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**SANYO**

Aluminum Electrolytic Capacitors

2007-10

# **ELECTROLYTIC CAPACITORS**



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IATF Certificate No. 0019439

### Series integration

On new order, please order from Integrated series.

Discontinued series	Integrated series	Feature
CE-GS	CE-GA	Surface mount type, 5.4mm height, low impedance
CE-GX	CE-AX	Surface mount type, low impedance, high-reliability
CE-FC	CE-FD	Surface mount type, 4.5mm height
CE-PX	CE-PC	Surface mount type, 125°C Long life
MV-AZ	ME-CZ	105°C Standard
MV(ME)-FA	ME-CZ	105°C Standard
MV-EG,GX	ME-AX	105°C low impedance, high-reliability
MV-HW	ME-HC	85°C Standard
MV-HPS	ME-HPC	85°C Miniature, standard (mid.&high voltage)
MV-NPD, NPDW	ME-HWN	85°C Bi-polar (miniature, standard)

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## Product Line-up Table

Product Line-up Table

### Product Line-up Table of Aluminum Electrolytic Capacitors with Hybrid Semiconductor

Classification	Series	Features	Snal & Thin type	Low ESR	Long Life	Solvent Proof	Category Temperature Range(°C)	Rated Voltage Range(V.DC)	Rated Capacitance Range(μF)	External Appearance	Marking Color	Page
NEW H V P	125°C		●	●	●	-55 to +125	25 to 63	3.9 to 270	—	Blue	18	


### Product Line-up Table of Aluminum Electrolytic Capacitors with Hybrid Electrolyte

Classification	Series	Features	Snal & Thin type	Low ESR	Long Life	Solvent Proof	Category Temperature Range(°C)	Rated Voltage Range(V.DC)	Rated Capacitance Range(μF)	External Appearance	Marking Color	Page

### Product Line-up Table of Surface Mount Type

Classification	Series	Features	Snal & Thin type	Low Impedance	Long Life	Solvent Proof	Category Temperature Range(°C)	Rated Voltage Range(V.DC)	Rated Capacitance Range(μF)	External Appearance	Marking Color	Page
CE-BE	Super Low Profile 3.9mm Height	●			●	-40 to +85	4 to 50	1.0 to 180	—	Black	21	
CE-BD	Low Profile 4.5mm Height	●			●	-40 to +85	4 to 50	0.1 to 220	—	Black	22	
CE-BSS	Miniature, Standard	●			●	-40 to +85	6.3 to 50	4.7 to 220	—	Black	23	
CE-C	φ3mm Version	●			●	-40 to +85	4 to 50	0.1 to 22	—	Black	24	
CE-BS	Standard				●	-40 to +85	4 to 100	0.1 to 6800	—	Black	24	
CE-FE	3.9mm Height Temperature of Wide Range	●			●	-40 to +105	6.3 to 50	1.0 to 100	—	Black	25	
CE-FD	4.5mm Height Temperature of Wide Range	●			●	-40 to +105	6.3 to 50	0.1 to 100	—	Black	26	
NEW CE-LD	4.5mm Height Long Life			●	●	-40 to +105	6.3 to 50	0.1 to 100	—	Black	27	
CE-FS	105°C, Standard				●	-55 to +105	6.3 to 63	0.1 to 6800	—	Black	28	
					●	-40 to +105	100	1.0 to 150			28	
					●	-40 to +105	160 to 400	2.2 to 82			29	
CE-FH	Long Life			●	●	-40 to +105	6.3 to 50	0.1 to 4700	—	Black	30	
CE-GA	5.4mm Height Super Low Impedance		●		●	-55 to +105	6.3 to 63	0.47 to 100	—	Black	31	
CE-AX	Low Impedance, High-Reliability		●		●	-55 to +105	6.3 to 50	4.7 to 6800	—	Black	32	
CE-KX	Super Low Impedance		●		●	-55 to +105	6.3 to 100	4.7 to 6800	—	Black	33	
CE-LS	Low Impedance, Long Life		●	●	●	-40 to +105	6.3 to 50	1.0 to 330	—	Black	34	
NEW CE-LH	Long Life				●	●	-40 to +105	6.3 to 50	0.1 to 220	—	Black	35
					●	●	-40 to +105	160 to 400	2.2 to 82			36
CE-LX	Low Impedance, Long Life		●		●	-55 to +105	6.3 to 50	4.7 to 6800	—	Black	37	
UP GRADE CE-PC	125°C, Long Life				●	●	-40 to +125	6.3 to 100	1.0 to 4700	—	Black	38
CE-PX	125°C				●	●	-40 to +125	6.3 to 50	33 to 1500	—	Black	★
NEW CE-PH	125°C, Low ESR, Hi-Ripple		●	●	●	-40 to +125	16 to 35	160 to 1500	—	Black	39	
CE-NP	Bi-polar				●	-40 to +85	6.3 to 50	0.1 to 47	—	Black	40	
CE-FN	Bi-polar Temperature of Wide Range				●	-55 to +105	6.3 to 63	0.1 to 47	—	Black	41	

### Product Line-up Table of Radial Lead Type

Classification	Series	Features	Snal & Thin type	Low Impedance	Long Life	Solvent Proof	Category Temperature Range(°C)	Rated Voltage Range(V.DC)	Rated Capacitance Range(μF)	External Appearance	Marking Color	Page	
													Radial Lead Type 
ME-UWA	5mm Height Miniature, Standard	●			●	-40 to +85	6.3 to 50	0.1 to 100	Black	White	43		
ME-SWB	7mm Height	●			●	-40 to +85	4 to 63	0.1 to 470	Black	White	44		
ME-HC	Standard	●			●	-40 to +85	6.3 to 100	0.1 to 15000	Black	White	45		
ME-HPC	Miniature, Standard (Mid. & High Voltage)		●			●	-40 to +85	160 to 250	0.47 to 220	Black	White	46	
			●			●	-25 to +85	350 to 450	0.47 to 100			46	
ME-HPD	Miniature, Low Profile (Mid. & High Voltage)		●			●	-40 to +85	160 to 250	47 to 220	Black	White	46	
			●			●	-25 to +85	350 to 450	10 to 68			46	

## Product Line-up Table

### Product Line-up Table of Radial Lead Type

Classification	Series	Features	Small & Thin Type	Low Impedance	Long Life	Solvent Proof	Category Temperature Range(°C)	Rated Voltage Range(V.DC)	Rated Capacitance Range(μF)	External Appearance	Marking Color	Page
Radial Lead Type	ME-UZ	5mm Height, Temperature of Wide Range	●			●	-55 to +105	6.3 to 50	0.1 to 220	Green	White	47
	ME-SZ	7mm Height, Temperature of Wide Range	●			●	-55 to +105	6.3 to 50	0.1 to 330	Green	White	47
	ME-CZ	Miniature, Standard Temperature of Wide Range	●			●	-55 to +105	6.3 to 100	0.1 to 15000	Green	White	48
	ME-UAX	5mm Height, Low Impedance	●	●		●	-55 to +105	6.3 to 35	4.7 to 220	Green	Gold	50
	ME-SAX	7mm Height, Low Impedance	●	●		●	-55 to +105	6.3 to 35	4.7 to 330	Green	Gold	50
	NEW ME-LS	Long Life, High-Reliability		●	●	●	-40 to +105	6.3 to 50	1.0 to 1000	Black	Silver	51
	ME-CA	Miniature, Standard Low Impedance	●	●		●	-55 to +105	6.3 to 50	0.47 to 15000	Green	Silver	52
	ME-CX	Miniature, Low Impedance	●	●		●	-55 to +105	6.3 to 35	47 to 15000	Green	Gold	54
	ME-AX	Low Impedance, High-Reliability		●	●	●	-55 to +105 -40 to +105	6.3 to 63 100	0.47 to 12000 5.6 to 470	Green	Gold	56
	ME-WX	Low Impedance•High Ripple		●			-40 to +105	6.3 to 50	22 to 6800	Green	Gold	58
	NEW ME-WA	Low Impedance •High Ripple Long Life		●	●		-40 to +105	6.3 to 35	220 to 8200	Black	Gold	60
	MB-UWG	5mm Height, Low ESR	●	●			-40 to +105	6.3 to 25	39 to 150	—	Black	62
	ME-SWG	7mm Height, Low ESR	●	●			-40 to +105	6.3 to 35	22 to 330	Black	Gold	63
	ME-WG	Super Low ESR		●			-40 to +105	6.3 to 25	220 to 3300	Green	Gold	64
	ME-FZ	Extra Long Life, High Performance		●	●	●	-55 to +105	10 to 50	10 to 4700	Black	Silver	★
	ME-PX	125°C, High Performance		●	●	●	-55 to +125	10 to 100	1.0 to 4700	Clear Green	Black	65
					●		-40 to +125	160 to 250	10 to 150			66
					●		-25 to +125	350 to 400	4.7 to 47			66
	ME-FC	Miniature, Guaranteed 105°C (Mid. & High Voltage)	●				-40 to +105 -25 to +105	160 to 400 450	0.47 to 220 1.0 to 47	Black	White	67
	ME-FD	105°C, Miniature, Low Profile (Mid. & High Voltage)	●				-40 to +105 -25 to +105	160 to 400 450	22 to 220 10 to 33	Black	White	67
ME-FAZ	High Ripple (Mid. Voltage)		●			-40 to +105	160 to 250	1.0 to 220	Black	White	68	
UP GRADE ME-FH	105°C, Long Life (Mid. & High Voltage)			●		-40 to +105 -25 to +105	160 to 400 450	10 to 220 6.8 to 47	Black	White	69	
ME-HLB	Low Leakage Current					-40 to +85	16 to 50	0.1 to 100	Blue	Black	★	
ME-HT	Timer Circuit Use					-40 to +85	10 to 50	1.0 to 2200	Green	Black	★	
ME-UWN	5mm Height, Bi-polar	●			●	-40 to +85	6.3 to 50	0.1 to 47	Black	White	70	
ME-SWN	7mm Height, Bi-polar	●			●	-40 to +85	6.3 to 50	0.1 to 47	Black	White	71	
ME-HWN	Miniature, Standard, Bi-polar	●			●	-40 to +85	6.3 to 100	0.47 to 2200	Black	White	72	

