦD</td> <td>Load life(130°C)</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>≤200% of the initial specified value</td> <td>≤6.3</td> <td>2000h</td> </tr> <tr> <td>Leakage Current</td> <td>≤The initial specified value</td> <td>8-10</td> <td>3000h</td> </tr> <tr> <td></td> <td></td> <td>> 10</td> <td>4000h</td> </tr> </tbody> </table>	Capacitance Change	±20% of the initial value	ΦD	Load life(130°C)	D.F. (tanδ)	≤200% of the initial specified value	≤6.3	2000h	Leakage Current	≤The initial specified value	8-10	3000h			> 10	4000h																			
Capacitance Change	±20% of the initial value	ΦD	Load life(130°C)																																	
D.F. (tanδ)	≤200% of the initial specified value	≤6.3	2000h																																	
Leakage Current	≤The initial specified value	8-10	3000h																																	
		> 10	4000h																																	
Shelf Life	<p>The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1,000 hours at 105°C without voltage applied :</p> <p>Capacitance change : ±20% of the initial measured value Dissipation factor : ≤200% of the initial specified value Leakage current : ≤200% of the initial specified value</p>																																			

Size(mm)



Frequency Coefficient

Rated Voltage(V)	Freq.(Hz)				
	CAP(μF)	120	1K	10K	100K
6.3~120	<180	0.40	0.75	0.90	1.00
	220~560	0.50	0.85	0.94	1.00
	680~1800	0.60	0.87	0.95	1.00
	2200~3900	0.75	0.90	0.95	1.00
	≥4700	0.85	0.95	0.98	1.00
160~500	-	0.50	0.70	0.80	1.00

ØD	5	6.3	8	10	12~13	16	18	22
Ød	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
ØD'	D<20 : ØD+0.5max. ; D≥20 : ØD+1.0max.							
L'	L+2max.							

IT130 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA,105°C)	Ripple (mA,130°C)
10	47	5×11	110	77
	100	5×11	220	155
	220	6.3×9	330	232
	220	6.3×12	352	248
	330	6.3×9	528	372
	330	8×12	561	395
	470	8×12	880	620
	680	8×12	1100	775
	680	8×16	1210	852
	1000	8×16	1430	1007
	1000	10×13	1485	1046
	1000	10×14	1540	1085
	1000	10×16	1606	1131
16	47	5×11	110	77
	100	5×11	198	139
	100	6.3×12	220	155
	220	6.3×12	330	232
	220	8×12	352	248
	330	8×12	550	387
	470	8×12	825	581
	470	10×13	946	666
	680	8×16	1100	775
	680	10×14	1199	844
	820	10×14	1320	930
	1000	10×17	1430	1007
	2200	13×21	2200	1549
25	10	5×11	72	50
	47	5×11	110	77
	68	5×11	132	93
	100	6.3×12	176	124
	100	8×12	198	139
	220	8×9	308	217
	220	8×12	330	232
	330	8×16	506	356
	390	8×16	605	426
	390	10×13	616	434
	390	10×14	660	465
	470	8×16	814	573
	470	8×20	858	604
	470	10×13	825	581
	470	10×17	880	620
	680	10×17	1155	813
	8×20	10×17	1276	899
1000	10×20	1375	968	
1500	13×25	1870	1317	
1800	13×21	2090	1472	
1800	13×25	2200	1549	
2200	16×26	2420	1704	
35	10	5×9	77	54
	10	5×11	90	64
	15	5×11	99	70
	22	5×11	110	77
	33	5×11	154	108
	47	5×11	220	155
	47	6.3×12	231	163
	68	6.3×12	275	194
	82	8×12	330	232
	100	6.3×12	385	271
	100	8×12	418	294
	180	8×12	605	426
	180	10×13	682	480
	220	8×12	660	465
	220	8×16	682	480
	220	10×13	682	480
	220	10×16	715	504

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA,105°C)	Ripple (mA,130°C)
35	330	8×20	880	620
	330	10×13	825	581
	330	10×17	935	658
	470	10×17	1100	775
	470	10×20	1210	852
	560	10×17	1320	930
	680	10×20	1474	1038
	680	13×21	1540	1085
	1000	10×25	1760	1239
	1000	13×21	1848	1301
	1500	13×21	1980	1394
	2200	22×27	2530	1782
	0.47	5×11	11	8
	1	5×11	22	15
2.2	5×11	33	23	
3.3	5×11	55	39	
4.7	5×11	61	43	
6.8	5×11	70	50	
10	5×9	83	58	
10	5×11	94	66	
22	5×11	121	85	
33	6.3×12	198	139	
47	6.3×12	231	163	
47	8×12	242	170	
56	6.3×12	308	217	
56	8×12	330	232	
68	8×12	352	248	
100	8×12	418	294	
100	10×13	440	310	
150	8×16	528	372	
150	10×13	550	387	
180	8×20	660	465	
180	10×17	682	480	
220	8×20	715	504	
220	10×13	693	488	
220	10×17	715	504	
220	10×20	748	527	
270	10×17	792	558	
270	10×20	814	573	
330	10×17	836	589	
330	10×20	864	608	
330	12×21	880	620	
330	13×21	935	658	
470	10×20	1155	813	
470	12×21	1210	852	
470	13×25	1320	930	
680	13×21	1540	1085	
680	13×25	1650	1162	
820	16×22	1980	1394	
1000	13×25	2090	1472	
1000	16×26	2200	1549	
2200	22×32	2750	1937	
63	2.2	5×11	35	25
	2.7	5×11	43	30
	4.7	5×11	66	46
	10	5×9	88	62
	10	5×11	88	62
	10	6.3×12	99	70
	22	6.3×12	138	97
	33	6.3×12	154	108
	33	8×12	165	116
	47	8×12	220	155
	68	8×12	242	170
	68	10×13	275	194
	82	8×12	330	232
	82	10×13	352	248
	100	8×12	396	279
	100	8×16	402	283
	100	10×13	407	287
100	10×17	418	294	

IT130 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(μ F)	Size \varnothing DXL(mm)	Ripple (mA,105°C)	Ripple (mA,130°C)
63	120	10×13	440	310
	120	10×17	462	325
	150	8×16	528	372
	150	10×13	528	372
	150	10×14	550	387
	150	10×17	561	395
	180	10×17	605	426
	220	10×17	660	465
	220	10×20	715	504
	270	10×20	770	542
	330	10×20	880	620
	330	13×21	913	643
	330	13×25	935	658
	470	13×21	1210	852
	470	13×25	1265	891
	680	13×25	1628	1146
	680	16×26	1760	1239
	1000	16×26	2090	1472
1000	18×27	2200	1549	
80	4.7	8×12	66	46
	6.8	5×11	83	58
	10	5×11	99	70
	22	6.3×12	138	97
	22	8×12	143	101
	33	6.3×12	198	139
	47	8×12	264	186
	47	8×14	286	201
	56	8×12	297	209
	56	10×13	314	221
	68	8×14	330	232
	68	8×16	336	236
	68	10×13	336	236
	68	10×16	341	240
	82	8×16	396	279
	82	10×17	418	294
	100	8×16	440	310
	100	10×13	440	310
	100	10×14	451	318
	100	10×16	462	325
	120	10×17	484	341
	120	10×20	495	349
	150	10×17	517	364
	150	10×20	534	376
	180	10×20	561	395
	220	10×20	715	504
	220	10×25	748	527
	220	13×21	770	542
	330	13×21	880	620
	330	13×25	935	658
	470	16×26	1100	775
	680	18×27	1408	992
	1800	13×21	2090	1472
1800	13×25	2200	1549	
2200	16×26	2420	1704	
100	1	5×11	22	15
	2.2	5×11	33	23
	2.2	6.3×12	39	27
	2.7	5×11	44	31
	3.3	5×11	53	37
	3.3	6.3×12	55	39
	3.9	5×11	66	46
	4.7	5×11	72	50
	4.7	8×12	75	53
	5.6	5×11	78	55
	6.8	5×11	84	59
	8.2	6.3×12	88	62
	10	5×11	94	66
	10	6.3×12	97	68
	10	8×12	105	74
15	6.3×12	110	77	

Rated Voltage(V)	CAP(μ F)	Size \varnothing DXL(mm)	Ripple (mA,105°C)	Ripple (mA,130°C)
100	15	8×12	121	85
	22	6.3×12	176	124
	22	8×12	182	128
	22	10×13	198	139
	27	8×12	220	155
	33	8×12	253	178
	33	8×14	259	182
	33	8×16	264	186
	33	10×13	264	186
	47	8×12	286	201
	47	8×14	292	205
	47	8×16	299	211
	47	10×13	308	217
	56	8×16	385	271
	56	10×14	403	284
	56	10×17	409	288
	68	8×16	440	310
	68	8×20	451	318
68	10×17	451	318	
82	8×20	491	345	
82	10×14	491	345	
82	10×20	495	349	
100	8×25	550	387	
100	10×17	530	373	
100	10×20	550	387	
120	10×20	572	403	
150	10×20	660	465	
150	12×21	682	480	
220	13×21	880	620	
220	13×25	902	635	
220	16×22	968	682	
270	13×25	1045	736	
330	13×25	1100	775	
330	18×22	1210	852	
470	16×32	1320	930	
560	18×32	1430	1007	
120	22	10×13	176	124
	33	10×13	271	191
	47	10×14	334	235
	47	10×17	341	240
	56	10×17	348	245
	68	10×20	361	254
	100	12×21	475	335
	120	13×21	642	452
	120	13×25	651	459
	150	13×25	691	486
	180	16×22	748	527
	220	16×26	864	608

IT130 Series

STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA,105°C)	Ripple (mA,130°C)	Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA,105°C)	Ripple (mA,130°C)
160	2.2	5×11	57	40	200	47	13×25	1056	744
	3.3	5×11	68	48		68	13×25	1408	992
	3.9	6.3×12	94	66		100	13×25	1518	1069
	4.7	6.3×12	99	70		100	13×25	1521	1071
	4.7	8×12	105	74	250	1	6.3×9	50	35
	5.6	8×12	110	77		2.2	6.3×9	77	54
	6.8	6.3×12	109	77		2.2	6.3×12	88	62
	6.8	8×12	113	80		3.3	6.3×9	110	77
	8.2	8×12	194	136		3.3	6.3×12	116	81
	10	8×12	264	186		3.3	8×12	121	85
	10	10×13	292	205		3.9	6.3×9	116	81
	15	8×16	308	217		4.7	6.3×12	121	85
	15	10×17	330	232		4.7	8×12	127	89
	22	8×12	418	294		5.6	6.3×12	127	89
	22	8×16	429	302		5.6	8×12	132	93
	22	10×17	484	341		6.8	8×12	165	116
	33	8×20	506	356		6.8	8×16	171	120
	33	10×17	553	390		8.2	8×12	220	155
	47	10×20	770	542		8.2	8×16	275	194
	47	12×18	781	550		10	8×9	154	108
	47	13×21	825	581		10	8×12	242	170
	56	10×25	1019	717		10	8×13	242	170
	56	12×18	1019	717		10	8×14	253	178
	68	12×21	1155	813		10	8×16	292	205
	68	13×25	1280	902		10	10×13	292	205
	82	10×25	1210	852		10	10×17	297	209
	82	13×21	1353	953		12	8×14	275	194
100	13×21	1453	1023	12		8×16	297	209	
100	13×25	1521	1071	15		8×16	363	256	
120	13×25	1697	1195	15		8×20	385	271	
150	16×25	1870	1317	22		10×17	512	360	
150	16×26	2024	1425	22	10×20	539	380		
200	1	5×11	50	35	22	12×21	550	387	
	2.2	5×11	74	52	27	10×20	594	418	
	2.2	6.3×12	84	59	33	10×20	649	457	
	3.3	6.3×12	116	81	33	12×21	693	488	
	3.3	8×12	121	85	33	13×21	715	504	
	4.7	6.3×12	121	85	33	13×25	737	519	
	4.7	8×12	127	89	47	13×21	1045	736	
	5.6	6.3×12	127	89	68	16×26	1419	999	
	5.6	8×9	130	91	400	1	6.3×9	66	46
	5.6	8×12	132	93		1	6.3×12	72	50
	6.8	8×12	138	97		1.2	6.3×12	75	53
	6.8	8×16	146	103		1.2	8×12	77	54
	6.8	10×13	146	103		1.5	6.3×12	77	54
	8.2	8×12	220	155		1.5	8×12	83	58
	8.2	8×16	242	170		1.8	6.3×12	88	62
	8.2	10×13	242	170		1.8	8×12	94	66
	10	8×12	253	178		2.2	6.3×9	77	54
	10	8×14	259	182		2.2	6.3×12	94	66
	10	8×16	275	194		2.2	8×9	94	66
	10	10×13	275	194		2.2	8×12	94	66
	10	10×17	286	201		3.3	6.3×12	105	74
	12	8×16	286	201		3.3	8×9	105	74
	12	10×13	286	201		3.3	8×12	110	77
	12	10×17	297	209		4.7	8×14	127	89
	15	8×20	352	248		4.7	8×16	132	93
	15	10×13	352	248		4.7	10×13	145	102
	15	10×16	374	263		5.6	8×16	160	112
	18	8×20	429	302		5.6	8×20	171	120
	18	10×17	440	310		5.6	10×17	176	124
	22	10×17	506	356		6.8	8×16	198	139
	22	10×20	528	372		6.8	8×16	198	139
	33	10×20	693	488		6.8	8×20	218	153
	33	13×17	693	488		6.8	10×17	218	153
	33	13×21	715	504		6.8	10×20	231	163
	47	13×21	1045	736		8.2	10×14	242	170
					8.2	10×17	253	178	