### Product Line-up Table of Snap-in Type

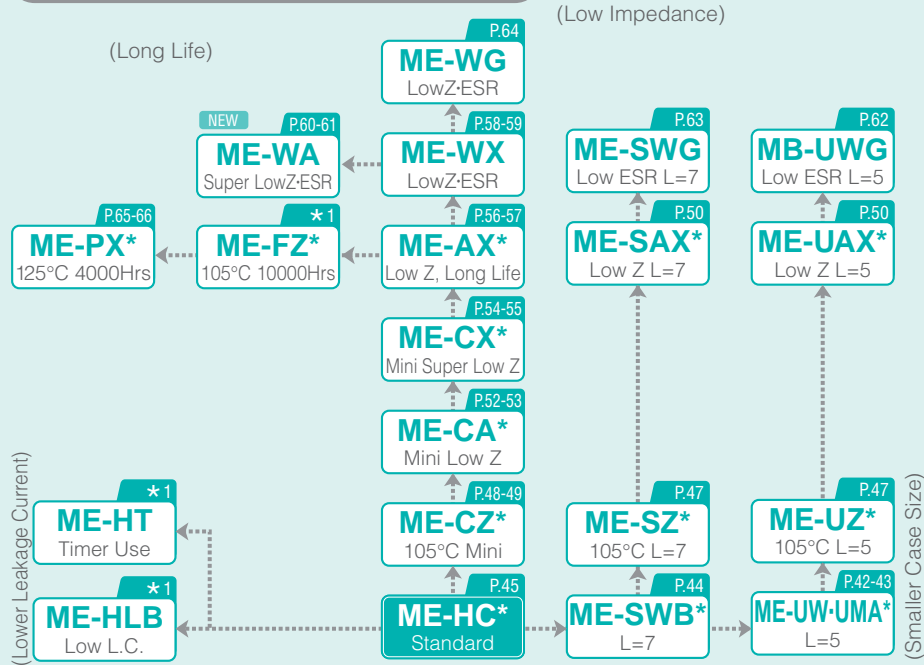
Classification	Series	Features	Small & Thin Type	Low Impedance	Long Life	Solvent Proof	Category Temperature Range(°C)	Rated Voltage Range(V.DC)	Rated Capacitance Range(μF)	External Appearance	Marking Color	Page
Snap-in Type	PE-HC	Standard					-40 to +85 -25 to +85	10 to 250 315 to 450	56 to 82000	Black	White	★
	PE-HD	Miniaturized	●				-40 to +85 -25 to +85	160 to 250 400 to 450	68 to 3300	Black	White	★
	PE-EC	105°C Standard					-40 to +105 -25 to +105	10 to 100 160 to 450	47 to 82000	Black	White	★
	PE-ED	105°C Smaller in Size	●				-25 to +105	160 to 450	56 to 2700	Black	White	★
	PE-EF	Guaranteed for 5000 hours at 105°C			●		-25 to +105	200 to 450	82 to 2200	Black	White	★
	PE-EG	Guaranteed for 7000 hours at 105°C			●		-25 to +105	160 to 450	39 to 2200	Black	White	★
	PE-ES	105°C Low Profile	●				-40 to +105 -25 to +105	10 to 100 160 to 450	27 to 10000	Black	White	★

Please refer to <http://www.edc.sanyo.com> for the information in columns where ★ marking is indicated in a page row.

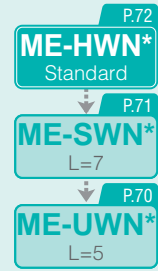
## Series System Diagram

### System Diagram

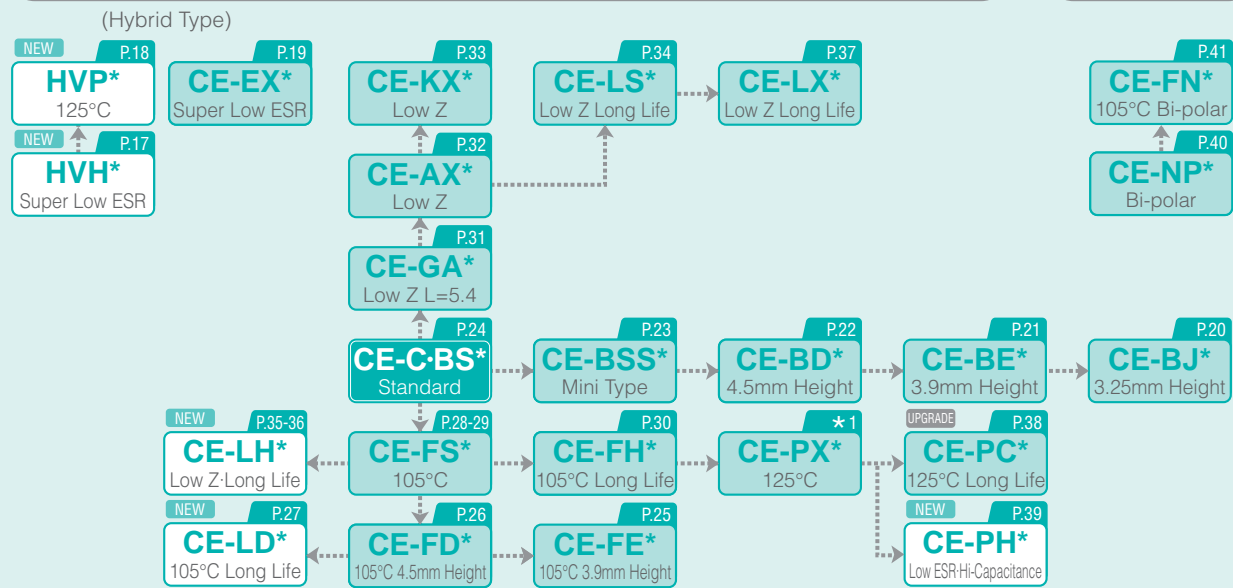
#### RADIAL LEAD TYPE (LOW VOLTAGE)



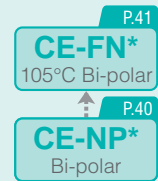
#### BI-POLAR



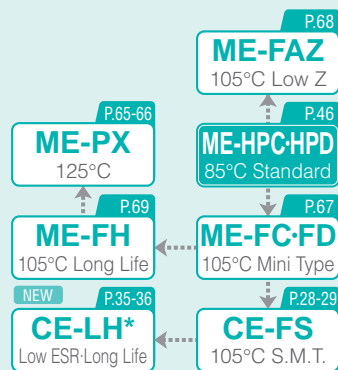
#### SURFACE MOUNT TYPE (LOW VOLTAGE)



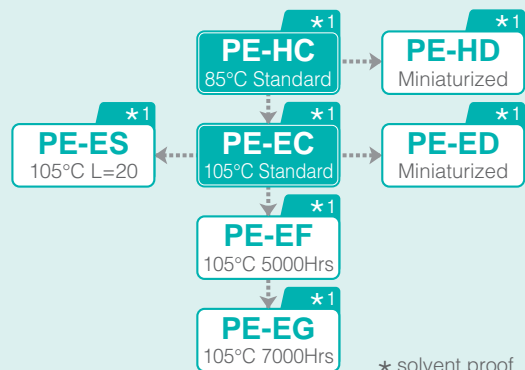
#### BI-POLAR



#### MINI OF MID. & HIGH VOLTAGE



#### LARGE SIZED (Snap-in Type)



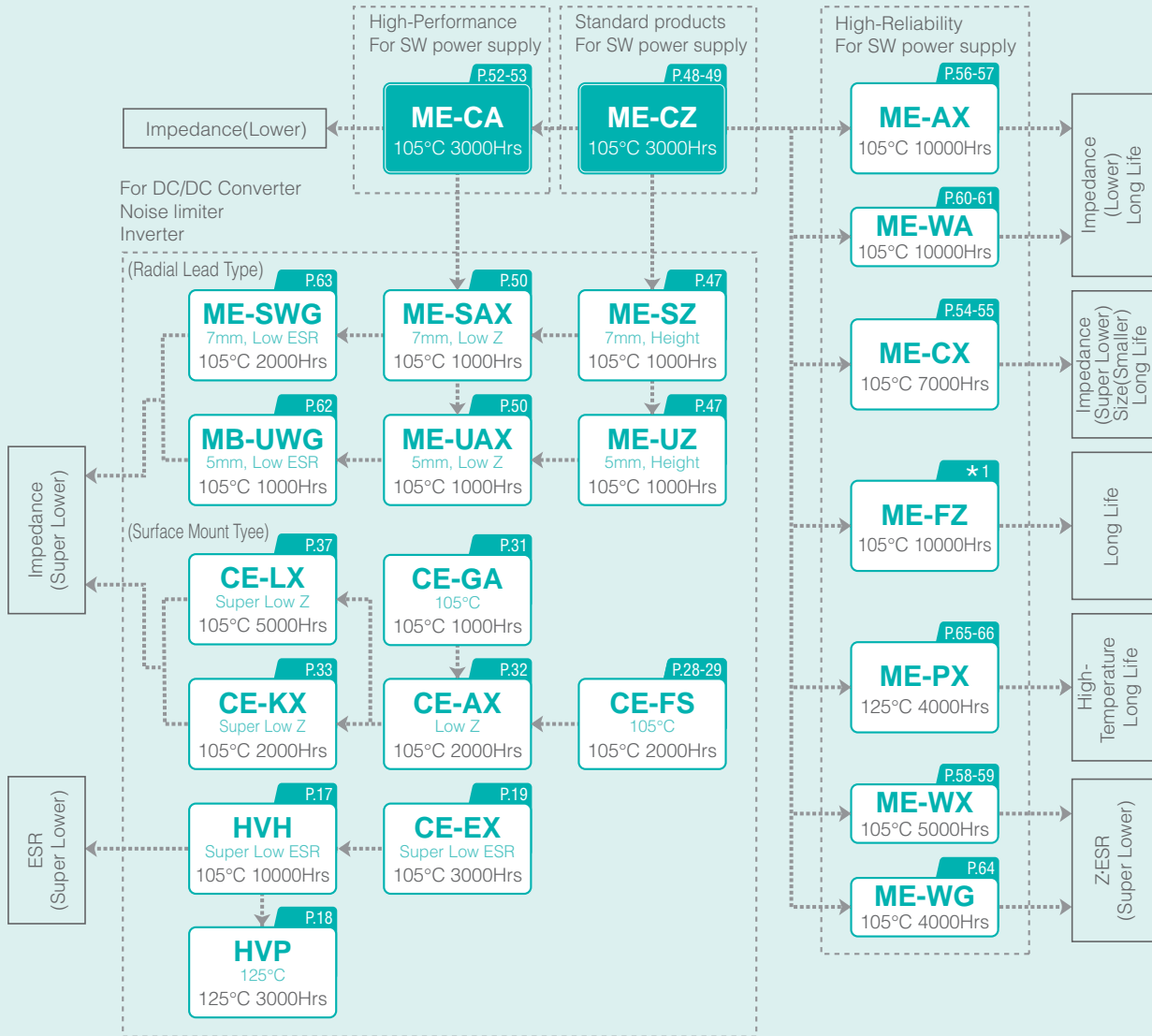
\* solvent proof

Please refer to <http://www.edc.sanyo.com> for the information in columns where \* 1 marking is indicated in a page row.

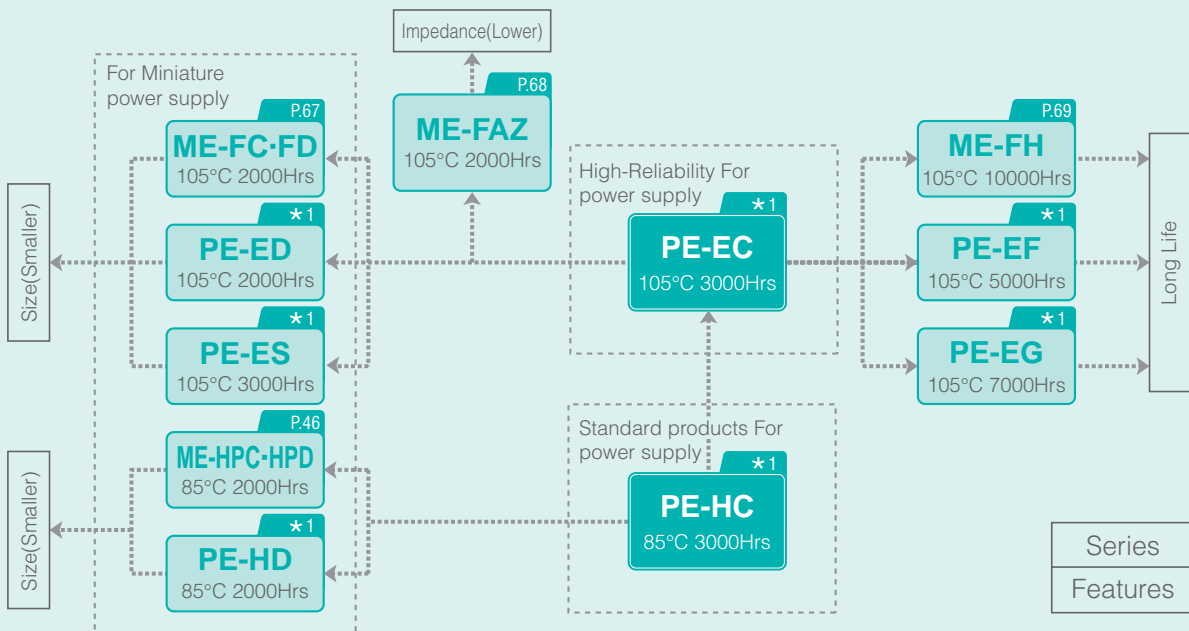
## Series System Diagram

### System Diagram for Power Supply

#### FOR SECONDARY SMOOTHING CIRCUIT



#### FOR PRIMARY SMOOTHING CIRCUIT



Series System Diagram

Series  
Features

Please observe the following guidelines when using aluminum electrolytic capacitors. (Hereafter "Capacitors")

## ■ Circuit Diagram

- 1) Please use according to the values noted in the catalogue or the specification sheet when considering the application and use of the capacitors.
- 2) Please use according to the temperature range and rated ripple current as noted in the catalogue or the specification sheet.
  - a) Life time of electrolytic capacitors depends on the ambient temperature.  
Generally the life time would be doubled as the temperature decreased by 10 degrees.  
It is recommended that capacitors be used at a lower temperature than that of the maximum warranty as possible.
  - b) Capacitors should be used at current values within the rated ripple current.  
If capacitor bears excessive ripple current, heat generation acutely increases, therefore decreasing capacitance or even damage the capacitor. Please refer to the rated ripple current of each series.
- 3) Please choose the capacitor that matches the lifetime of the intended circuit design.
- 4) Regular capacitors have polarity. If electrical current is applied in the opposite direction to a capacitor's polarity, the result could be a short circuit or destruction of the capacitor.  
Bi-polar capacitors should be used in circuit where polarity is occasionally reversed, or where polarity is unknown. (except AC)
- 5) In circuits where frequent charge and discharge are common, capacitance decrease as the internal overheat causes damage to capacitors. In such circuits, please use charge and discharge proof capacitors.
- 6) Do not apply DC-voltage exceeding rated voltage of the capacitors.
- 7) The exterior sleeve of a capacitor is not guaranteed as an insulator.  
Do not use the capacitor where insulation is required.  
The aluminum case of a capacitor is not insulated from a cathode lead wire.
- 8) Do not use in the following environments.
  - a) In the environments of splashed water, salt water, and oil on the capacitors.
  - b) In the presence of poisonous gas. (Hydrogen sulfide, Sulfurous acid, Chlorine, Ammonia, etc)
  - c) In the environments of applied ozone, ultraviolet rays and radial rays.
  - d) Where vibration or shock exceeds the allowable values as noted in the catalogue or specification sheet.
- 9) Please design after confirming the following points concerning the application and use.
  - a) Please match the leads space with the holes space of the circuit board.
  - b) It is recommended at least 3mm of space around the pressure relief vent.
  - c) Avoid placing to printed wire above the pressure relief vent.
  - d) Make a hole on a circuit board if the top of an aluminum case is positioned below the circuit board at short distance. The hole is to make the passage of gas from a safety vent when the vent opens.
- 10) Avoid having the printed wire under the capacitor.