IT130 Series

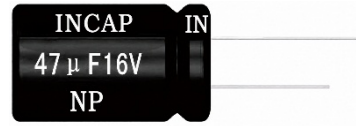
STANDARD RATINGS

Maximum ESR (Ω) at 20°C 100KHz Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA,105°C)	Ripple (mA,130°C)
400	10	10×14	253	178
	10	10×17	264	186
	10	10×20	275	194
	10	10×25	297	209
	12	10×17	297	209
	12	10×20	308	217
	15	10×20	308	217
	15	10×25	341	240
	15	13×18	347	244
	15	13×21	363	256
	18	13×21	369	260
	18	13×25	380	267
	22	10×25	402	283
	22	13×21	418	294
	22	13×25	534	376
	22	13×21	528	372
	33	13×21	539	380
	33	13×25	616	434
	33	16×26	660	465
	47	16×22	715	504
	47	16×26	781	550
	56	16×26	792	558
	68	18×27	880	620
	82	18×32	1056	744
100	18×36	1155	813	
450	1	6.3×12	83	58
	1	8×12	88	62
	2.2	8×12	99	70
	3.3	8×12	105	74
	4.7	8×14	127	89
	4.7	10×12	132	93
	4.7	10×17	143	101
	5.6	10×12	160	112
	6.8	10×12	187	132
	6.8	10×14	198	139
	6.8	10×17	215	151
	8.2	10×17	231	163
	8.2	10×20	253	178
	10	10×20	297	209
	15	10×20	385	271
	15	13×25	468	329
	22	13×25	550	387
	33	13×25	583	411
	33	16×26	660	465
	47	16×22	715	504
	47	16×26	781	550
	56	16×26	792	558
	68	18×27	880	620
	82	18×32	1056	744
100	18×36	1155	813	

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA,105°C)	Ripple (mA,130°C)
500	10	13×20	290	205
	10	13×25	305	216
	15	13×25	395	279
	15	16×20	390	275
	22	16×25	505	357
	33	18×25	630	446
	47	18×30	790	559
	56	18×30	860	608
	68	18×35	1000	707

NP Series



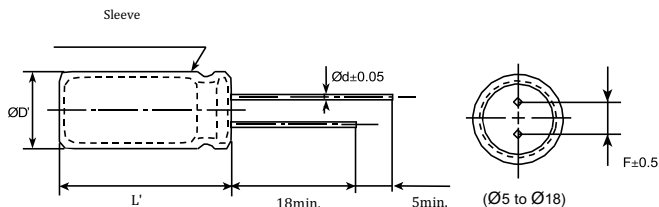
+105°C, Load life: 2000hours.

Non-polarized series, used in polarity reverse and change circuits. RoHS Compliant.

SPECIFICATIONS

Items	Characteristics																																	
Operating Temperature Range	-40~+105°C																																	
Rated Voltage Range	6.3V~100Vdc 160V~250Vdc																																	
Capacitance Tolerance	± 20% (120Hz, +20°C)																																	
Leakage Current	3μA, whichever is greater. I≤0.03CV+10μA I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 25°C, after 3 minutes)																																	
Dissipation Factor (tanδ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase. <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>160~200</th> <th>250</th> </tr> </thead> <tbody> <tr> <td>tanδ (max.)</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.09</td> <td>0.15</td> <td>0.20</td> </tr> </tbody> </table>	Rated Voltage (V)	10	16	25	35	50	63	80	100	160~200	250	tanδ (max.)	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.09	0.15	0.20											
Rated Voltage (V)	10	16	25	35	50	63	80	100	160~200	250																								
tanδ (max.)	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.09	0.15	0.20																								
Temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100~120</th> <th>160~250</th> <th>350~500</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+25°C)</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z(-40°C)/Z(+25°C)</td> <td>8</td> <td>8</td> <td>6</td> <td>5</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>6</td> <td>10</td> </tr> </tbody> </table>	Rated Voltage (V)	10	16	25	35	50	63	80	100~120	160~250	350~500	Z(-25°C)/Z(+25°C)	4	3	3	3	3	3	3	3	3	6	Z(-40°C)/Z(+25°C)	8	8	6	5	4	4	4	4	6	10
Rated Voltage (V)	10	16	25	35	50	63	80	100~120	160~250	350~500																								
Z(-25°C)/Z(+25°C)	4	3	3	3	3	3	3	3	3	6																								
Z(-40°C)/Z(+25°C)	8	8	6	5	4	4	4	4	6	10																								
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C : <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>≤200% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>≤The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	±20% of the initial value	D.F. (tanδ)	≤200% of the initial specified value	Leakage Current	≤The initial specified value																											
Capacitance Change	±20% of the initial value																																	
D.F. (tanδ)	≤200% of the initial specified value																																	
Leakage Current	≤The initial specified value																																	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied : Capacitance change : ±20% of the initial measured value Dissipation factor : ≤200% of the initial specified value Leakage current : ≤200% of the initial specified value																																	

Size (mm)



ØD	5	6.3	8	10	12~13	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.						

Frequency Coefficient

Rated Voltage(V)	Freq.(Hz)				
	CAP(μF)	60	120	1K	≥10K
6.3~100	< 68	0.80	1.00	1.45	1.70
	100~470	0.80	1.00	1.35	1.50
	680~4700	0.80	1.00	1.20	1.30

NP Series:

STANDARD RATINGS

Maximum Allowable Ripple Current (mA rms) at 105°C 120Hz

Rated Voltage(V)	10V		16V		25V		35V		50V		63V	
Items CAP(uF)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)
1									5×11	10	5×11	11
2.2									5×11	15	5×11	16
3.3									5×11	18	5×11	20
4.7							5×11	21	5×11	22	6.3×12	24
10			5×11	27	5×11	27	5×11	30	6.3×12	37	6.3×12	40
22	5×11	34	5×11	40	6.3×12	46	6.3×12	51	8×12	63	8×12	68
33	5×11	45	5×11	49	6.3×12	56	8×12	72	8×12	77	10×13	98
47	5×11	54	6.3×12	67	6.3×12	67	8×12	86	10×13	105	10×16	130
100	6.3×12	90	8×12	110	8×12	110	10×16	160	10×20	190	13×21	225
220	8×12	150	10×13	195	10×16	215	13×21	290	12.5×25	340	16×25	405
330	10×16	240	10×16	265	13×21	320	13×21	350	16×25	460	16×32	535
470	10×20	290	10×20	345	12.5×25	380	12.5×25	465	16×32	590	18×36	680
1000	13×21	510	12.5×25	305	16×25	670	16×32	805				
2200	16×25	940	16×32	1070	18×35	1140						

Rated Voltage(V)	100V		160V		200V		250V	
Items CAP(uF)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)
1	5×11	12	5×11	8	5×11	9	6.3×12	10
2.2	6.3×12	20	6.3×12	11	8×12	12	8×12	13
3.3	6.3×12	25	8×12	18	8×12	22	10×13	26
4.7	6.3×12	30	8×12	26	10×13	30	10×16	37
10	8×12	50	10×13	31	10×16	37	10×20	50
22	10×16	97	10×16	60	10×20	66	10×20	79
33	10×20	140	13×21	117	13×21	117	13×25	138
47	13×21	170	13×21	143	13×25	158	16×25	169
100	16×25	300	16×25	188				
220	18×35	510						

ISMD10 Series:

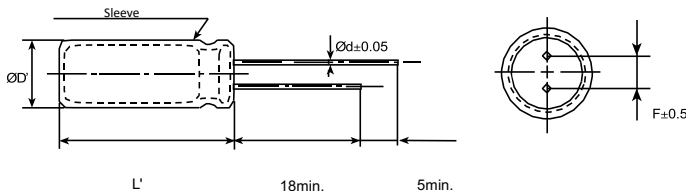
+105°C, Load life: 8000~10000hours.
Available for high density surface mounting.RoHS
Compliant.



SPECIFICATIONS

Items	Characteristics																																	
Operating Temperature Range	-40~+105°C																																	
Rated Voltage Range	6.3V~100Vdc 160V~450Vdc																																	
Capacitance Tolerance	± 20% (120Hz, +25°C)																																	
Leakage Current	$I \leq 0.03CV$ or $4\mu A$, whichever is Lower. $I \leq 0.04CV + 100\mu A$ I: Max. leakage current (μA), C: Nominal capacitance (μF), V: Rated voltage (V) (at 25°C, after 3 minutes)																																	
Dissipation Factor (tan δ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000 μF , add 0.02 to the value above for each 1000 μF increase. <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>160~450</th> </tr> </thead> <tbody> <tr> <td>tanδ (max.)</td> <td>0.28</td> <td>0.26</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> <td>0.10</td> <td>0.20</td> </tr> </tbody> </table>	Rated Voltage (V)	10	16	25	35	50	63	80	100	160~450	tan δ (max.)	0.28	0.26	0.18	0.16	0.14	0.12	0.12	0.10	0.20													
Rated Voltage (V)	10	16	25	35	50	63	80	100	160~450																									
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Z(-40°C)/Z(+25°C)	8	6	4	3	3	3	3	3	10	18																								
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C : <table border="1"> <thead> <tr> <th>Rated Voltage(Vdc)</th> <th>6.3~100</th> <th>160~400</th> </tr> </thead> <tbody> <tr> <td>Capacitance Change</td> <td>±20% of the initial value</td> <td>±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>≤300% of the initial specified value</td> <td>≤200% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>≤The initial specified value</td> <td>≤The initial specified value</td> </tr> </tbody> </table>	Rated Voltage(Vdc)	6.3~100	160~400	Capacitance Change	±20% of the initial value	±20% of the initial value	D.F. (tan δ)	≤300% of the initial specified value	≤200% of the initial specified value	Leakage Current	≤The initial specified value	≤The initial specified value																					
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Leakage Current	≤300% of the initial specified value	≤200% of the initial specified value																																

Size(mm)



(Ø5 to Ø13)

Frequency Coefficient

Rated Voltage(V)	Freq.(Hz)	CAP(μF)			
		120	1K	10K	100K
6.3~450	-	0.50	0.70	0.80	1.00

ØD	5	6.3	8	10	13
Ød	0.5	0.5	0.6	0.6	0.6
F	2.0	2.5	3.5	5.0	5.0
ØD'	ØD+0.5max				
L'	L+2max.				

ISMD10 Series:

STANDARD RATINGS

Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
10	22	5×7.7	41
	33	5×7.7	53
	47	6.3×7.7	69
	68	6.3×7.7	90
	150	6.3×7.7	113
	220	6.3×7.7	180
	330	8×10.5	300
	470	8×10.5	420
	680	10×10.5	588
1000	10×10.5	750	
16	22	5×7.7	45
	33	6.3×7.7	60
	47	6.3×7.7	75
	68	6.3×7.7	90
	100	6.3×7.7	105
	150	6.3×7.7	143
	220	8×10.5	345
	330	8×10.5	435
	470	8×10.5	480
680	10×10.5	705	
25	22	5×7.7	35
	33	6.3×7.7	57
	47	6.3×7.7	72
	68	6.3×7.7	99
	82	6.3×7.7	117
	100	6.3×7.7	120
	150	8×10.5	153
	220	8×10.5	360
	330	8×10.5	450
330	10×10.5	480	
470	10×13.5	675	
35	10	5×7.7	45
	22	6.3×7.7	66
	33	6.3×7.7	105
	47	6.3×7.7	120
	68	8×10.5	150
	150	8×10.5	390
	220	10×10.5	600
50	4.7	5×7.7	30
	10	6.3×7.7	60
	22	6.3×7.7	90
	33	8×10.5	108
	47	8×10.5	135
	68	8×10.5	345
	100	8×10.5	450
63	150	10×10.5	525
	2.2	6.3×7.7	51
	3.3	6.3×10.5	105
	4.7	8×10.5	240
	10	8×10.5	285
	33	10×10.5	345
	47	10×10.5	390
100	68	10×13.5	450
	82	10×14.5	570
	4.7	6.3×7.7	65
	22	8×10.5	175
82	10×14.5	360	
100	10×14.5	405	

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
160	3.3	6.3×7.7	43
	4.7	6.3×7.7	55
	10	8×10.5	112
	15	8×12.5	180
	2.2	6.3×12.5	50
200	3.3	6.3×12.5	56
	3.3	8×12.5	62
	4.7	6.3×12.5	74
	4.7	8×12.5	78
	5.6	6.3×12.5	82
	5.6	8×10.5	84
	5.6	8×12.5	88
	6.8	8×12.5	90
	6.8	10×13.5	94
	8.2	8×12.5	110
	8.2	10×13.5	120
	10	8×12.5	166
	10	10×13.5	180
	12	10×13.5	186
	15	10×13.5	220
22	10×14.5	280	
250	1	6.3×10.5	40
	2.2	6.3×10.5	44
	2.2	6.3×12.5	58
	3.3	6.3×10.5	66
	3.3	6.3×12.5	70
	3.3	8×12.5	76
	3.9	6.3×10.5	80
	4.7	6.3×12.5	90
	4.7	8×12.5	96
	5.6	8×12.5	100
	6.8	8×12.5	110
	8.2	8×12.5	148
	10	8×12.5	160
	10	10×13.5	172
	400	1	6.3×10.5
1		6.3×12.5	34
1.2		6.3×12.5	48
1.5		6.3×12.5	48
1.8		6.3×12.5	60
1.8		8×12.5	60
2.2		6.3×10.5	62
2.2		8×10.5	66
2.7		8×12.5	80
3.3		6.3×12.5	90
3.3		8×10.5	94
3.3		8×12.5	98
4.7		8×12.5	110
5.6		8×12.5	132
5.6		10×13.5	144
6.8	10×13.5	160	
8.2	10×14.5	200	
10	10×14.5	234	
450	1	6.3×10.5	28
	2.2	6.3×12.5	58
	2.2	8×10.5	64
	3.3	8×13.5	94
	4.7	8×13.5	105
	5.6	8×13.5	127
	5.6	8×16.5	137
	3.9	10×10.5	105
	4.7	10×10.5	110
	5.6	10×10.5	121
	5.6	10×13.5	127
	6.8	10×13.5	142
	6.8	10×14.5	147
	8.2	10×14.5	158
	10	10×14.5	165
8.2	10×16.5	180	

ISMD130 Series:

+105°C, Load life: 12000;

+130°C Load life: 2000 ~ 4000

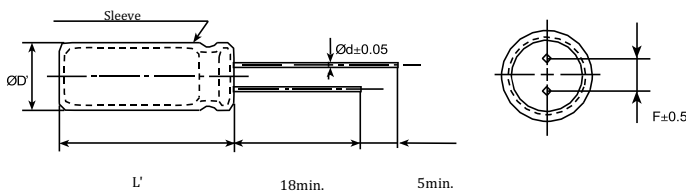
Available for high density surface mounting. RoHS Compliant.