## Guidelines and Precautions for Use

- 11) Avoid placing other parts near or on the opposite side of the circuit board from the capacitor which gives off heat.
- 12) As for the land pattern of surface mount type capacitors, please refer to the values noted in the catalogue or specification sheet.
- 13) Please design after confirming these other following points.
  - a) The performance of the capacitor will vary as the temperature or frequency varies.
  - b) If capacitor is mounted to the double sided circuit board, avoid placing through holes under capacitors.
  - c) Please consider the balance of the current when using two or more capacitors in parallel.
  - d) Please consider the balance of the voltage when using two or more capacitors in series.

## ■ Mounting

- 1) Do not use a capacitor that has been inserted and connected to a current.  
Except for capacitors that have been removed to check the electrical properties during periodical checks, do not reuse.
- 2) In case the capacitor has re-striking-voltage, please discharge through 1k $\Omega$  resistor.
- 3) In case the leakage current increases with long term storage, please apply the rated voltage to the capacitor for 30 minutes through 1k $\Omega$  of protective series resistors.
- 4) Please mount capacitor after confirmation of following rates : rated capacitance, rated voltage.
- 5) Please mount after confirming the polarity of capacitor.
- 6) Do not drop or use dropped pieces.
- 7) Be careful not to deform the capacitor during installation.
- 8) When mounting capacitors to the circuit board, please use capacitors that the lead space equal the hole space of the circuit board.
- 9) When mounting snap-in type capacitors, please mount close adherence to the circuit board.
- 10) When mounting capacitors with automatic inserting machines, do not apply excessive force to the lead wire or terminals.
- 11) When mounting capacitors with automatic inserting machines, do not apply excessive force to the body of capacitors.
- 12) Please confirm the following points when you solder with a soldering iron.
  - a) Follow the criteria of soldering condition including time and temperature noted in a catalogue or a specification.
  - b) Process the shape of lead wires before soldering when the lead wire space of a capacitor does not match the through hole space of a circuit board, Avoid the stress to the body of the capacitor.
  - c) Melt solder enough to rework a capacitor with a soldering iron after removing it from a circuit board.  
Insufficiency of melting solder causes physical stress to lead wires.
  - d) Do not touch the body of a capacitor with the tip of a soldering iron.

## Guidelines and Precautions for Use

- 13) Please confirm the following points when you perform flow soldering.
- Do not soak a capacitor in melt solder. Perform flow soldering only on the opposite side of a circuit board where no capacitor is placed.
  - Follow the instruction in a catalogue or a specification with regard to the soldering condition; preheat, soldering temperature, and soaking time.
  - Avoid the attachment of flux to the body of a capacitor except lead wires.
  - Do not locate a capacitor where metal lead wires of the other components contact with the capacitor.
- 14) Please confirm the following points when you perform reflow soldering.
- Follow the specifications for pre-heat, reflow time and peak temperature as noted in the catalogue or specification sheet.
  - The absorption coefficient of infrared rays depends on the color and material of a capacitor.  
Avoid heating too much to a capacitor by an infrared heater.
- 15) After mounting the circuit board, do not apply the following mechanical stress.
- Do not apply excessive force to the lead wires or terminals.
  - Do not tilt or bring down the capacitor.
  - Do not pick up circuit board by holding the mounted capacitor.
  - Do not jolt the capacitor. When stacking circuit boards, make sure the capacitor does not come into contact with any other parts.
- 16) In principle, aluminum electrolytic capacitors are not designed to withstand to the cleaning solvent. If cleaning of a board is necessary, select capacitor designed to withstand cleaning process, and observe the cleaning conditions specified in the catalogue or in the manufacturer's specification. Do not clean the capacitors using solvent, unless so specified in catalogue or manufacturer's specification. Use of one of the following chemicals for cleaning may damage the capacitor.
- Solvent containing halogen ions : Damage due to electrolysis of elements
  - Alkaline solvent : Corrosion of the aluminum case
  - Xylene : Degradation of sealing rubber
  - Acetone : Disappearance of markings.
  - Terpene, petro-based solvents : Degradation of sealing rubber
- 17) When cleaning solvent proof capacitors, please confirm the following points.
- Please manage the pollution of the cleaning solvent. (conductivity, pH, specific gravity, content of water, etc)
  - Do not keep in the environments of cleaning solvents or airtight containers, after cleaning the capacitors.  
Please dry the circuit board and capacitors in a hot blast stove within upper category temperature or less.
- 18) When using polymer adhesives, select adhesives without halogenated solvents, nor chloroprene.
- 19) Please confirm the following when using coating agents and polymer adhesives.
- When adhesion or coating is performed after cleaning, air dry should be made immediately remove cleaning solvent between capacitors and circuit board.
  - Avoid the treatment that cover the seal of the capacitor, such as coating agents and use of polymer adhesive.

## ■ During operation or use

- Do not directly touch the capacitor.
- Do not short two lead wires with any conductive material.  
Do not spray acid or alkali conductive solution to a capacitor.

## Guidelines and Precautions for Use

3) Confirm the following concerning the operating environments.

- a) In the environments of splashed water, salt water, and oil on the capacitors.
- b) Where a capacitor is exposed to direct sunshine.
- c) In the environments of applied ozone, ultraviolet rays and radial rays.
- d) Where vibration or shock exceeds the allowable values as noted in the catalogue or specification sheet.

## ■ Maintenance · Inspection

1) For industrial use, please periodically check the capacitor.

2) When checking, inspect the following points.

- a) Outside appearance.
- b) Electrical performance. (Leakage current, Capacitance, Tangent of loss angle, etc)

## ■ In case a problem occurs

1) While using the application, if you see gas, turn off the main power supply to the set or remove the plug from the outlet.

2) When working with a pressure relief vent, high temperature gas spouts out, therefore, do not bring the face close to the capacitor.

3) In case spouted gas got into the eye, immediately wash with the water.

In case you breath spouted gas, immediately rinse out your mouth.

## ■ Storage conditions

1) Do not store at high temperatures or in high humidity. Please store indoors between 5°C and 35°C at 75% relative humidity or below. Product is safekeeping for less than 1 year after shipment.

2) Do not store where it can come into contact with water, oil, or salt water.

3) Do not store in an environment with poisonous gas. (Hydrogen sulfide, Sulfurous acid, Chlorine, Ammonia, etc)

4) Do not store in an environment that applies ozone, ultraviolet rays, radial rays.

## ■ Scrap of capacitors

1) Please follow these guidelines when scrapping the capacitors.

- a) Burn after putting a hole in the capacitor or crush the capacitor.
- b) If you do not burn it, please arrange for a professional waste management firm to bury or use other method to scrap.

This guide to use aluminum electrolytic capacitors conform to technical report EIAJ RCR-2367B "Guideline of notabilia for fixed aluminum electrolytic capacitors for use in electronic equipment".  
Please refer to this technical report for additional details.

### RoHS Compliance

The environmental products do not use any of the following substances regulated by RoHS directive, in the materials (homogeneous materials).

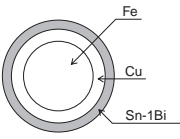
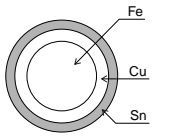
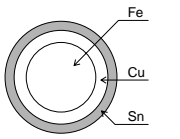
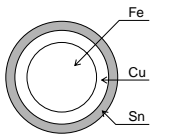
Restricted substances by RoHS directive

- Lead (Pb) and it's compounds
- Cadmium (Cd) and it's compounds
- Mercury (Hg) and it's compounds
- Hexavalent chromium (Cr VI) compounds
- Polybrominated biphenyls (PBBs)
- Polybrominated diphenyl ethers (PBDEs)

### We promote the activities which are considered for ecology.

The environmental products are available with Pb-free products which don't include Pb in terminals of main body and PVC-free products which don't include exterior materials. Please contact us about the specification etc.

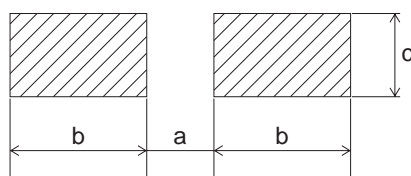
Environmental Products (Compliance of RoHS Directive)

Type code	Surface Mount Type Aluminum Electrolytic Capacitors		Radial Lead Type Aluminum Electrolytic Capacitors	
	CE	CE_T	ME	MB
Kind of coat	Sn-1Bi ( $\phi$ 3 to $\phi$ 12.5) 	Sn ( $\phi$ 16) 	Sn 	Sn 
Model No. (example)	10CE100BS (100 $\mu$ F/10V)	10CE4700BST (4700 $\mu$ F/10V)	10ME100AX (100 $\mu$ F/10V)	10MB100UWG (100 $\mu$ F/10V)
Sleeve	No used	No used	PET	No used
Moisture Sensitivity Level (MSL)*	Not applicable No need dry package	Not applicable No need dry package	Not applicable No need dry package	Not applicable No need dry package

(★Conform to IPC/JEDEC J-STD-020C)

### Surface Mount Type Recommended Land Pattern

land pattern



(Unit:mm)

Size	a	b	c
$\phi$ 3	0.8	2.2	1.7
$\phi$ 4	1.0	2.6	1.8
$\phi$ 5	1.4	3.0	1.8
$\phi$ 6.3	2.1	3.5	1.8
$\phi$ 8	2.8	4.1	2.1
$\phi$ 10	4.3	4.4	2.5
$\phi$ 12.5	4.3	5.8	2.5
$\phi$ 16	6.6	6.5	5.0

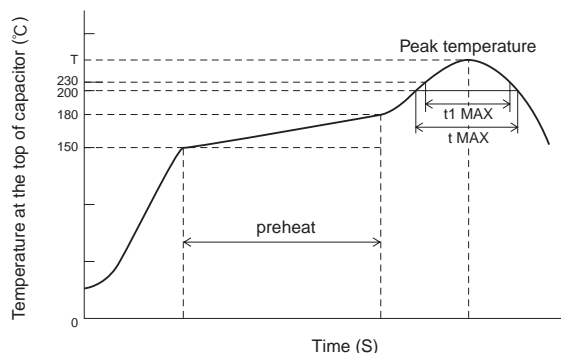
When using large surface mount capacitor, please design possibly larger land pattern area than the recommended pattern dimension in order to increase vibration resistance and avoid to falling off a circuit board.

### Soldering Condition

- Soldering with a soldering iron - within 350°C × 3 seconds unless otherwise specified in the spec.
- Flow soldering - within 260°C × 10 seconds unless otherwise specified in the spec.
- Thermal curing over - ambient temperature within 150°C × 2 minutes.

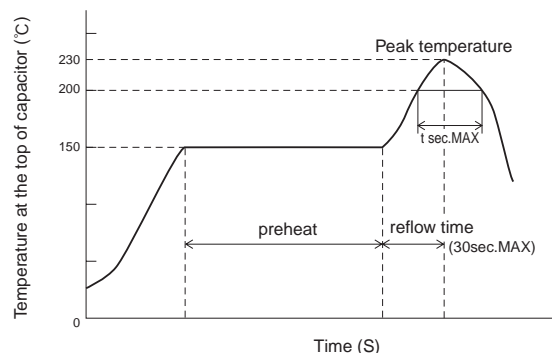
### Surface Mount Type Permissible Reflow Condition

[Profile 1]  
AIR reflow and IR reflow



Preheat ; 150°C to 180°C, Within 120sec.

[Profile 2]  
AIR reflow and IR reflow



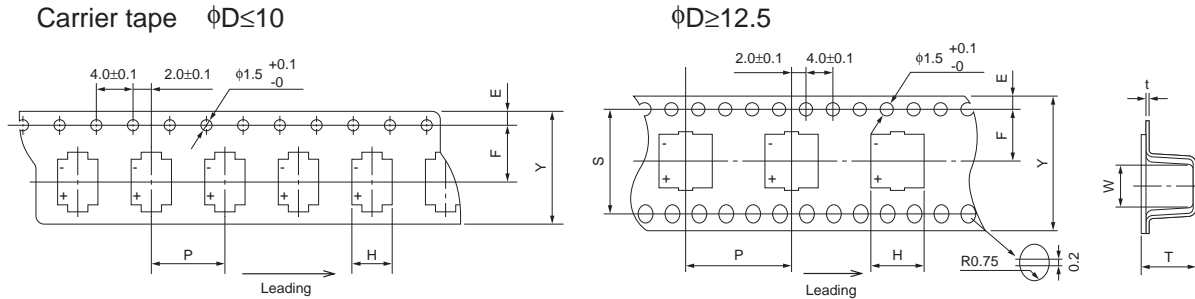
Preheat ; 150°C, Within 120sec.

Series	Voltage	Size	Time for more than 200°C (t)	Time for more than 230°C (t1)	Peak temperature (Within 5sec.)	Profile
HVH, HVP	ALL	φ6.3 to φ10	Within 70sec.	Within 40sec.	260°C	1
CE-EX, CE-BSS, CE-C CE-BS, CE-FS, CE-FH CE-GA, CE-AX, CE-KX CE-LH, CE-PX, CE-NP CE-FN	4 to 63V	φ3 to φ6.3	Within 70sec.	Within 40sec.	250°C	
		φ8	Within 60sec.	Within 30sec.	245°C	
		φ10, φ12.5	Within 50sec.	Within 20sec.	240°C	
		φ16	Within 50sec.	Within 15sec.	235°C	
	80 to 100V	φ4 to φ6.3	Within 60sec.	Within 40sec.	250°C	
		φ8	Within 60sec.	Within 30sec.	240°C	
		φ10	Within 50sec.	Within 20sec.	240°C	
		φ12.5	Within 50sec.	Within 20sec.	235°C	
	160 to 400V	φ16	Within 45sec.	Within 10sec.	235°C	
		φ8, φ10	Within 50sec.	Within 20sec.	240°C	
φ12.5		Within 45sec.	Within 10sec.	235°C		
CE-LX, CE-LS, CE-PC	ALL	φ4 to φ8	Within 80sec.	Within 40sec.	260°C	
		φ10	Within 70sec.	Within 40sec.	250°C	
		φ12.5	Within 50sec.	Within 20sec.	240°C	
		φ16	Within 50sec.	Within 15sec.	235°C	
CE-PH	ALL	φ8, φ10	Within 70sec.	Within 40sec.	250°C	1
		φ12.5	Within 50sec.	Within 20sec.	240°C	
CE-BD, CE-FD, CE-LD	ALL	ALL	Within 60sec.	Within 30sec.	245°C	
CE-BE, CE-FE	ALL	ALL	Within 50sec.	Within 20sec.	240°C	
CE-BJ	ALL	ALL	Within 30sec.	—	230°C	

Capacitors can withstand two reflow processes on the above conditions. Second reflow shall be taken after more than one hour natural cooling time and taken after the return to normal temperatures of PCB board and components.

## Taping Specifications

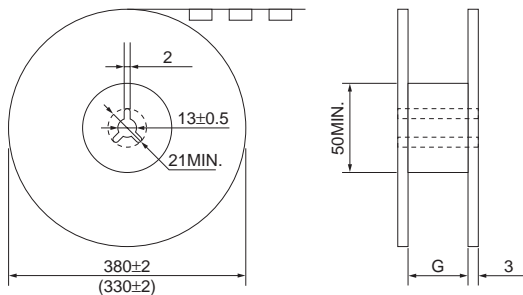
### Surface Mount Type Taping Specifications



(Unit:mm)

Size( $\phi D \times L$ )	$Y \pm 0.3$	$H \pm 0.2$	$W \pm 0.2$	$P \pm 0.1$	$E \pm 0.1$	$F \pm 0.1$	$T \pm 0.2$	$t$	$S \pm 0.1$
$\phi 6.3 \times 3.25$	16.0	7.0	7.0	12.0	1.75	7.5	3.7	0.4	—
$\phi 5 \times 3.9$	12.0	5.7	5.7	12.0	1.75	5.5	4.5	0.4	—
$\phi 6.3 \times 3.9$	16.0	7.0	7.0	12.0	1.75	7.5	4.5	0.4	—
$\phi 4 \times 4.5$	12.0	4.7	4.7	8.0	1.75	5.5	5.0	0.4	—
$\phi 5 \times 4.5$	12.0	5.7	5.7	12.0	1.75	5.5	5.0	0.4	—
$\phi 6.3 \times 4.5$	16.0	7.0	7.0	12.0	1.75	7.5	5.1	0.4	—
$\phi 3 \times 5.4$	12.0	3.7	3.7	8.0	1.75	5.5	5.8	0.4	—
$\phi 4 \times 5.4$	12.0	4.7	4.7	8.0	1.75	5.5	5.8	0.4	—
$\phi 5 \times 5.4$	12.0	5.7	5.7	12.0	1.75	5.5	5.8	0.4	—
$\phi 6.3 \times 5.4$	16.0	7.0	7.0	12.0	1.75	7.5	5.8	0.4	—
$\phi 4 \times 6.0$	12.0	4.7	4.7	8.0	1.75	5.5	6.4	0.4	—
$\phi 5 \times 6.0$	12.0	5.7	5.7	12.0	1.75	5.5	6.4	0.4	—
$\phi 6.3 \times 6.0$	16.0	7.0	7.0	12.0	1.75	7.5	6.5	0.4	—
$\phi 6.3 \times 7.7$	16.0	7.0	7.0	12.0	1.75	7.5	8.2	0.4	—
$\phi 8 \times 10.2(10.5)$	24.0	8.7	8.7	16.0	1.75	11.5	11.1	0.4	—
$\phi 10 \times 7.7$	24.0	10.7	10.7	16.0	1.75	11.5	8.3	0.4	—
$\phi 10 \times 10.2(10.5)$	24.0	10.7	10.7	16.0	1.75	11.5	11.2	0.4	—
$\phi 12.5 \times 13.5$	32.0	13.2	13.2	24.0	1.75	14.2	14.3	0.5	28.4
$\phi 16 \times 16.5$	44.0	17.5	17.5	28.0	1.75	20.2	17.3	0.5	40.4