SPECIFICATIONS

Items	Characteristics																																		
Operating Temperature Range	-40 ~ +130°C																																		
Rated Voltage Range	6.3V ~ 100Vdc	160V ~ 450Vdc																																	
Capacitance Tolerance	± 20% (120Hz, +25°C)																																		
Leakage Current	$I \leq 0.03CV$ or $4\mu A$, whichever is Lower. I: Max. leakage current (μA), C: Nominal capacitance (μF), V: Rated voltage (V)	$I \leq 0.04CV + 100\mu A$ (at 25°C, after 3 minutes)																																	
Dissipation Factor (tan δ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000 μF , add 0.02 to the value above for each 1000 μF increase.																																		
	<table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>160 ~ 450</th> </tr> </thead> <tbody> <tr> <td>tanδ (max.)</td> <td>0.28</td> <td>0.26</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> <td>0.10</td> <td>0.20</td> </tr> </tbody> </table>	Rated Voltage (V)	10	16	25	35	50	63	80	100	160 ~ 450	tan δ (max.)	0.28	0.26	0.18	0.16	0.14	0.12	0.12	0.10	0.20														
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Temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>160 ~ 250</th> <th>350 ~ 450</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+25°C)</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>6</td> <td>6</td> </tr> <tr> <td>Z(-40°C)/Z(+25°C)</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>10</td> <td>18</td> </tr> </tbody> </table>	Rated Voltage (V)	10	16	25	35	50	63	80	100	160 ~ 250	350 ~ 450	Z(-25°C)/Z(+25°C)	3	2	2	2	2	2	2	2	6	6	Z(-40°C)/Z(+25°C)	8	6	4	3	3	3	3	3	10	18	
Rated Voltage (V)	10	16	25	35	50	63	80	100	160 ~ 250	350 ~ 450																									
Z(-25°C)/Z(+25°C)	3	2	2	2	2	2	2	2	6	6																									
Z(-40°C)/Z(+25°C)	8	6	4	3	3	3	3	3	10	18																									
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C or 130°C :																																		
	<table border="1"> <thead> <tr> <th>Rated Voltage(Vdc)</th> <th>6.3 ~ 100</th> <th>160 ~ 400</th> </tr> </thead> <tbody> <tr> <td>Capacitance Change</td> <td>±20% of the initial value</td> <td>±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>≤300% of the initial specified value</td> <td>≤200% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>≤The initial specified value</td> <td>≤The initial specified value</td> </tr> </tbody> </table>	Rated Voltage(Vdc)	6.3 ~ 100	160 ~ 400	Capacitance Change	±20% of the initial value	±20% of the initial value	D.F. (tan δ)	≤300% of the initial specified value	≤200% of the initial specified value	Leakage Current	≤The initial specified value	≤The initial specified value																						
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Leakage Current	≤The initial specified value	≤The initial specified value																																	
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Size(mm)



(Ø5 to Ø13)

Frequency Coefficient

Rated Voltage(V)	Freq.(Hz) CAP(μF)	120	1K	10K	100K
		6.3 ~ 450	-	0.50	0.70

ØD	5	6.3	8	10	13
Ød	0.5	0.5	0.6	0.6	0.6
F	2.0	2.5	3.5	5.0	5.0
ØD'	ØD+0.5max				
L'	L+2max.				

ISMD130 Series:

STANDARD RATINGS

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
10	22	5×7.7	44
	33	5×7.7	57
	47	6.3×7.7	75
	68	6.3×7.7	97
	150	6.3×7.7	122
	220	6.3×7.7	194
	330	8×10.5	324
	470	8×10.5	454
	680	10×10.5	635
1000	10×10.5	810	
16	22	5×7.7	49
	33	6.3×7.7	65
	47	6.3×7.7	81
	68	6.3×7.7	97
	100	6.3×7.7	113
	150	6.3×7.7	154
	220	8×10.5	373
	330	8×10.5	470
	470	8×10.5	518
680	10×10.5	761	
25	22	5×7.7	38
	33	6.3×7.7	62
	47	6.3×7.7	78
	68	6.3×7.7	107
	82	6.3×7.7	126
	100	6.3×7.7	130
	150	8×10.5	165
	220	8×10.5	389
	330	8×10.5	486
330	10×10.5	518	
470	10×10.5	729	
35	10	5×7.7	49
	22	6.3×7.7	71
	33	6.3×7.7	113
	47	6.3×7.7	130
	68	8×10.5	162
	150	8×10.5	421
	220	10×10.5	648
330	10×10.5	729	
50	4.7	5×7.7	32
	10	6.3×7.7	65
	22	6.3×7.7	97
	33	8×10.5	117
	47	8×10.5	146
	68	8×10.5	373
	100	8×10.5	486
150	10×10.5	567	
63	2.2	6.3×7.7	55
	3.3	6.3×7.7	113
	4.7	6.3×7.7	259
	10	6.3×10.5	308
	33	10×10.5	373
	47	10×10.5	421
	68	10×13.5	486
82	10×14.5	616	
100	4.7	6.3×7.7	70
	22	8×10.5	189
	82	10×14.5	389
	100	10×14.5	437

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (mA)
160	3.3	6.3×7.7	46
	4.7	6.3×7.7	59
	10	8×10.5	121
	15	8×12.5	194
200	2.2	6.3×12.5	54
	3.3	6.3×12.5	60
	3.3	8×12.5	67
	4.7	6.3×12.5	80
	4.7	8×12.5	84
	5.6	6.3×12.5	89
	5.6	8×10.5	91
	5.6	8×12.5	95
	6.8	8×12.5	97
	6.8	10×13.5	102
	8.2	8×12.5	119
	8.2	10×13.5	130
	10	8×12.5	179
	10	10×13.5	194
12	10×13.5	201	
15	10×13.5	238	
22	10×14.5	302	
250	1	6.3×10.5	43
	2.2	6.3×10.5	48
	2.2	6.3×12.5	63
	3.3	6.3×10.5	71
	3.3	6.3×12.5	76
	3.3	8×12.5	82
	3.9	6.3×10.5	86
	4.7	6.3×12.5	97
	4.7	8×12.5	104
	5.6	8×12.5	108
	6.8	8×12.5	119
	8.2	8×12.5	160
	10	8×12.5	173
	10	10×13.5	186
400	1	6.3×10.5	32
	1	6.3×12.5	37
	1.2	6.3×12.5	52
	1.5	6.3×12.5	52
	1.8	6.3×12.5	65
	1.8	8×12.5	65
	2.2	6.3×10.5	67
	2.2	8×10.5	71
	2.7	8×12.5	86
	3.3	6.3×12.5	97
	3.3	8×10.5	102
	3.3	8×12.5	106
	4.7	8×12.5	119
	5.6	8×12.5	143
5.6	10×13.5	156	
6.8	10×13.5	173	
8.2	10×14.5	216	
10	10×14.5	253	

Maximum Allowable Ripple Current (mA rms) at 105°C 100 KHz

ISMD Series:

+105°C, Load life: 2000 hours.

Available for high density surface mounting.

RoHS Compliant.

SPECIFICATIONS

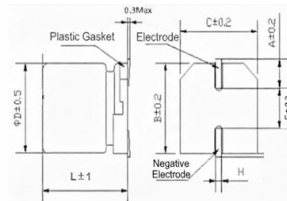
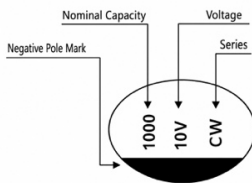


Items	Characteristics																													
Operating Temperature Range	-40~+105°C																													
Rated Voltage Range	6.3V~100Vdc																													
Capacitance Tolerance	±20% (120Hz, +20°C)																													
Leakage Current	I≤0.03CV or 4μA, whichever is greater.																													
	I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 25°C, after 3 minutes)																													
Dissipation Factor (tanδ) (+25°C, 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>tanδ (max.)</td> <td>0.32</td> <td>0.28</td> <td>0.26</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.12</td> <td>0.10</td> </tr> </tbody> </table>										Rated Voltage)	6.3	10	16	25	35	50	63	80	100	tanδ (max.)	0.32	0.28	0.26	0.18	0.16	0.14	0.12	0.12	0.10
	Rated Voltage)	6.3	10	16	25	35	50	63	80	100																				
tanδ (max.)	0.32	0.28	0.26	0.18	0.16	0.14	0.12	0.12	0.10																					
When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.																														
Temperature characteristics (Impedance ratio at 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100																				
	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	2	2	2																				
	Z(-40°C)/Z(+20°C)	10	8	6	4	3	3	3	3	3																				
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C :																													
	Rated Voltage(Vdc)		6.3~100																											
Capacitance Change		±20% of the initial value																												
D.F. (tanδ)		≤300% of the initial specified value																												
Leakage Current		≤The initial specified value																												
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1,000 hours at 105°C without voltage applied :																													
	Rated Voltage(Vdc)		6.3~100																											
Capacitance Change		±20% of the initial value																												
D.F. (tanδ)		≤300% of the initial specified value																												
Leakage Current		≤300% of the initial specified value																												

Size(mm)

Frequency Coefficient

Rated Voltage(V)	Freq.(Hz)				
	CAP(μF)	120	1K	10K	100K
6.3~100	-	1.00	1.35	1.40	1.50



ΦD	6.3	8	10
A	2.4	2.9	3.2
B	6.6	8.3	10.3
C	6.6	8.3	10.3
E	2.2	3.1	4.5
H	0.5~0.8	0.7~1.1	0.7~1.1
L	±1		

ISMD Series:

STANDARD RATINGS

Maximum Allowable Ripple Current (mA rms) at 105°C 120Hz

Rated Voltage(V)		6.3		10		16		25		35		50	
CAP(uF)	Items	Size DXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)
		1											
2.2												4×5.4	12
3.3												4×5.4	14
4.7								4×5.4	17	4×5.4	17	5×5.4	20
10						4×5.4	20	4×5.4	20	5×5.4	27	6.3×5.4	32
22		4×5.4	22	4×5.4	22	5×5.4	30	5×5.4	30	6.3×5.4	44	6.3×5.4 8×6.5	38 67
33		5×5.4	34	5×5.4	34	5×5.4	34	6.3×5.4	46	6.3×5.4 8×6.5	46 76	6.3×7.7	65
47		5×5.4	38	5×5.4	38	6.3×5.4	48	6.3×7.7 8×6.5	48 79	6.3×7.7	80	6.3×7.7	70
100		6.3×5.4	69	6.3×5.4 8×6.5	69 90	6.3×5.4	69	6.3×7.7	100	8×10.5	240	8×10.5	210
220		6.3×5.4 8×6.5	120 120	6.3×7.7	120	6.3×7.7	120	8×10.5 10×7.7	270 270	8×10.5	270	10×10.5	330
330		8×10.5	290	8×10.5	290	8×10.5 10×7.7	290 290	8×10.5	290	10×10.5	370		
470		8×10.5	320	8×10.5 10×7.7	320 320	10×7.7	380	10×10.5	380				

Rated Voltage(V)		63		100	
CAP(uF)	Items	Size ØDXL(mm)	Ripple (mA)	Size ØDXL(mm)	Ripple (mA)
		1		4×5.4	8
2.2		4×5.4	12		
3.3		5×5.4	17		
4.7		6.3×5.7	22		
10		6.3×5.7 8×6.5	32 51		
22		6.3×7.7	58	8×10.5	100
33		8×10.5	140	10×10.5	150
47		8×10.5	170		
100		10×10.5	310		

ISMD5 Series:

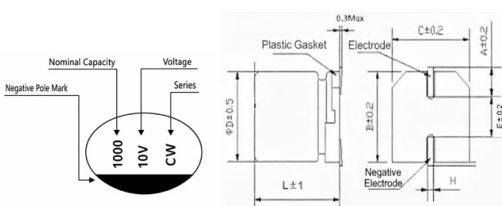


+105°C, Load life: 5000hours.
Available for high density surface mounting.RoHS Compliant.

SPECIFICATIONS

Items	Characteristics											
Operating Temperature Range	-40~+105°C											
Rated Voltage Range	6.3V~100Vdc	160V~450Vdc										
Capacitance Tolerance	± 20% (120Hz, +25°C)											
Leakage Current	I≤0.03CV or 4μA, whichever is Lower.											
	I≤0.04CV+100μA											
Dissipation Factor (tanδ) (+25°C, 120Hz)	I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 25°C, after 3 minutes)											
	When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.											
Temperature characteristics (Impedance ratio at 120Hz)	Rated Voltage (V)											
	6.3	10	16	25	35	50	63	80	100	160~250	350~450	
	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	2	2	2	6	6
Z(-40°C)/Z(+20°C)	10	8	6	4	3	3	3	3	3	10	18	
Load Life	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 a specified period of time at 105°C :											
	Rated Voltage(Vdc)	6.3~100					160~450					
	Capacitance Change	±20% of the initial value					±20% of the initial value					
	D.F. (tanδ)	≤300% of the initial specified value					≤200% of the initial specified value					
	Leakage Current	≤The initial specified value					≤The initial specified value					
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied :											
	Rated Voltage(Vdc)	6.3~100					160~450					
	Capacitance Change	±20% of the initial value					±20% of the initial value					
	D.F. (tanδ)	≤300% of the initial specified value					≤200% of the initial specified value					
	Leakage Current	≤300% of the initial specified value					≤200% of the initial specified value					

Size (mm)



ΦD	6.3	8	10
A	2.4	2.9	3.2
B	6.6	8.3	10.3
C	6.6	8.3	10.3
E	2.2	3.1	4.5
H	0.5~0.8	0.7~1.1	0.7~1.1
L	±1		

Frequency Coefficient

Rated Voltage(V)	Freq.(Hz) CAP(μF)	120	1K	10K	100K
6.3~450	-	1.00	1.35	1.40	1.50

ISMD10 Series:

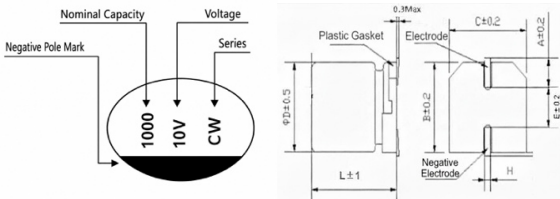
+105°C, Load life: 8000-10000 hours.
Available for high density surface mounting, RoHS
Compliant.