Reel



	G
$\phi 3, \phi 4, \phi 5$	14
$\phi 6.3$	18
$\phi 8, \phi 10$	26
$\phi 12.5$	34
$\phi 16$	46

$\phi D \times L$ (mm)	Quantity of 1 Reel( $\phi 380$ )	Quantity of 1 Reel( $\phi 330$ )	Quantity of 1 package(Reel)
$\phi 5 \times 3.9$	—	1000	5
$\phi 6.3 \times 3.25, 3.9$	—	1000	5
$\phi 4 \times 4.5$	2000	1500 *	5
$\phi 5 \times 4.5$	—	1000	5
$\phi 6.3 \times 4.5$	—	1000	5
$\phi 3 \times 5.4$	2000	1500 *	5
$\phi 4 \times 5.4$	2000	1500 *	5
$\phi 5 \times 5.4$	—	1000	5
$\phi 6.3 \times 5.4$	—	1000	5
$\phi 4 \times 6.0$	2000	1200 *	5
$\phi 5 \times 6.0$	1000	800 *	5
$\phi 6.3 \times 6.0$	1000	800 *	5
$\phi 6.3 \times 7.7$	900	500 *	5
$\phi 8 \times 10.2(10.5)$	500	300 *	3
$\phi 10 \times 7.7$	500	400 *	3
$\phi 10 \times 10.2(10.5)$	500	300 *	3
$\phi 12.5 \times 13.5$	—	200	2
$\phi 16 \times 16.5$	—	125	2

\*Reel code has to be specified after the model number.

Model No. 25CE47BS+E

Reel code

When you place an order, please make sure that order should be integral multiple of the minimum packing unit.

## Taping Specifications

### Radial Lead Type Taping Specifications for Automatic Inserting Machines

Fig.1

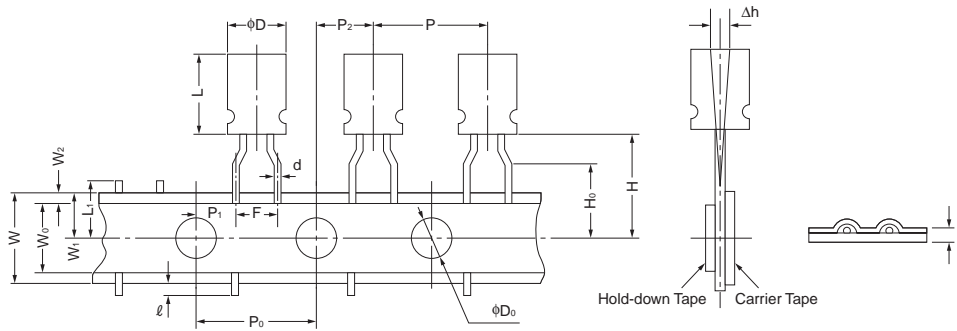


Fig.2

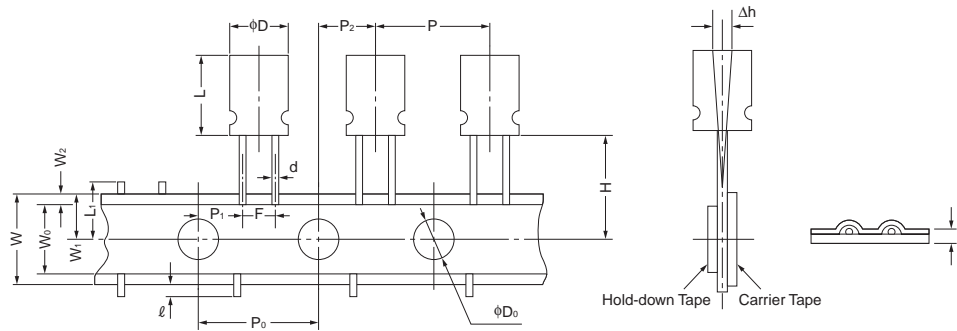
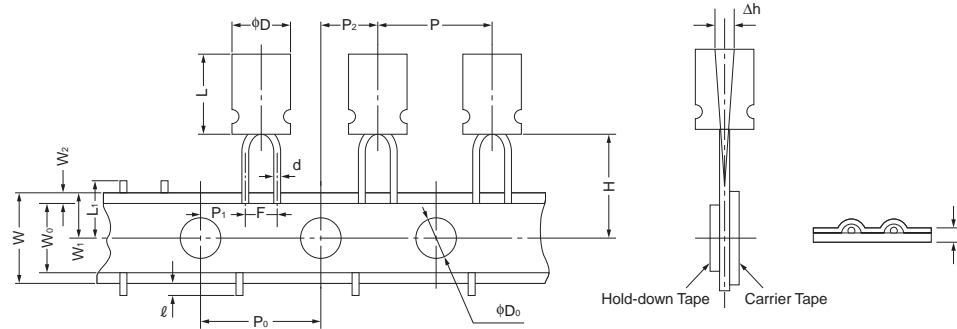


Fig.3



(Unit:mm)

Product Outer Dimensions		φ3toφ6.3×5 φ4toφ6.3×7.5	φ5×11 φ6.3×11	φ8	φ10	φ12.5	φ16 ×25	φ3 ×5	φ4toφ5×5 φ4toφ5×7	φ6.3×5 φ6.3×7.5	φ5 ×11	φ6.3 ×11	φ8
Fig. No.		1	1	1	2	2	(★3)	1	3	2	3	2	2
Lead wire interval	F	<sup>+0.8</sup> <sub>-0.2</sub> (★1)	5.0	5.0	5.0	5.0	7.5	2.5	2.5	2.5	2.5	2.5	3.5
Pitch between components	P	±1.0	12.7	12.7	12.7	12.7	15.0	30.0	12.7	12.7	12.7	12.7	12.7
Sprocket hole pitch	P <sub>0</sub>	±0.2	12.7	12.7	12.7	12.7	15.0	15.0	12.7	12.7	12.7	12.7	12.7
Sprocket hole position	P <sub>1</sub>	±0.5	3.85	3.85	3.85	3.85	5.0	3.75	5.1	5.1	5.1	5.1	4.6
	P <sub>2</sub>	±1.0	6.35	6.35	6.35	6.35	7.5	7.5	6.35	6.35	6.35	6.35	6.35
Lateral deviation	Δh	±1.0	0	0	0	0	0	0	0	0	0	0	0
Carrier tape width	W	±0.5	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Hold-down tape width	W <sub>0</sub>	MIN.	6.0	6.0	6.0	6.0	11.5	11.5	6.0	6.0	6.0	6.0	6.0
Sprocket hole position	W <sub>1</sub>	±0.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Hold-down tape position	W <sub>2</sub>	MAX.	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Component-base height	H	±0.75(★2)	17.5(★4)	18.5	20.0	16.0 18.5	16.0 18.5	18.5	17.5	17.5 18.5	17.5 18.5	18.5	18.5
Lead wire clinch height	H <sub>0</sub>	±0.5	16.0	16.0	16.0	—	—	—	16.0	—	—	—	—
Sprocket hole diameter	φD <sub>0</sub>	±0.2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Tape thickness(total depth)	t	±0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Lead wire protrusion	ℓ	MAX.	0	0	0	0	0	0	0	0	0	0	0
Cut position of interior Components	L <sub>1</sub>	MAX.	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0

Taping code(standard)	Zig-Zag type	+T	+T	+T	+T +T0	+T +T0	+T	+TS	+TS	+TS0	+TS +TS0	+TS	+TS	+TS
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Taping code has to be specified after the model number.

Model No. 16ME100HC+T  
└ Taping code

(★1) Fig.2, Fig.3:±0.5

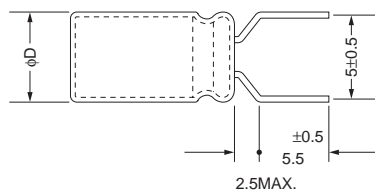
(★2) φ10・φ12.5 products (H=18.5): <sup>+1.5</sup><sub>-0.5</sub>

(★3) φ16 products:Skip one product at Fig.2

(★4) φ3×5 products (H=18.5): <sup>+0.75</sup><sub>-0.5</sub>

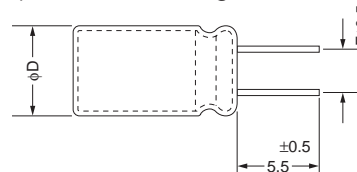
### Radial Lead Type Process Standard Specifications

#### 1)Lead wire forming \*



\*φD is limited to 5,6.3 or 8mm

#### 2)Lead wire cutting



(Unit:mm)

φD	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5

When ordering, please add the following notations to the end of the model number:

+FA . . . . . for lead wire forming

+CA . . . . . for lead wire cutting

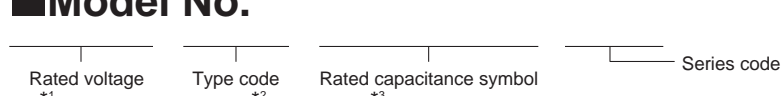
Examples of model numbers:

16ME100HC+FA

160ME22HPC+CA

When ordering a capacitor with a lead wire whose length is not listed above, please keep in mind that the notation at the end of the model number changes. Inquire with your supplier.

### Model No.



\*1.Rated voltage expresses a product mark with 6 about 6.3v.

\*2.Type code

CE: Surface mount type (Environmental products)

ME: Radial lead type (Environmental products)

MB: Radial lead type (Environmental products,sleeve less)

•HV series: Please refer to page 17,18.

*3	Rated capacitance(μF)	Symbol
	0.10	R1
	0.22	R22
	1.0	1
	4.7	4R7
	10	10
	100	100
	1000	1000
	10000	10000

### Surge Voltage

Rated voltage (v)	4	6.3	10	16	25	35	50	63	80	100
Surge voltage (v)	5	8	13	20	32	44	63	79	100	125
Rated voltage (v)	160	180	200	250	315	350	400	420	450	
Surge voltage (v)	200	225	250	300	365	400	450	470	500	

CE-EX series ; Please refer to page 19

### Minimum Packaging Quantity

#### ●Long lead

Size	Quantity	Remarks reference
φ3 to φ8*1	500 PCS.	*1.φ8×12.5L to 20L ; 200 PCS. (WA, WG series Sizeφ8×11.5L;200 PCS) *2.φ12.5×30L ; 100 PCS. *3.φ16×35L ; 50 PCS. Surface Mount Type ; Please refer to page12
φ10 to φ12.5*2	200 PCS.	
φ16*3	100 PCS.	
φ18	50 PCS.	

#### ●Taping

Size	Quantity
φ3 to φ4	4000 PCS.
φ5	3000 PCS.
φ6.3	2500 PCS.
φ8	1400 PCS.
φ10	900 PCS.
φ12.5	600 PCS.
φ16	250 PCS.

When you place an order, please make sure that order should be integral multiple of the minimum packing unit.



### Frequency Coefficient for Ripple Current

Series	Capacitance:C(μF)	Frequency:F(Hz)			
		100≤F<1k	1k≤F<10k	10k≤F<100k	100k≤F<500k
CE-EX	C≤33	0.05	0.32	0.65	1.00
	33<C	0.10	0.35	0.65	1.00
HVH HVP	C≤4.7	0.03	0.30	0.65	1.00
	4.7<C≤33	0.05	0.32	0.67	1.00
	33<C	0.10	0.35	0.70	1.00

Series	Capacitance:C(μF)	Frequency:F(Hz)			
		100≤F<1k	1k≤F<10k	10k≤F<100k	100k≤F
CE-BJ, CE-BE, CE-BD CE-BSS, CE-C, CE-BS CE-FE, CE-FD, CE-LD CE-FS(6.3 to 100V), CE-FH CE-LH(6.3 to 50V), CE-NP, CE-FN	C≤4.7	1.00	1.30	1.50	1.80
	4.7<C≤33	1.00	1.20	1.30	1.45
	33<C	1.00	1.10	1.20	1.30
CE-GA, CE-AX	C≤4.7	0.45	0.60	0.90	1.00
CE-KX, CE-LS	4.7<C≤33	0.60	0.75	0.95	1.00
CE-LX, CE-PC	33<C	0.75	0.85	0.95	1.00
CE-PX	ALL ITEM	1.00	1.10	1.20	1.30
CE-PH	ALL ITEM	0.60	0.85	0.93	1.00

Series	Capacitance:C(μF)	Frequency:F(Hz)		
		100≤F<1k	1k≤F<10k	10k≤F
ME-UW, ME-UWA, ME-SWB ME-HC, ME-HPC, ME-HPD ME-FC, ME-FD, ME-FH ME-HLB, ME-HT, ME-UWN ME-SWN, ME-HWN	C<100	1.00	1.30	1.50
	100≤C<1000	1.00	1.20	1.30
	1000≤C	1.00	1.13	1.15
ME-AX ME-CX	C≤68	0.50	0.80	1.00
	68<C≤220	0.55	0.85	1.00
	220<C≤1000	0.65	0.90	1.00
	1000<C	0.75	0.90	1.00
ME-CZ ME-CA	C≤47	0.50	0.80	1.00
	47<C≤220	0.55	0.85	1.00
	220<C≤1000	0.65	0.90	1.00
	1000<C	0.75	0.90	1.00
ME-FZ ME-PX(10 to 100V)	C<4.7	0.40	0.70	1.00
	4.7≤C<100	0.55	0.80	1.00
	100≤C<1000	0.70	0.90	1.00
	1000≤C	0.90	0.95	1.00
ME-FAZ	C<100	0.35	0.54	1.00
	100≤C	0.50	0.70	1.00

Series	Capacitance:C(μF)	Frequency:F(Hz)			
		100≤F<1k	1k≤F<10k	10k≤F<100k	100k≤F
ME-UAX ME-SAX	C≤4.7	0.45	0.60	0.90	1.00
	4.7<C≤33	0.60	0.75	0.95	1.00
	33<C	0.75	0.85	0.95	1.00
ME-UZ ME-SZ	C≤4.7	0.50	0.65	0.90	1.00
	4.7<C≤33	0.65	0.75	0.95	1.00
	33<C	0.75	0.85	0.95	1.00
ME-WX ME-WA	C≤33	0.55	0.75	0.90	1.00
	33<C≤330	0.70	0.85	0.92	1.00
	330<C≤1000	0.75	0.90	0.94	1.00
	1000<C	0.80	0.95	0.96	1.00
ME-WG	C≤820	0.50	0.85	0.94	1.00
	820<C≤1800	0.55	0.88	0.96	1.00
	1800<C	0.60	0.90	0.98	1.00
ME-SWG	C≤56	0.22	0.45	0.65	1.00
	56<C≤330	0.28	0.50	0.65	1.00

Series	Capacitance:C(μF)	Frequency:F(Hz)				
		50	120	300	1k	10k≤F
CE-FS(160 to 400) CE-LH(160 to 400)	ALL ITEM	0.75	1.00	1.20	1.30	1.50
ME-PX(160 to 400)	C≤33	0.75	1.00	1.25	1.50	1.75
	33<C	0.80	1.00	1.15	1.30	1.40

## Aluminum Electrolytic Capacitors with Hybrid Semiconductor **HS-CON™**

## Aluminum Electrolytic Capacitors with Hybrid Electrolyte **EPcap**

HS-CON and EPcap are electrolytic capacitors with hybrid cathode electrolyte.

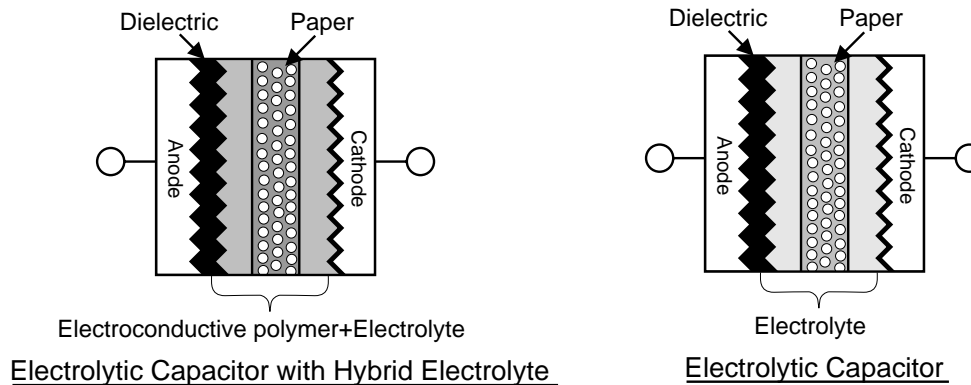
High conductive electrolyte (solid conductive polymer) is combined.

HS-CON and EPcap have very low ESR at high frequency as compared with electrolytic capacitors.

The structure of hybrid cathode electrolyte enables HS-CON and EPcap to have the same self-healing function as aluminum electrolytic capacitors.

HS-CON have hi-reliability product of 125 degrees Celsius (HVP series) and high voltage up to 63V.