SPECIFICATIONS

Items	Characteristics	
Operating Temperature Range	-40~+105°C	
Rated Voltage Range	6.3V~100Vdc	160V~450Vdc
Capacitance Tolerance	±20% (120Hz, +25°C)	
Leakage Current	I≤0.03CV or 4μA, whichever is Lower.	
	I≤0.04CV+100μA	
Dissipation Factor (tanδ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.	
	Rated Voltage)	6.3 10 16 25 35 50 63 80 100 160~450
Temperature characteristics (Impedance ratio at 120Hz)	Rated Voltage (V)	6.3 10 16 25 35 50 63 80 100 160~250 350~450
	Z(-25°C)/Z(+25°C)	4 3 2 2 2 2 2 2 2 6 6
	Z(-40°C)/Z(+20°C)	10 8 6 4 3 3 3 3 3 10 18
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C :	
	Rated Voltage(Vdc)	6.3~100 160~450
	Capacitance Change	±20% of the initial value ±20% of the initial value
	D.F. (tanδ)	≤300% of the initial specified value ≤200% of the initial specified value
	Leakage Current	≤The initial specified value ≤The initial specified value
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1,000 hours at 105°C without voltage applied :	
	Rated Voltage(Vdc)	6.3~100 160~450
	Capacitance Change	±20% of the initial value ±20% of the initial value
	D.F. (tanδ)	≤300% of the initial specified value ≤200% of the initial specified value
	Leakage Current	≤300% of the initial specified value ≤200% of the initial specified value

Size (mm)



ΦD	6.3	8	10
A	2.4	2.9	3.2
B	6.6	8.3	10.3
C	6.6	8.3	10.3
E	2.2	3.1	4.5
H	0.5~0.8	0.7~1.1	0.7~1.1
L	±1		

Frequency Coefficient

Rated Voltage(V)	Freq.(Hz)			
	120	1K	10K	100K
6.3~450	-	1.00	1.35	1.40

IS2 Series:

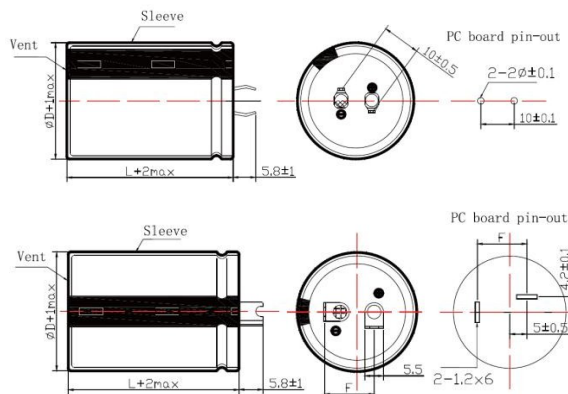


+105°C, Load life: 2000hours.
Available for switching power supplies, inverter, etc.RoHS
Compliant.

SPECIFICATIONS

Items	Characteristics	
Operating Temperature Range	-40~+105°C	-25~+105°C
Rated Voltage Range	16V~100Vdc	160V~500Vdc
Capacitance Tolerance	± 20% (120Hz, +25°C)	
Leakage Current	$I < \sqrt{3} CV$ or 1.5mA, whichever is smaller	
	I:Max.leakage current (µA),C:Nominal capacitance (µF),V: Rated voltage (V) (at 25°C, after 5 minutes)	
Dissipation Factor (tanδ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000µF, add 0.02 to the value above for each 1000µF increase.	
	Rated Voltage)	16 25 35 50 63 80 100 160~450
Temperature characteristics (Impedance ratio at 120Hz)	tanδ (max.)	0.50 0.45 0.40 0.35 0.30 0.25 0.20 0.15
	Rated Voltage (V)	16 25 35 50 63 80 100 160~250 315~400 420~500
	Z(-25°C)/Z(+20°C)	4 3 3 2 2 2 2 4 8 8
Load Life	Z(-40°C)/Z(+20°C)	15 10 8 6 6 5 5 - - -
	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C :	
ShelfLife	Capacitance Change	±20% of the initial value
	D.F. (tanδ)	≤200% of the initial specified value
	Leakage Current	≤The initial specified value
The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1,000 hours at 105°C without voltage applied :		
Capacitance change : ±20% of the initial measured value		
Dissipation factor : ≤150% of the initial specified value		
Leakage current : ≤200% of the initial specified value		

Size (mm)



Frequency Coefficient

Freq.(Hz)	120	1K	10K	100K
16~50	1.00	1.03	1.05	1.08
63~100	1.00	1.07	1.13	1.19
160~250	1.00	1.32	1.45	1.50
315~500	1.00	1.30	1.41	1.43

IS2 Series:

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
16	12000	25×30	2.30
	15000	25×35	2.58
	18000	25×40	3.16
	22000	25×45	3.36
	22000	30×35	3.30
	27000	25×50	3.85
	27000	30×40	3.80
	33000	30×45	4.30
	39000	30×50	4.81
	39000	35×40	4.80
	47000	35×45	5.53
25	8200	25×30	2.34
	10000	25×35	2.61
	12000	25×40	2.81
	15000	25×45	3.27
	15000	30×35	3.13
	18000	30×40	3.56
	22000	30×45	4.04
	27000	35×45	4.74
	33000	35×50	5.50
	35	5600	25×30
6800		25×35	2.31
8200		25×40	2.73
10000		25×45	3.05
10000		30×35	3.05
12000		25×50	3.37
12000		30×40	3.23
15000		30×45	3.72
18000		35×40	4.37
22000		35×45	4.92
50	4700	25×40	2.43
	5600	25×45	2.72
	10000	30×50	4.05
	15000	30×60	4.76
	15000	35×50	4.77
63	3300	22×45	2.33
	3300	22×55	2.36
	4700	25×50	2.97
	6800	30×40	3.62
	6800	30×50	3.65
	10000	30×60	4.50
	10000	35×50	4.48
	10000	35×60	4.54
	15000	35×60	4.83
	18000	35×70	5.12
80	6800	30×50	3.91
	6800	35×45	3.90
	8200	35×50	4.20
	8200	35×60	4.23
	10000	35×60	4.56
100	2200	25×45	2.53
	4700	30×60	3.82
	4700	35×45	3.80
	6800	35×60	3.90
	8200	35×70	4.12
200	10000	35×70	4.25
	270	22×25	0.98
	330	22×30	1.18
	330	25×25	1.18
	390	22×35	1.28
	390	25×30	1.32
	470	22×40	1.43
	470	25×30	1.43
	470	30×25	1.46
	560	22×45	1.58
	560	25×35	1.58
	560	30×30	1.60
	680	22×50	1.73
	680	25×40	1.76
	680	30×30	1.73
820	25×45	2.10	

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)	
200	820	30×35	2.11	
	820	35×30	2.09	
	1000	25×50	2.35	
	1000	30×40	2.38	
	1000	35×35	2.28	
	1200	30×45	2.68	
	1200	35×35	2.51	
	1500	35×40	2.96	
	1800	35×50	3.43	
	220	22×25	0.93	
	270	22×30	1.08	
	330	22×35	1.22	
	330	25×25	1.13	
	390	22×35	1.28	
220	390	25×25	1.25	
	470	22×40	1.40	
	470	25×30	1.38	
	470	30×25	1.36	
	560	22×45	1.59	
	560	25×35	1.55	
	560	30×30	1.59	
	560	35×25	1.50	
	680	25×40	1.74	
	680	30×35	1.75	
	680	35×30	1.71	
	820	25×45	1.96	
	820	30×40	2.05	
	820	35×30	1.93	
	1000	30×45	2.43	
	1000	35×35	2.18	
	1200	35×40	2.35	
	1500	35×45	2.61	
	250	180	22×25	0.82
		220	22×30	0.95
220		25×25	0.97	
270		22×35	1.09	
270		25×30	1.13	
330		22×40	1.24	
330		25×30	1.24	
330		30×25	1.29	
390		22×45	1.39	
390		25×35	1.40	
390		30×30	1.48	
470		22×50	1.55	
470		25×40	1.59	
470		30×30	1.59	
560		25×45	1.78	
315	560	30×35	1.82	
	680	25×50	2.01	
	680	30×40	2.07	
	680	35×30	1.94	
	820	30×45	2.32	
	820	35×35	2.24	
	1000	30×50	2.62	
	1000	35×40	2.55	
	1200	35×45	2.85	
	120	22×25	0.54	
	150	22×30	0.65	
	150	25×25	0.64	
	180	22×35	0.77	
	180	25×30	0.70	
	220	22×40	0.88	
220	25×30	0.84		
220	30×25	0.82		
270	22×45	1.00		
270	25×35	0.97		
270	30×30	1.00		
330	22×50	1.12		
330	25×40	1.10		
330	30×35	1.20		
390	25×45	1.29		

IS2 Series:

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
315	390	30×35	1.29
	390	35×30	1.22
	470	30×40	1.52
	470	35×35	1.45
	560	30×45	1.64
	560	35×40	1.64
	680	35×45	1.94
	820	35×50	2.17
350	100	22×25	0.52
	120	22×30	0.60
	120	25×25	0.61
	150	22×35	0.71
	150	25×30	0.71
	180	22×40	0.82
	180	25×30	0.78
	180	30×25	0.80
	220	22×45	0.92
	220	25×35	0.90
	220	30×30	0.97
	270	22×50	1.05
	270	25×40	1.03
	270	30×30	1.01
	330	25×45	1.22
	330	30×35	1.21
	330	35×30	1.18
	390	25×50	1.35
	390	30×40	1.38
	390	35×35	1.35
	470	30×45	1.55
	470	35×35	1.51
	560	30×50	1.74
	560	35×40	1.68
680	35×45	1.94	
400	68	22×25	0.47
	82	22×30	0.54
	100	22×30	0.62
	100	25×25	0.59
	120	22×35	0.71
	120	25×30	0.71
	150	22×40	0.84
	150	25×35	0.84
	150	30×25	0.78
	180	22×45	0.95
	180	25×35	0.92
	180	30×30	0.94
	220	22×50	1.08
	220	25×40	1.04
	220	30×35	1.22
	270	25×50	1.27
	270	30×40	1.29
	270	35×30	1.16
	330	30×45	1.46
	330	35×35	1.12
	390	30×50	1.62
	390	35×40	1.58
	470	35×45	1.86
	560	35×50	2.07
420	68	22×25	0.48
	82	22×30	0.56
	82	25×25	0.55
	100	22×30	0.62
	100	25×25	0.62
	120	22×25	0.72
	120	25×30	0.70
	120	30×25	0.73
	150	22×45	0.85
	150	25×35	0.82
	150	30×25	0.82
	180	22×50	1.01
	180	25×40	0.93
	180	30×30	0.94
180	35×25	0.87	

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)	
420	220	25×45	1.12	
	220	30×35	1.08	
	220	35×30	1.04	
	270	25×50	1.35	
	270	30×40	1.24	
	270	35×35	1.25	
	330	30×45	1.48	
	330	35×35	1.41	
	390	30×50	1.66	
	390	35×40	1.60	
	470	35×45	1.85	
	450	56	22×25	0.41
		68	22×30	0.49
		68	25×25	0.49
82		22×35	0.54	
82		25×30	0.55	
100		22×40	0.63	
100		25×30	0.63	
100		30×25	0.65	
120		22×45	0.71	
120		25×35	0.70	
120		30×30	0.76	
150		22×50	0.79	
150		25×40	0.81	
150		30×30	0.84	
180		25×45	0.92	
180		30×35	0.96	
220		25×50	1.04	
220		30×40	1.09	
220		35×30	1.00	
270		30×45	1.24	
270		35×35	1.24	
330		30×50	1.40	
330		35×40	1.43	
390		35×45	1.60	
470	35×50	1.79		
500	47	22×25	0.41	
	56	22×30	0.43	
	68	22×30	0.52	
	68	25×25	0.55	
	82	22×35	0.62	
	82	25×30	0.57	
	100	22×45	0.68	
	100	25×30	0.72	
	120	22×50	0.76	
	120	25×35	0.79	
	120	30×30	0.91	
	150	25×45	1.08	
	150	30×35	1.04	
	150	35×25	0.99	
	180	25×50	1.20	
	180	30×40	1.17	
	180	35×30	1.10	
	220	30×45	1.33	
	220	35×35	1.23	
	270	30×50	1.50	
	270	35×40	1.42	
	330	35×45	1.60	
	390	35×50	1.78	
	470	35×60	2.03	



ISE2 Series:

+105°C, Load life: 3000hours.

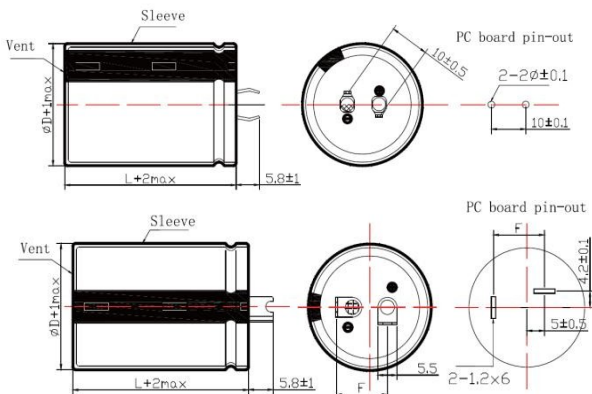
Available for switching power supplies, inverter, etc. RoHS Compliant.

SPECIFICATIONS

Items	Characteristics																						
Operating Temperature Range	-40~+105°C	-25~+105°C																					
Rated Voltage Range	16V~100Vdc	160V~550Vdc																					
Capacitance Tolerance	±20% (120Hz, +25°C)																						
Leakage Current	$I \sqrt{3} CV$ or 1.5mA, whichever is Lower.																						
	I:Max.leakage current (µA),C:Nominal capacitance (µF),V: Rated voltage (V) (at 25°C, after 5 minutes)																						
Dissipation Factor (tanδ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000µF, add 0.02 to the value above for each 1000µF increase.																						
	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>160~250</th> <th>315~400</th> <th>420~550</th> </tr> </thead> <tbody> <tr> <td>tanδ (max.)</td> <td>0.50</td> <td>0.45</td> <td>0.40</td> <td>0.35</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.20</td> <td>0.15</td> <td></td> </tr> </tbody> </table>		Rated Voltage)	16	25	35	50	63	80	100	160~250	315~400	420~550	tanδ (max.)	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.20	0.15
Rated Voltage)	16	25	35	50	63	80	100	160~250	315~400	420~550													
tanδ (max.)	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.20	0.15														
Temperature characteristics (Impedance ratio at 120Hz)	Rated Voltage)	16	25	35	50	63	80	100	160~250	315~400	420~550												
	Z(-25°C)/Z(+20°C)	4	3	3	2	2	2	2	4	8	8												
	Z(-40°C)/Z(+20°C)	15	10	8	6	6	5	5	-	-	-												
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C :																						
	<table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>≤200% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>≤The initial specified value</td> </tr> </tbody> </table>		Capacitance Change	±20% of the initial value	D.F. (tanδ)	≤200% of the initial specified value	Leakage Current	≤The initial specified value															
Capacitance Change	±20% of the initial value																						
D.F. (tanδ)	≤200% of the initial specified value																						
Leakage Current	≤The initial specified value																						
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied :																						
	Capacitance change : ±20% of the initial measured value Dissipation factor : ≤150% of the initial specified value Leakage current : ≤200% of the initial specified value																						

Size(mm)

Frequency Coefficient



WV(Vdc)	Freq.(Hz)			
	120	1K	10K	100K
16~50	1.00	1.03	1.05	1.08
63~100	1.00	1.07	1.13	1.19
160~250	1.00	1.32	1.45	1.50
315~550	1.00	1.30	1.41	1.43

ISE2 Series:

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
16	12000	25×30	2.35
	15000	25×35	2.63
	18000	25×40	3.22
	22000	25×45	3.43
	22000	30×35	3.37
	27000	25×50	3.93
	27000	30×40	3.88
	33000	30×45	4.39
	39000	30×50	4.91
	39000	35×40	4.90
	47000	35×45	5.64
25	8200	25×30	2.39
	10000	25×35	2.66
	12000	25×40	2.87
	15000	25×45	3.34
	15000	30×35	3.19
	18000	30×40	3.63
	22000	30×45	4.12
	27000	35×45	4.83
	33000	35×50	5.61
	35	5600	25×30
6800		25×35	2.36
8200		25×40	2.78
10000		25×45	3.11
10000		30×35	3.11
12000		25×50	3.44
12000		30×40	3.29
15000		30×45	3.79
18000		35×40	4.46
22000		35×45	5.02
50	4700	25×40	2.48
	5600	25×45	2.77
	10000	30×50	4.13
	15000	30×60	4.86
	15000	35×50	4.87
63	3300	22×45	2.38
	3300	22×55	2.41
	4700	25×50	3.03
	6800	30×40	3.69
	6800	30×50	3.72
	10000	30×60	4.59
	10000	35×50	4.57
	10000	35×60	4.63
	15000	35×60	4.93
18000	35×70	5.22	
80	6800	35×50	3.99
	6800	35×45	3.98
	8200	35×50	4.28
	8200	35×60	4.31
	10000	35×60	4.65
100	2200	25×45	2.58
	4700	30×60	3.88
	4700	35×45	3.88
	6800	35×60	4.05
	8200	35×70	4.25
	10000	35×70	4.35

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
200	270	22×25	1.00
	330	22×30	1.20
	330	25×25	1.20
	390	22×35	1.31
	390	25×30	1.35
	470	22×40	1.46
	470	25×30	1.46
	470	30×25	1.49
	560	22×45	1.61
	560	25×35	1.61
	560	30×30	1.63
	680	22×50	1.76
	680	25×40	1.80
	680	30×30	1.76
	820	25×45	2.14
	820	30×35	2.15
	820	35×30	2.13
	1000	25×50	2.40
	1000	30×40	2.43
	1000	35×35	2.33
	1200	30×45	2.73
	1200	35×35	2.56
	1500	35×40	3.02
	1800	35×50	3.50
220	220	22×25	0.95
	270	22×30	1.10
	330	22×35	1.24
	330	25×25	1.15
	390	22×35	1.31
	390	25×25	1.28
	470	22×40	1.43
	470	25×30	1.41
	470	30×25	1.39
	560	22×45	1.62
	560	25×35	1.58
	560	30×30	1.62
	560	35×25	1.53
	680	25×40	1.77
	680	30×35	1.79
	680	35×30	1.74
	820	25×45	2.00
	820	30×40	2.09
	820	35×30	1.97
	1000	30×45	2.48
	1000	35×35	2.22
	1200	35×40	2.40
	1500	35×45	2.66
	250	180	22×25
220		22×30	0.97
220		25×25	0.99
270		22×35	1.11
270		25×30	1.15
330		22×40	1.26
330		25×30	1.26
330		30×25	1.32
390		22×45	1.42
390		25×35	1.43
390		30×30	1.51
470		22×50	1.58
470		25×40	1.62
470		30×30	1.62
560		25×45	1.82
560		30×35	1.86
680	25×50	2.05	
680	30×40	2.11	
680	35×30	1.98	
820	30×45	2.37	

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
250	820	35×35	2.28
	1000	30×50	2.67
	1000	35×40	2.60
	1200	35×45	2.91
315	120	22×25	0.55
	150	22×30	0.66
	150	25×25	0.65
	180	22×35	0.79
	180	25×30	0.71
	220	22×40	0.90
	220	25×30	0.86
	220	30×25	0.84
	270	22×45	1.02
	270	25×35	0.99
	270	30×30	1.02
	330	22×50	1.14
	330	25×40	1.12
	330	30×35	1.22
	390	25×45	1.32
	390	30×35	1.32
	390	35×30	1.24
	470	30×40	1.55
	470	35×35	1.48
	560	30×45	1.67
	560	35×40	1.67
	680	35×45	1.98
	820	35×50	2.21
	350	100	22×25
120		2×30	0.61
120		25×25	0.62
150		22×35	0.72
150		25×30	0.72
180		22×40	0.84
180		25×30	0.80
180		30×25	0.82
220		22×45	0.94
220		25×35	0.92
220		30×30	0.99
270		22×50	1.07
270		25×40	1.05
270		30×30	1.03
330		25×45	1.24
330		30×35	1.23
330		35×30	1.20
390		25×50	1.38
390		30×40	1.41
390		35×35	1.38
470		30×45	1.58
470		35×35	1.54
560		30×50	1.77
560		35×40	1.71
680	35×45	1.98	
400	68	22×25	0.48
	82	22×30	0.55
	100	22×30	0.63
	100	25×25	0.60
	120	22×35	0.72

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)	
400	120	25×30	0.72	
	150	22×40	0.86	
	150	25×35	0.86	
	150	30×25	0.80	
	180	22×45	0.97	
	180	25×35	0.94	
	180	30×30	0.96	
	220	22×50	1.10	
	220	25×40	1.06	
	220	30×35	1.24	
	270	25×50	1.30	
	270	30×40	1.32	
	270	35×30	1.18	
	330	30×45	1.49	
	330	35×35	1.14	
	390	30×50	1.65	
	390	35×40	1.61	
	470	35×45	1.90	
	506	35×50	2.11	
	420	68	22×25	0.49
		82	22×30	0.57
		82	25×25	0.56
		100	22×30	0.63
		100	25×25	0.63
120		22×35	0.73	
120		25×30	0.71	
120		30×25	0.74	
150		22×45	0.87	
150		25×35	0.84	
150		30×25	0.84	
180		22×50	1.03	
180		25×40	0.95	
180		30×30	0.96	
180		35×25	0.89	
220		25×45	1.14	
220		30×35	1.10	
220		35×30	1.06	
270		25×50	1.38	
270		30×40	1.26	
270		35×35	1.28	
330		30×45	1.51	
330		35×35	1.44	
390		30×50	1.69	
390	35×40	1.63		
470	35×45	1.89		
450	56	22×25	0.42	
	68	22×30	0.50	
	68	25×25	0.50	
	82	22×35	0.55	
	82	25×30	0.56	
	100	22×40	0.64	
	100	25×30	0.64	
	100	30×25	0.66	
	120	22×45	0.72	
	120	25×35	0.71	
	120	30×30	0.78	
	150	22×50	0.81	
	150	25×40	0.83	
	150	30×30	0.86	
	180	25×45	0.94	
	180	30×35	0.98	
	220	25×50	1.06	
	220	30×40	1.11	
	220	35×30	1.02	
	270	30×45	1.26	

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
450	270	35×35	1.26
	330	30×50	1.43
	330	35×40	1.46
	390	35×45	1.63
	470	35×50	1.83
500	47	22×25	0.51
	56	22×30	0.58
	68	25×25	0.65
	82	22×35	0.72
	82	25×30	0.74
	100	22×45	0.83
	100	25×30	0.82
	120	22×50	0.93
	120	25×35	0.93
	120	30×30	0.91
	150	25×45	1.08
	150	30×35	1.04
	150	35×25	0.99
	180	25×50	1.20
	180	30×40	1.17
	180	35×30	1.10
	220	30×45	1.33
	220	35×35	1.23
	270	30×50	1.50
	270	35×40	1.42
330	35×45	1.60	
390	35×50	1.78	
470	35×60	2.03	
550	82	22×35	0.72
	82	25×30	0.74
	100	22×45	0.83
	100	25×35	0.85
	100	30×25	0.82
	120	22×50	0.93
	120	25×40	0.95
	120	30×30	0.91
	120	35×25	0.88
	150	25×45	1.08
	150	30×35	1.04
	180	25×50	1.20
	180	30×40	1.17
	180	35×30	1.10
	220	30×45	1.33
	220	35×35	1.23
	270	30×50	1.50
	270	35×40	1.42
	330	35×45	1.60
390	35×50	1.64	
470	35×60	2.03	



IS5 Series:

+105°C, Load life: 5000hours.

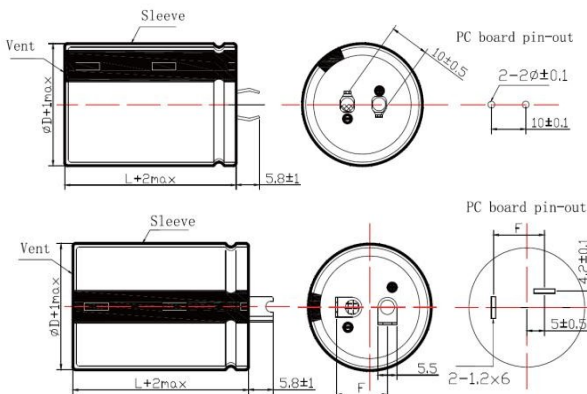
Available for switching power supplies, inverter, etc. RoHS Compliant.

SPECIFICATIONS

Items	Characteristics																						
Operating Temperature Range	-40~+105°C	-25~+105°C																					
Rated Voltage Range	16V~100Vdc	160V~550Vdc																					
Capacitance Tolerance	± 20% (120Hz, +25°C)																						
Leakage Current	$1\sqrt{3} CV$ or 1.5mA, whichever is Lower.																						
	I:Max.leakage current (µA),C:Nominal capacitance (µF),V: Rated voltage (V) (at 25°C, after 5 minutes)																						
Dissipation Factor (tanδ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000µF, add 0.02 to the value above for each 1000µF increase.																						
	<table border="1"> <thead> <tr> <th>Rated Voltage)</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>160~250</th> <th>315~400</th> <th>420~550</th> </tr> </thead> <tbody> <tr> <td>tanδ (max.)</td> <td>0.50</td> <td>0.45</td> <td>0.40</td> <td>0.35</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td></td> <td></td> </tr> </tbody> </table>		Rated Voltage)	16	25	35	50	63	80	100	160~250	315~400	420~550	tanδ (max.)	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	
Rated Voltage)	16	25	35	50	63	80	100	160~250	315~400	420~550													
tanδ (max.)	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15															
Temperature characteristics (Impedance ratio at 120Hz)	Rated Voltage)	16	25	35	50	63	80	100	160~250	315~400	420~550												
	Z(-25°C)/Z(+20°C)	6	6	6	4	3	3	3	4	8	8												
	Z(-40°C)/Z(+20°C)	15	15	10	8	6	6	6	-	-	-												
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C :																						
	<table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>≤200% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>≤The initial specified value</td> </tr> </tbody> </table>		Capacitance Change	±20% of the initial value	D.F. (tanδ)	≤200% of the initial specified value	Leakage Current	≤The initial specified value															
Capacitance Change	±20% of the initial value																						
D.F. (tanδ)	≤200% of the initial specified value																						
Leakage Current	≤The initial specified value																						
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied :																						
	Capacitance change : ±20% of the initial measured value Dissipation factor : ≤150% of the initial specified value Leakage current : ≤200% of the initial specified value																						

Size(mm)

Frequency Coefficient



WV(Vdc)	Freq.(Hz)			
	120	1K	10K	100K
16~50	1.00	1.03	1.05	1.08
63~100	1.00	1.07	1.13	1.19
160~250	1.00	1.32	1.45	1.50
315~550	1.00	1.30	1.41	1.43

IS5 Series:

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)	
16	5600	22×25	1.44	
	6800	22×30	1.66	
	6800	25×25	1.66	
	8200	22×35	1.87	
	8200	25×25	1.85	
	10000	22×40	2.12	
	10000	25×30	2.07	
	10000	30×25	2.11	
	12000	22×45	2.45	
	12000	25×35	2.37	
	12000	30×30	2.37	
	12000	35×25	2.42	
	15000	22×50	2.74	
	15000	25×40	2.71	
	15000	30×30	2.75	
	15000	35×25	2.65	
	18000	25×50	3.11	
	18000	30×35	3.02	
	18000	35×30	3.09	
	22000	30×40	3.46	
	22000	35×35	3.49	
	27000	30×50	4.07	
	27000	35×40	4.04	
	33000	35×40	4.65	
	39000	35×50	5.16	
	25	3900	22×25	1.31
		4700	22×30	1.51
		4700	25×25	1.51
5600		22×35	1.70	
5600		22×25	1.65	
6800		22×40	1.92	
6800		25×30	1.87	
6800		30×25	1.90	
8200		22×45	2.15	
8200		25×35	2.14	
8200		30×30	2.16	
8200		35×25	2.19	
10000		22×50	2.45	
10000		25×40	2.43	
10000		30×30	2.65	
10000		35×25	2.65	
12000		25×50	2.78	
12000		30×35	2.70	
12000		35×30	2.76	
15000		30×40	3.13	
15000		35×35	3.16	
18000		30×45	3.45	
18000		35×40	3.61	
27000		35×50	3.64	
33000		35×50	4.70	
35		2200	22×25	1.10
		3300	22×30	1.42
		3300	25×25	1.41
	3900	22×35	1.58	
	3900	25×30	1.58	
	4700	22×40	1.78	
	4700	25×30	1.70	
	4700	30×25	1.77	
	5600	22×45	2.15	
	5600	25×35	1.98	
	5600	30×30	1.98	
	5600	35×25	2.03	
	6800	22×50	2.26	
	6800	25×40	2.24	
	6800	30×30	2.25	

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)	
35	6800	35×25	2.35	
	8200	25×50	2.57	
	8200	30×35	2.50	
	8200	35×30	2.55	
	10000	30×40	2.86	
	10000	35×35	2.88	
	12000	30×50	3.32	
	12000	35×40	3.30	
	15000	35×45	3.75	
	18000	35×50	4.29	
	50	1500	22×25	1.02
		1800	22×30	1.17
		1800	25×25	1.17
		2200	22×35	1.33
2200		25×25	1.35	
2700		22×40	1.51	
2700		25×30	1.47	
2700		30×25	1.50	
3300		22×40	1.75	
3300		25×35	1.70	
3300		30×30	1.70	
3300		35×25	2.20	
3900		22×45	1.91	
3900		25×40	1.89	
3900		30×30	1.95	
3900		35×25	2.10	
4700		30×35	2.11	
4700		35×30	2.16	
5600		25×50	2.38	
5600		30×40	3.39	
5600	35×35	2.41		
6800	30×50	2.79		
6800	35×40	2.78		
8200	35×45	3.25		
10000	35×50	3.57		
63	1000	22×25	1.00	
	1200	22×30	1.15	
	1200	25×25	1.15	
	1500	22×35	1.32	
	1500	25×25	1.35	
	1800	22×40	1.49	
	1800	25×30	1.45	
	1800	30×25	1.48	
	2700	22×50	1.92	
	2700	25×40	1.90	
	2700	30×35	1.93	
	2700	35×25	1.95	
	3300	25×45	2.20	
	3300	30×35	2.35	
	3300	35×30	2.18	
	3900	25×50	2.35	
	3900	30×40	2.41	
	3900	35×35	2.43	
	4700	30×50	2.80	
	4700	35×40	2.78	
5600	35×40	2.95		
6800	35×45	3.25		
8200	35×50	3.55		

IS5 Series

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
80	680	22×25	0.97
	820	22×30	1.12
	10000	22×35	1.70
	10000	25×25	1.36
	1500	22×40	1.80
	1500	25×35	1.62
	1500	30×25	1.65
	1800	22×40	1.82
	1800	25×35	1.85
	1800	30×30	1.78
	1800	35×25	1.82
	2200	25×50	2.11
	2200	30×35	2.05
	2200	35×30	2.09
	2700	30×40	3.35
	2700	35×35	2.65
	3300	30×50	2.75
	3300	35×40	2.73
	4700	35×50	3.46
	100	390	22×25
560		22×30	0.99
560		25×25	0.98
680		22×35	1.12
680		25×25	1.05
820		22×40	1.26
820		25×30	1.23
820		30×25	1.25
1000		22×45	1.41
1000		25×35	1.45
1000		30×30	1.42
1000		35×25	1.45
1500		25×50	1.86
1500		30×40	1.87
1500		35×30	1.85
1800		30×40	1.95
1800		35×35	2.07
2200		30×50	2.40
2200		35×40	2.39
2700		35×50	2.81
160	390	22×30	1.42
	470	22×35	1.62
	560	22×40	1.77
	560	25×30	1.81
	560	30×25	1.81
	680	22×45	1.98
	680	25×35	2.01
	680	30×30	1.96
	820	22×50	2.20
	820	25×40	2.24
	820	30×35	2.20
	1000	25×45	2.55
	1000	30×40	2.55
	1500	30×50	3.22
	1500	35×35	3.22
	1800	30×50	3.53
	1800	35×40	3.66
	2200	35×45	4.41
	2700	35×50	4.68

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)	
200	270	22×30	1.10	
	330	22×35	1.25	
	390	22×40	1.38	
	390	25×30	1.39	
	470	22×45	1.55	
	470	25×35	1.55	
	560	22×50	1.73	
	560	25×40	1.73	
	680	25×45	1.89	
	680	30×35	1.89	
	680	35×30	1.89	
	820	25×50	2.22	
	820	30×40	2.22	
	820	35×35	2.20	
	1000	30×45	2.53	
	1000	35×40	2.69	
	1500	35×50	3.34	
	250	220	22×30	1.09
		270	22×35	1.28
		330	22×40	1.40
330		25×30	1.42	
390		22×45	1.58	
390		25×35	1.53	
390		30×30	1.52	
470		22×55	1.79	
470		25×40	1.67	
470		30×35	1.75	
560		25×45	1.98	
560		30×35	1.95	
680		25×50	2.21	
680		30×40	2.18	
680		35×30	2.15	
820		30×45	2.45	
820		35×35	2.38	
1000		30×50	2.68	
1000		35×40	2.72	
1500		35×50	3.49	
350	120	22×30	0.78	
	150	22×35	0.90	
	180	22×40	1.01	
	180	25×30	1.01	
	220	22×45	1.15	
	220	25×35	1.15	
	220	30×30	1.15	
	270	22×50	1.25	
	270	25×40	1.25	
	270	30×30	1.25	
	270	35×25	1.25	
	330	25×45	1.43	
	330	30×35	1.43	
	330	35×30	1.43	
	390	25×50	1.61	
	390	30×40	1.60	
	390	35×30	1.61	
	470	30×45	1.81	
	470	35×35	1.83	
	560	30×50	2.00	
560	35×40	2.07		
680	35×45	2.34		
820	35×50	2.62		

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
400	100	22×30	0.71
	120	22×35	0.80
	150	22×40	0.91
	150	25×35	0.91
	150	30×25	0.91
	180	22×45	1.00
	180	25×40	1.00
	180	30×30	1.00
	220	22×50	1.15
	220	25×45	1.15
	220	30×35	1.15
	270	25×50	1.35
	270	30×35	1.35
	330	30×45	1.55
	330	35×30	1.55
	390	30×45	1.68
	390	35×35	1.68
	470	30×50	1.90
	470	35×40	1.90
	560	35×45	2.12
680	35×50	2.39	
420	100	22×30	0.71
	120	22×35	0.80
	120	25×30	0.80
	150	22×40	0.91
	150	25×35	0.91
	180	22×45	1.00
	180	25×40	1.00
	180	30×30	1.00
	220	25×45	1.20
	220	30×35	1.20
	270	25×50	1.35
	270	30×35	1.35
	270	35×30	1.35
	330	30×45	1.50
	330	35×35	1.54
	390	30×50	1.72
	390	35×40	1.73
	470	35×45	1.94
	560	35×50	2.17
	450	82	22×30
100		22×35	0.75
100		25×30	0.75
120		22×40	0.78
120		25×35	0.78
150		22×45	0.95
150		25×35	0.95
150		30×30	0.95
180		22×50	0.97
180		25×40	0.95
180		30×30	0.93
180		35×25	0.96
220		25×45	1.16
220		30×35	1.17
220		35×30	1.24
270		25×50	1.31
270		30×40	1.33
270		35×30	1.39
330		30×45	1.58
330		35×35	1.58
390	30×50	1.73	
390	35×40	1.73	
470	35×50	1.98	
560	35×50	2.16	
680	35×60	2.57	

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)	
450	820	35×70	3.00	
	100	30×25	0.82	
	120	30×30	0.91	
	120	35×25	0.88	
	150	30×35	1.04	
	180	30×40	1.17	
	180	35×30	1.10	
	220	30×45	1.33	
	220	35×35	1.23	
	270	30×50	1.50	
	270	35×40	1.42	
	330	35×45	1.60	
	390	35×50	1.78	
	470	35×60	2.03	
	500	120	30×30	0.91
		150	30×35	1.04
		180	30×40	1.17
180		35×30	1.10	
220		30×50	1.35	
220		35×40	1.28	
270		35×45	1.45	
330		35×50	1.64	
390		35×60	1.85	
550		120	30×30	0.91
		150	30×35	1.04
		180	30×40	1.17
		180	35×30	1.10
		220	30×50	1.35
		220	35×40	1.28
		270	35×45	1.45
		330	35×50	1.64
	390	35×60	1.85	



IS7 Series:

+105°C, Load life: 7000hours.

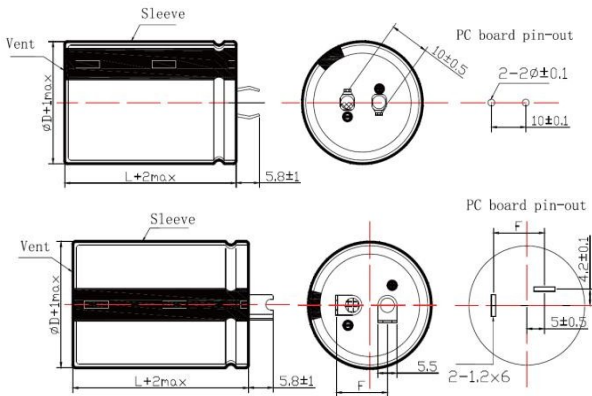
Available for switching power supplies, inverter, etc. RoHS Compliant.

SPECIFICATIONS

Items	Characteristics																				
Operating Temperature Range	-25~+105°C																				
Rated Voltage Range	160V~450Vdc																				
Capacitance Tolerance	± 20% (120Hz, +25°C)																				
Leakage Current	$I \sqrt{3} CV$ or 1.5mA, whichever is Lower. I:Max.leakage current (µA),C:Nominal capacitance (µF),V: Rated voltage (V) (at 25°C, after 5 minutes)																				
Dissipation Factor (tanδ) (+25°C, 120Hz)	When nominal capacitance exceeds 1000µF, add 0.02 to the value above for each 1000µF increase. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Rated Voltage)</th> <th>160</th> <th>200</th> <th>220</th> <th>250</th> <th>315</th> <th>350</th> <th>400</th> <th>420</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>tanδ (max.)</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> </tr> </tbody> </table>	Rated Voltage)	160	200	220	250	315	350	400	420	450	tanδ (max.)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Rated Voltage)	160	200	220	250	315	350	400	420	450												
tanδ (max.)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15												
Temperature characteristics (Impedance ratio at 120Hz)	<table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Rated Voltage)</th> <th>160</th> <th>200</th> <th>220</th> <th>250</th> <th>315</th> <th>350</th> <th>400</th> <th>420</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+25°C)</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>8</td> <td>8</td> <td>8</td> <td>8</td> <td>8</td> </tr> </tbody> </table>	Rated Voltage)	160	200	220	250	315	350	400	420	450	Z(-25°C)/Z(+25°C)	4	4	4	4	8	8	8	8	8
Rated Voltage)	160	200	220	250	315	350	400	420	450												
Z(-25°C)/Z(+25°C)	4	4	4	4	8	8	8	8	8												
Load Life	The following specifications shall be satisfied when the capacitors are restored to 25°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C : <table border="1" style="margin: 10px auto;"> <tbody> <tr> <td>Capacitance Change</td> <td>±20% of the initial value</td> </tr> <tr> <td>D.F. (tanδ)</td> <td>≤200% of the initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>≤The initial specified value</td> </tr> </tbody> </table>	Capacitance Change	±20% of the initial value	D.F. (tanδ)	≤200% of the initial specified value	Leakage Current	≤The initial specified value														
Capacitance Change	±20% of the initial value																				
D.F. (tanδ)	≤200% of the initial specified value																				
Leakage Current	≤The initial specified value																				
ShelfLife	The following specifications shall be satisfied when the capacitors are restored to 25°C after exposing them for 1,000 hours at 105°C without voltage applied : Capacitance change : ±20% of the initial measured value Dissipation factor : ≤150% of the initial specified value Leakage current : ≤200% of the initial specified value																				

Size(mm)

Frequency Coefficient



WV(Vdc) \ Freq.(Hz)	120	1K	10K	100K
16~50	1.00	1.03	1.05	1.08
63~100	1.00	1.07	1.13	1.19
160~250	1.00	1.32	1.45	1.50
315~550	1.00	1.30	1.41	1.43

IS7 Series:

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
160	330	22×25	1.11
	390	22×30	1.26
	470	22×30	1.39
	470	25×25	1.38
	560	22×35	1.55
	560	25×30	1.55
	680	22×40	1.75
	680	25×35	1.78
	680	30×25	1.74
	820	22×50	1.97
	820	25×40	2.01
	820	30×30	1.96
	1000	25×45	2.27
	1000	30×35	2.26
	1200	25×50	2.54
	1200	30×40	2.56
	1200	35×30	2.52
	1500	30×45	2.96
	1500	35×35	2.89
	1800	30×50	3.32
1800	35×40	3.30	
2200	35×50	3.87	
200	220	22×25	0.90
	270	22×30	1.05
	330	22×30	1.16
	330	25×25	1.16
	390	22×35	1.29
	390	25×30	1.29
	470	22×40	1.46
	470	25×30	1.42
	470	30×25	1.45
	560	22×45	1.63
	560	25×35	1.62
	560	30×30	1.62
	680	25×40	1.83
	680	30×30	1.79
	820	25×45	2.06
	820	30×35	2.04
	1000	30×45	2.42
	1000	35×30	2.30
	1200	30×50	2.71
	1200	35×40	2.70
1500	35×45	3.11	
1800	35×50	3.50	
220	220	22×25	0.90
	270	22×30	1.05
	330	22×35	1.19
	330	25×25	1.16
	390	22×40	1.33
	390	25×30	1.29
	470	22×45	1.49
	470	25×35	1.48
	470	30×25	1.45
	560	22×50	1.63
	560	25×40	1.71
	560	30×30	1.62
	680	25×45	1.87
	680	30×35	1.86
	820	25×50	2.10
	820	30×40	2.12
	820	35×30	2.08
	1000	30×50	2.48
	1000	35×40	2.46
	1200	35×45	2.78
1500	35×50	3.20	

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
250	180	22×25	0.82
	220	22×30	0.95
	270	22×35	1.08
	270	25×25	1.05
	330	22×40	1.22
	330	25×30	1.19
	390	22×45	1.36
	390	25×35	1.35
	390	30×25	1.32
	470	22×50	1.49
	470	25×40	1.52
	470	30×30	1.49
	560	25×45	1.70
	560	30×35	1.69
	680	25×50	1.91
	680	30×40	1.93
	680	35×30	1.90
	820	30×45	2.19
	820	35×35	2.13
	1000	35×40	2.46
1200	35×50	2.86	
315	100	22×25	0.67
	120	22×30	0.77
	150	22×30	0.86
	150	25×25	0.85
	180	22×35	0.96
	180	25×30	0.96
	220	22×40	1.09
	220	25×30	1.06
	220	30×25	1.08
	270	22×45	1.24
	270	25×35	1.23
	270	30×30	1.23
	330	25×40	1.40
	330	30×35	1.42
	330	35×30	1.45
	390	25×50	1.59
	390	30×35	1.54
	390	35×30	1.57
	470	30×45	1.81
	470	35×35	1.77
560	30×50	2.03	
560	35×40	2.02	
680	35×45	2.29	
820	35×50	2.59	
350	100	22×25	0.67
	120	22×30	0.77
	120	25×25	0.76
	150	22×35	0.88
	150	25×30	0.88
	180	22×40	0.99
	180	25×30	0.96
	180	30×25	0.98
	220	22×45	1.12
	220	25×35	1.11
	220	30×30	1.11
	270	25×40	1.26
	270	30×35	1.28
	330	25×45	1.40
	330	30×35	1.42
	330	35×30	1.45
	390	30×40	1.60
	390	35×35	1.61
	470	30×50	1.86
	470	35×40	1.85
560	35×40	2.02	
680	35×50	2.36	

IS7 Series:

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
400	68	22×25	0.55
	82	22×30	0.63
	100	22×30	0.70
	100	25×25	0.70
	120	22×35	0.79
	120	25×30	0.79
	150	22×40	0.90
	150	25×30	0.88
	105	30×25	0.90
	180	22×45	0.99
	180	25×35	1.01
	180	30×30	1.01
	220	25×40	1.14
	220	30×35	1.16
	270	25×50	1.32
	270	30×40	1.33
	270	35×30	1.31
	330	30×45	1.52
	330	35×35	1.48
	390	30×50	1.69
	390	35×40	1.68
	470	35×45	1.91
	560	35×50	2.14
	420	56	22×25
68		22×30	0.58
82		22×30	0.63
82		25×25	0.63
100		22×35	0.72
100		25×30	0.72
120		22×40	0.81
120		25×30	0.79
120		30×25	0.80
150		22×45	0.92
150		25×35	0.92
150		30×30	0.92
180		25×40	1.03
180		30×35	1.05
220		25×50	1.19
220		30×35	1.16
220		35×30	1.18
270		30×45	1.38
270		35×35	1.34
330		30×50	1.56
330		35×40	1.55
390		35×45	1.74
470		35×50	1.96
450		47	22×25
	56	22×30	0.52
	68	22×30	0.58
	68	25×25	0.58
	82	22×35	0.65
	82	25×30	0.65
	100	22×40	0.74
	100	25×30	0.72
	100	30×25	0.73
	120	22×45	0.83
	120	25×35	0.82
	120	30×30	0.82
	150	25×40	0.94
	150	30×35	0.96
	180	25×45	1.06
	180	30×35	1.05
	180	35×30	1.07
	220	30×40	1.20
	220	35×35	1.21
	270	30×50	1.41

Rated Voltage(V)	CAP(uF)	Size ØDXL(mm)	Ripple (A)
450	270	35×40	1.40
	330	35×45	1.60
	390	35×50	1.79

ICST Series:



+85°C, Load life: 2000hours.

Used large power source, Uninterruptible power supplies, Frequency converter circuit, etc. RoHS Compliant.

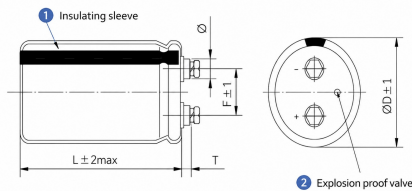
Items	Characteristics		
Operating Temperature Range	-25~+85°C		
Rated Voltage Range	10V~500Vdc		
Capacitance Tolerance	± 20% (120Hz, +25°C)		
Leakage Current	I≤0.02CV		
	I:Max.leakage current (µA),C:Nominal capacitance (µF),V: Rated voltage (V) (at 25°C, after 5 minutes)		
Dissipation Factor (tanδ) (+25°C, 120Hz)	Less than values shown in the standard ratings		
Temperature characteristics (Impedance ratio at 120Hz)	Rated Voltage)	10~100	160~500
	Z(-25°C)/Z(+20°C)	4	8
Load Life	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 a specified period of time at 85°C :		
	Capacitance Change	20% of the initial value	
	D.F. (tanδ)	≤200% of the initial specified value	
	Leakage Current	≤The initial specified value	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied :		
	Capacitance change : ±20% of the initial measured value Leakage current : ≤200% of the initial specified value Dissipation factor : ≤200% of the initial specified value		

Size

Size(mm)

Frequency Coefficient

Freq.(Hz)	50/60	120	300	1K	≥10K
WV(Vdc)	0.70	1.00	1.10	1.30	1.40



ICST Series:

Rated Voltage	Rated Capacitance	Dissipation Factor 20°C120Hz	Rated Ripple Current 85°C 120Hz	Size φD×L
(V)	(uF)	tanδ	(A rms)	(mm)
10	33000	0.80	4.30	35×53
	39000	0.80	4.70	35×53
	47000	0.80	5.20	35×65
	56000	0.80	6.10	35×83
	68000	0.80	6.70	35×83
	82000	0.80	7.70	35×100
	100000	0.80	8.80	35×100
	120000	0.80	10.00	35×121
	150000	1.00	10.80	35×121
	180000	1.00	12.00	50.8×96
	220000	1.50	11.20	50.8×121
	270000	1.50	12.80	50.8×121
	330000	1.50	15.30	63.5×96
	390000	1.50	17.30	63.5×115
	470000	2.00	16.70	63.5×130
	560000	2.00	19.00	76×115
680000	2.00	21.70	76×130	
820000	2.00	24.70	76×155	
16	22000	0.60	4.10	35×53
	27000	0.60	4.50	35×53
	33000	0.60	5.00	35×53
	39000	0.60	5.90	35×65
	47000	0.60	6.40	35×83
	56000	0.60	7.30	35×83
	68000	0.60	8.40	35×100
	82000	0.80	8.30	35×100
	100000	0.80	9.50	35×121
	120000	0.80	10.90	35×121
	150000	1.00	11.30	50.8×96
	180000	1.00	12.80	50.8×115
	220000	1.00	15.30	50.8×130
	270000	1.00	17.60	63.5×96
	330000	1.50	16.80	63.5×115
	390000	1.50	18.30	63.5×130
470000	1.50	21.30	76×115	
560000	1.50	23.60	76×130	
680000	1.50	27.60	76×155	
820000	2.00	27.10	90×157	
25	15000	0.50	3.70	35×53
	18000	0.50	4.10	35×53
	22000	0.50	4.50	35×53
	27000	0.50	5.00	35×65
	33000	0.50	5.90	35×83
	39000	0.50	6.70	35×83
	47000	0.50	7.70	35×100
	56000	0.60	7.90	35×100
	68000	0.60	9.20	35×121
	82000	0.60	10.40	35×121
	100000	0.60	10.30	50.8×96
	120000	0.80	11.70	50.8×115
	150000	0.80	14.10	50.8×130
	180000	0.80	15.70	63.5×96
	220000	1.00	16.10	63.5×115
	270000	1.00	18.60	63.5×130
330000	1.00	21.90	63.5×155	
390000	1.20	22.00	76×115	
470000	1.20	25.60	76×155	
560000	1.20	27.90	90×131	
680000	1.20	32.50	90×157	

Rated Voltage	Rated Capacitance	Dissipation Factor 20°C120Hz	Rated Ripple Current 85°C 120Hz	Size φD×L
(V)	(uF)	tanδ	(A rms)	(mm)
35	10000	0.40	3.40	35×53
	12000	0.40	3.70	35×53
	15000	0.40	4.20	35×65
	18000	0.40	4.70	35×83
	22000	0.40	5.70	35×83
	27000	0.40	6.30	35×100
	33000	0.40	7.20	35×100
	39000	0.50	2.30	35×121
	47000	0.50	8.70	50.8×96
	56000	0.60	8.60	50.8×96
	68000	0.60	9.80	50.8×115
	82000	0.60	11.60	63.5×96
	100000	0.60	13.30	63.5×115
	120000	0.80	14.80	63.5×121
	150000	0.80	14.90	63.5×130
	180000	0.80	17.00	76×115
220000	0.80	20.00	76×130	
270000	0.80	20.30	76×155	
330000	0.80	23.50	90×131	
390000	0.80	26.40	90×157	
470000	0.80	29.60	90×157	
50	5600	0.30	3.00	35×53
	6800	0.30	3.30	35×53
	8200	0.30	3.60	35×53
	10000	0.30	4.00	35×65
	12000	0.30	4.70	35×83
	15000	0.30	5.50	35×83
	18000	0.30	6.20	35×100
	22000	0.40	6.30	35×121
	27000	0.40	7.10	35×121
	33000	0.40	8.20	50.8×96
	39000	0.50	8.10	50.8×96
	47000	0.50	9.30	50.8×115
	56000	0.50	10.50	63.5×96
	68000	0.50	12.00	63.5×96
	82000	0.50	13.70	63.5×115
	100000	0.60	14.70	76×115
120000	0.60	16.70	76×115	
150000	0.60	19.30	76×130	
180000	0.60	21.90	76×155	
220000	0.60	21.40	89×131	
270000	0.60	24.60	89×157	
63	3900	0.25	2.70	35×53
	4700	0.25	3.00	35×53
	5600	0.25	3.30	35×53
	6800	0.25	3.60	35×65
	8200	0.25	4.30	35×83
	10000	0.25	4.90	35×83
	12000	0.25	5.60	35×100
	15000	0.30	5.90	35×100
	18000	0.30	6.70	35×121
	22000	0.30	7.80	35×121
	27000	0.40	7.40	50.8×96
	33000	0.40	8.40	50.8×96
	39000	0.40	9.50	50.8×115
	47000	0.40	11.30	50.8×130

ICST Series:

Rated Voltage	Rated Capacitance	Dissipation Factor 20°C120Hz	Rated Ripple Current 85°C 120Hz	Size φD×L
(V)	(uF)	tanδ	(A rms)	(mm)
63	56000	0.40	12.80	63.5×115
	68000	0.50	12.70	63.5×121
	82000	0.50	14.50	63.5×130
	100000	0.50	16.70	76×115
	120000	0.50	18.90	76×130
	150000	0.50	22.40	76×155
	180000	0.60	22.40	90×131
	220000	0.60	26.20	90×157
80	3300	0.25	2.50	35×53
	3900	0.25	2.80	35×53
	4700	0.25	3.00	35×65
	5600	0.25	3.60	35×83
	6800	0.25	3.90	35×83
	8200	0.25	4.50	35×83
	10000	0.25	5.20	35×100
	15000	0.25	6.80	35×121
	18000	0.25	7.80	35×121
	22000	0.3	8.00	50.8×96
	27000	0.3	9.20	50.8×96
	33000	0.3	10.50	50.8×115
	39000	0.3	12.00	50.8×130
	47000	0.3	13.60	63.5×115
	56000	0.4	13.40	63.5×130
	68000	0.4	15.40	76×115
	82000	0.4	17.50	76×130
	100000	0.4	20.50	76×155
120000	0.4	22.40	89×131	
150000	0.4	26.50	89×157	
100	1800	0.25	1.90	35×53
	2200	0.25	2.10	35×53
	2700	0.25	2.30	35×53
	3300	0.25	2.60	35×65
	3900	0.25	3.00	35×83
	4700	0.25	3.50	35×83
	5600	0.25	3.90	35×100
	6800	0.25	4.50	35×100
	8200	0.25	5.10	35×121
	10000	0.25	5.90	35×121
	15000	0.25	7.00	50.8×96
	18000	0.25	8.30	50.8×115
	22000	0.25	10.00	50.8×130
	33000	0.25	11.90	63.5×130
	39000	0.25	13.40	76×115
	47000	0.35	14.20	76×130
	56000	0.35	16.00	76×155
	68000	0.35	18.80	89×131
82000	0.35	20.50	89×157	
100000	0.35	24.00	89×171	

Rated Voltage	Rated Capacitance	Dissipation Factor 20°C120Hz	Rated Ripple Current 85°C 120Hz	Size φD×L	
(V)	(uF)	tanδ	(A rms)	(mm)	
160	3300	0.25	5.20	35×121	
	3900	0.25	5.30	50.8×75	
	4700	0.25	5.90	50.8×75	
	5600	0.25	7.00	50.8×96	
	6800	0.25	7.80	50.8×96	
	8200	0.25	9.10	50.8×115	
	10000	0.25	10.40	63.5×96	
	12000	0.25	11.30	63.5×96	
	15000	0.25	14.30	63.5×130	
	18000	0.25	15.60	63.5×130	
	22000	0.25	18.30	76×130	
	27000	0.25	20.20	76×130	
	33000	0.25	23.80	89×131	
	39000	0.25	27.90	89×157	
	200	2200	0.25	3.90	35×100
		2700	0.25	4.70	35×121
		3300	0.25	4.90	50.8×75
		3900	0.25	5.30	50.8×75
4700		0.25	6.40	50.8×96	
5600		0.25	7.60	50.8×115	
6800		0.25	8.80	50.8×130	
8200		0.25	9.40	63.5×96	
10000		0.25	10.40	63.5×96	
15000		0.25	14.40	76×96	
18000		0.25	16.50	76×130	
22000		0.25	19.60	76×155	
27000		0.25	21.50	89×131	
33000		0.25	25.30	89×157	
250		1500	0.25	3.20	35×100
		1800	0.25	3.50	35×100
		2200	0.25	4.00	50.8×75
		2700	0.25	4.40	50.8×75
	3300	0.25	5.40	50.8×96	
	3900	0.25	6.30	50.8×115	
	4700	0.25	7.10	63.5×96	
	5600	0.25	7.80	63.5×96	
	6800	0.25	9.10	63.5×115	
	8200	0.25	10.00	63.5×115	
	10000	0.25	11.70	63.5×130	
	12000	0.25	12.90	76×115	
15000	0.25	15.10	76×130		
18000	0.25	17.70	76×155		
22000	0.25	20.90	89×157		

ICST Series:

Rated Voltage	Rated Capacitance	Dissipation Factor 20°C 120Hz	Rated Ripple Current 85°C 120Hz	Size φD×L
(V)	(uF)	tanδ	(A rms)	(mm)
350	390	0.20	1.70	35×53
	470	0.20	2.20	35×83
	560	0.20	2.40	35×83
	680	0.20	2.60	35×83
	820	0.20	3.10	35×100
	1000	0.20	3.40	35×100
	1200	0.20	3.80	50.8×75
	1500	0.20	4.30	50.8×75
	1800	0.20	5.10	50.8×96
	2200	0.20	5.70	50.8×96
	2700	0.20	7.10	50.8×130
	3300	0.20	7.90	50.8×130
	3900	0.20	0.90	63.5×115
	4700	0.20	10.30	63.5×130
	5600	0.20	11.40	76×115
	6800	0.20	13.10	76×130
	8200	0.20	15.40	76×155
	10000	0.20	18.10	89×157
	12000	0.20	20.00	89×157
	15000	0.20	24.50	89×196
18000	0.20	28.80	89×236	
400	330	0.20	1.50	35×53
	390	0.20	2.00	35×83
	470	0.20	2.20	35×83
	560	0.20	2.40	35×83
	680	0.20	2.80	35×100
	820	0.20	3.10	35×100
	1000	0.20	3.50	50.8×75
	1200	0.20	3.80	50.8×75
	1500	0.20	4.70	50.8×96
	1800	0.20	5.20	50.8×96
	2200	0.20	6.40	50.8×120
	2700	0.20	7.00	63.5×96
	3300	0.20	8.20	63.5×115
	3900	0.20	9.40	63.5×130
	4700	0.20	10.40	76×115
	5600	0.20	11.90	76×130
	6800	0.20	14.10	76×155
	8200	0.20	16.40	89×157
	1000	0.20	18.30	89×157
	1200	0.20	21.80	89×196
1500	0.20	26.30	89×236	
450	270	0.20	1.40	35×53
	330	0.20	1.80	35×83
	390	0.20	2.00	35×83
	470	0.20	2.20	35×83
	560	0.20	2.60	35×100
	680	0.20	2.80	35×100
	820	0.20	3.20	50.8×75
	1000	0.20	3.50	50.8×75
	1200	0.20	4.20	50.8×96
	1500	0.20	5.00	50.8×115
	1800	0.20	5.90	50.8×130
	2200	0.20	6.30	63.5×96
	2700	0.20	7.50	63.5×115
	3300	0.20	8.70	63.5×115
	3900	0.20	9.50	76×115
	4700	0.20	10.90	76×130
	5600	0.20	12.80	76×155
	6800	0.20	15.00	89×157
	8200	0.20	16.50	89×157
	10000	0.20	20.00	89×196
12000	0.20	23.60	89×236	

Rated Voltage	Rated Capacitance	Dissipation Factor 20°C 120Hz	Rated Ripple Current 85°C 120Hz	Size φD×L
(V)	(uF)	tanδ	(Arms)	(mm)
500	1200	0.20	6.20	50.8×115
	1200	0.20	6.30	63.5×96
	1500	0.20	7.30	50.8×130
	1500	0.20	7.10	63.5×96
	1800	0.20	8.30	63.5×115
	2200	0.20	9.60	63.5×130
	2700	0.20	10.70	76×115
	3300	0.20	12.40	76×130
	3900	0.20	14.40	76×155
	4700	0.20	16.50	76×171
	4700	0.20	15.80	89×131
	5600	0.20	19.00	76×195
	5600	0.20	18.60	89×157
	6800	0.20	21.20	89×171
	8200	0.20	24.50	89×196
	8200	0.20	24.20	100×175
	10000	0.20	29.30	89×236
	10000	0.20	27.90	100×195
	12000	0.20	33.10	100×237

ICST2 Series:



+105°C, Load life: 2000hours.

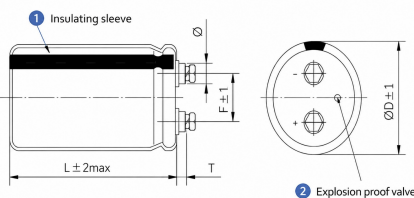
Used large power source, Uninterruptible power supplies, Frequency converter circuit, etc. RoHS Compliant.

Items	Characteristics		
Operating Temperature Range	-25~+85°C		
Rated Voltage Range	10V~500Vdc		
Capacitance Tolerance	± 20% (120Hz, +25°C)		
Leakage Current	I≤0.02CV		
	I:Max.leakage current (µA),C:Nominal capacitance (µF),V: Rated voltage (V) (at 25°C, after 5 minutes)		
Dissipation Factor (tanδ) (+25°C, 120Hz)	Less than values shown in the standard ratings		
Temperature characteristics (Impedance ratio at 120Hz)	Rated Voltage)	25~100	160~450
	Z(-25°C)/Z(+25°C)	4	8
Load Life	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 a specified period of time at 85°C :		
	Capacitance Change	20% of the initial value	
	D.F. (tanδ)	≤200% of the initial specified value	
	Leakage Current	≤The initial specified value	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied :		
	Capacitance change : ±20% of the initial measured value		
	Leakage current : ≤200% of the initial specified value		
	Dissipation factor : ≤200% of the initial specified value		

Size (mm)

Frequency Coefficient

Freq.(Hz)	50/60	120	300	1K	≥10K
WV(Vdc)	0.70	1.00	1.10	1.30	1.40
10~500					



ICST2 Series:

Rated Voltage	Rated Capacitance	Dissipation Factor 20°C 120Hz	Rated Ripple Current 105°C 120Hz	Size φD×L
(V)	(uF)	tanδ	(A rms)	(mm)
25	10000	0.35	2.90	35×53
	15000	0.35	4.20	35×83
	22000	0.35	5.10	35×83
	33000	0.40	6.30	35×100
	47000	0.40	8.00	50.8×75
	68000	0.50	10.00	50.8×115
	100000	0.60	11.30	63.5×96
	150000	0.80	12.90	63.5×115
	220000	1.00	14.80	76×115
35	330000	1.00	19.90	89×131
	6800	0.30	2.60	35×53
	10000	0.30	3.70	35×83
	15000	0.30	4.50	35×83
	22000	0.35	5.50	35×100
	33000	0.40	6.70	50.8×75
	47000	0.45	8.10	50.8×96
	68000	0.50	10.00	50.8×155
	100000	0.60	12.10	63.5×115
50	150000	0.70	13.80	76×115
	220000	0.70	17.60	89×131
	3300	0.20	2.20	35×53
	4700	0.25	3.30	35×53
	6800	0.25	3.40	35×83
	10000	0.25	4.10	35×83
	15000	0.30	4.90	35×100
	22000	0.35	5.90	50.8×75
	33000	0.40	7.80	50.8×115
63	47000	0.40	9.50	63.5×96
	68000	0.45	11.60	63.5×115
	100000	0.50	14.10	76×115
	150000	0.50	18.90	89×131
	2200	0.15	2.10	35×53
	3300	0.20	2.20	35×53
	4700	0.20	3.10	35×83
	6800	0.20	3.70	35×83
	10000	0.25	4.40	35×100
80	15000	0.25	5.70	50.8×75
	22000	0.30	6.80	50.8×96
	33000	0.30	9.20	63.5×96
	47000	0.35	10.90	63.5×115
	68000	0.40	13.00	76×115
	100000	0.40	17.20	89×131
	2200	0.15	2.10	35×53
	3300	0.15	3.00	35×83
	4700	0.15	3.60	35×83
100	6800	0.20	4.00	35×100
	10000	0.20	5.20	50.8×75
	15000	0.25	6.20	50.8×96
	22000	0.25	8.20	63.5×96
	33000	0.30	9.70	76×96
	47000	0.30	12.50	76×115
	68000	0.30	16.40	89×131
	1000	0.15	1.40	35×53
	1500	0.15	1.70	35×53
100	2200	0.15	2.50	35×83
	3300	0.15	3.00	35×83
	4700	0.15	3.90	35×100
	6800	0.15	5.00	50.8×75
	10000	0.15	6.50	50.8×96

Rated Voltage	Rated Capacitance	Dissipation Factor 20°C 120Hz	Rated Ripple Current 105°C 120Hz	Size φD×L	
(V)	(uF)	tanδ	(A rms)	(mm)	
100	15000	0.20	7.60	63.5×96	
	22000	0.20	9.70	76×96	
	33000	0.25	11.80	76×130	
	47000	0.25	15.00	89×131	
160	470	0.15	1.00	35×53	
	680	0.15	1.10	35×53	
	1000	0.15	1.70	35×83	
	1500	0.15	2.00	35×83	
	2200	0.15	2.70	35×100	
	3300	0.15	3.50	50.8×83	
	4700	0.15	4.40	50.8×96	
	6800	0.15	5.90	63.5×96	
	10000	0.15	7.60	76×96	
	15000	0.15	10.30	76×130	
	22000	0.15	13.20	89×131	
200	330	0.15	0.80	35×53	
	470	0.15	1.00	35×53	
	680	0.15	1.10	35×83	
	1000	0.15	1.70	35×100	
	1500	0.15	2.20	50.8×75	
	2200	0.15	2.80	50.8×96	
	3300	0.15	3.70	50.8×96	
	4700	0.15	4.90	63.5×115	
	6800	0.15	6.30	63.5×115	
	10000	0.15	8.10	76×155	
	15000	0.15	10.90	89×157	
	250	330	0.15	0.80	35×53
		470	0.15	1.00	35×53
		680	0.15	1.40	35×83
1000		0.15	1.90	35×100	
1500		0.15	2.30	50.8×75	
2200		0.15	3.10	50.8×96	
3300		0.15	4.20	63.5×96	
4700		0.15	5.40	63.5×115	
6800		0.15	6.90	76×115	
10000		0.15	9.30	76×155	
15000		0.15	12.20	89×157	
400		1000	0.15	2.50	50.8×75
		1200	0.15	3.00	50.8×96
	1500	0.15	3.60	50.8×115	
	1800	0.15	4.10	50.8×130	
	2200	0.15	4.50	63.5×96	
	2700	0.15	5.30	63.5×115	
	3300	0.15	6.20	63.5×130	
	3900	0.15	7.20	63.5×155	
	3900	0.15	6.80	76×115	
	4700	0.15	8.70	63.5×195	
	4700	0.15	7.80	76×130	
	5600	0.15	9.60	63.5×195	
	5600	0.15	9.20	76×155	
	6800	0.15	10.70	89×157	
8200	0.15	11.80	89×157		
10000	0.15	14.10	89×196		
450	220	0.15	1.10	35×53	
	330	0.15	1.50	35×100	
	470	0.15	2.10	50.8×83	
	680	0.15	2.70	50.8×96	
	1000	0.15	4.20	50.8×100	
	1500	0.15	5.70	50.8×130	
	2200	0.15	7.30	63.5×115	

Rated Voltage	Rated Capacitance	Dissipation Factor 20°C 120Hz	Rated Ripple Current 105°C 120Hz	Size φD×L
(V)	(uF)	tanδ	(A rms)	(mm)
450	3300	0.15	10.10	76×130
	4700	0.15	12.60	76×155
	5600	0.15	15.80	89×157