### [Basic Construction]



## ■ Feature

1. Super low ESR(Downsize and upgrade your circuit)
  - Excellent noise absorption capability at high frequency.
  - High ripple current. Suitable for smoothing circuit of switching regulator.
2. Excellent low temperature characteristics (Stable performance at low temperature range)
  - Suitable for the applications that operate at low temperature.
3. Self-healing property of liquid electrolyte(Compared to solid capacitors, short circuit mode seldom happen and L.C. is lower.
4. Rated voltage is up to 63V.
5. Applying a voltage up to the rated voltage is guaranteed.(Voltage derating is not needed)
6. RoHS compliance and lead-free(Environmental friendly)

## ■ Applications

Automotive electric • Network • Industrial • Flat-TV(LCD • PDP etc.) • PC(Server etc.) • Power supply(Inverter etc.)

## HVH Series

Super Low ESR

High Voltage, Long Life



- 105°C, 5000 to 10000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items	Specifications			
Rated voltage (V)	25	35	50	63
Surge voltage (V)	32	44	63	79
Category temperature range (°C)	-55 to +105			
Capacitance tolerance (%)	±20			(120Hz/20°C)
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.16			
Leakage current (L.C.) (μA/after 2min.) (MAX.)*	The greater value of either 0.05CV or 100			
Temperature characteristics	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	1 to 2.5		
Impedance ratio at 120Hz	Z <sub>105°C</sub> /Z <sub>20°C</sub>	0.6 to 1.0		
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ8 to φ10 ; 10000hrs. (25V ; 7000hrs.), φ6.3 ; 5000hrs.		
	ΔC/C	Within ±30% of the initial value		
	tanδ	≤ Twice the initial specified value		
	ESR	≤ Twice the initial specified value		
	L.C.	≤ The initial specified value		

\* ; In case of some problems for measured values, measure after voltage treatment.  
Voltage treatment ; Applying rated voltage for 120 minutes at 105°C.

### Marking, Dimensions

(Unit : mm)

D <sup>+0.5MAX.</sup>	L <sup>+0.3</sup>	W <sup>+0.2</sup>	H <sup>+0.2</sup>	C <sup>+0.2</sup>	R	P <sup>+0.2</sup>
6.3	6.0	6.6	6.6	7.3	0.5 to 0.8	2.2
6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.2
8	10.5	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.5	10.3	10.3	11.0	1.1 to 1.4	4.6

A pressure relief vent is attached to products over φD=8

### Size List, E.S.R., Rated Ripple Current

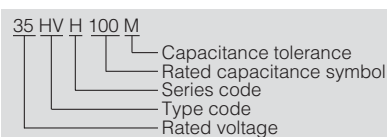
μF \ V	25		35		50		63	
2.7							6.3 x 6.0	150 960
3.9							6.3 x 7.7	100 1060
5.6					6.3 x 6.0	120 980		
10					6.3 x 7.7	80 1200		
22							8 x 10.5	40 1560
27			6.3 x 6.0	100 1080				
33					8 x 10.5	35 1670	10 x 10.5	30 2100
47	6.3 x 6.0	60 1270	6.3 x 7.7	60 1300				
56	6.3 x 7.7	45 1400			10 x 10.5	25 2320		
68								
100			8 x 10.5	30 1800				
150	8 x 10.5	27 1900	10 x 10.5	23 2470				
270	10 x 10.5	22 2530						

Case size ; φD x L (mm)

E.S.R. (mΩ)  
MAX. at 100kHz, 20°C

Rated ripple current  
mAr.m.s. (100kHz, 105°C)

Model No.



## HVP Series

125°C Super Low ESR

High Voltage, High Reliability



- 125°C, 1500 to 3000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications			
Rated voltage (V)		25	35	50	63
Surge voltage (V)		32	44	63	79
Category temperature range (°C)		-55 to +125			
Capacitance tolerance (%)		±20 (120Hz/20°C)			
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.16			
Leakage current (L.C.) (μA/after 2min.) (MAX.)*		The greater value of either 0.05CV or 100			
Temperature characteristics	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	1 to 2.5			
Impedance ratio at 120Hz	Z <sub>125°C</sub> /Z <sub>20°C</sub>	0.6 to 1.0			
Endurance 125°C rated voltage applied (With the rated ripple current)	Test	φ8 to φ10 ; 3000hrs. (25V ; 2500hrs.) ; φ6.3 ; 2000hrs. (25V ; 1500hrs.)			
	ΔC/C	Within ±30% of the initial value			
	tanδ	≤ Twice the initial specified value			
	ESR	≤ Twice the initial specified value			
	L.C.	≤ The initial specified value			

\* ; In case of some problems for measured values, measure after voltage treatment.  
Voltage treatment ; Applying rated voltage for 120 minutes at 125°C.

### Marking, Dimensions

(Unit : mm)

D <sup>+0.5MAX.</sup>	L <sup>±0.3</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.2
8	10.5	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.5	10.3	10.3	11.0	1.1 to 1.4	4.6

A pressure relief vent is attached to products over φD=8

### Size List, E.S.R., Rated Ripple Current

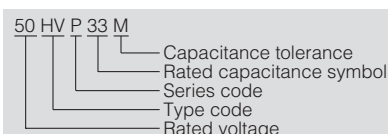
μF \ V	25		35		50		63	
3.9							6.3 x 7.7	100 740
10					6.3 x 7.7	80 840		
22							8 x 10.5	40 1090
33					8 x 10.5	35 1170	10 x 10.5	30 1260
47			6.3 x 7.7	60 910				
56					10 x 10.5	25 1390		
68	6.3 x 7.7	45 980						
100			8 x 10.5	30 1260				
150	8 x 10.5	27 1330	10 x 10.5	23 1480				
270	10 x 10.5	22 1520						

Case size ; φD x L (mm)

E.S.R. (mΩ)  
MAX. at 100kHz, 20°C

Rated ripple current  
mAr.m.s. (100kHz, 125°C)

Model No.



## CE-EX Series Low ESR at High Frequency



- 105°C, 2000 to 3000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications		
Rated voltage (V)	4	6.3	10	
Surge voltage (V)	4.6	7.2	11.5	
Category temperature range (°C)	-55 to +105			
Capacitance tolerance (%)	±20			(120Hz/20°C)
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.24	0.22	0.20	
Leakage current (L.C.) (μA/after 2min.) (MAX.)	The greater value of either 0.1CV or 50			
Temperature characteristics	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	1 to 2.5		
Impedance ratio at 120Hz	Z <sub>105°C</sub> /Z <sub>20°C</sub>	0.6 to 1.0		
Endurance	Test	φ6.3 : 2000hrs., φ8 to φ10 : 3000hrs. (4V : 2000hrs.)		
105°C	ΔC/C	Within ±30% of the initial value		
rated voltage applied	tanδ	≤ Twice the initial specified value		
(With the rated ripple current)	L.C.	≤ The initial specified value		

### Marking, Dimensions

D <sup>+0.5MAX.</sup>	L <sup>±0.3</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
6.3	6.0	6.6	6.6	7.3	0.5 to 0.8	2.2
8	10.5	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.5	10.3	10.3	11.0	1.1 to 1.4	4.6

A pressure relief vent is attached to products over φD=8

### Size List, E.S.R., Rated Ripple Current

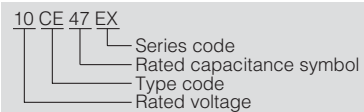
μF	V	4			6.3			10		
		Case size	E.S.R.	Ripple current	Case size	E.S.R.	Ripple current	Case size	E.S.R.	Ripple current
22							6.3 x 6.0	60	1020	
33							6.3 x 6.0	60	1020	
47							6.3 x 6.0	60	1020	
100					6.3 x 6.0	50	1120	8 x 10.5	30	1550
150								8 x 10.5	30	1550
220					8 x 10.5	30	1550	8 x 10.5	30	1550
330					8 x 10.5	30	1550	10 x 10.5	25	2090
390					8 x 10.5	30	1550	10 x 10.5	25	2090
470	8 x 10.5	30	1550	10 x 10.5	25	2090				
560				10 x 10.5	25	2090				
680	10 x 10.5	25	2090							
820	10 x 10.5	23	2180							

Case size ; φD x L (mm)

E.S.R. (mΩ)  
MAX. at 100kHz, 20°C

Rated ripple current  
mAr.m.s. (100kHz, 105°C)

Model No.



## CE-BJ Series

Super Low Profile  
3.25mm Height

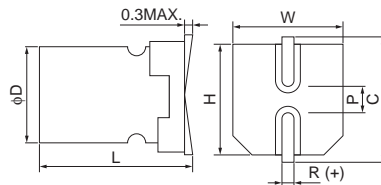
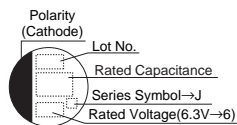


- Solvent proof (within 2 minutes)

### Specifications

Items	Specifications							
Rated voltage (V)	4	6.3	10	16	25	35	50	
Category temperature range (°C)	-40 to +85							
Capacitance tolerance (%)	±20 (120Hz/20°C)							
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.40	0.35	0.24	0.20	0.16	0.14	0.12	
Leakage current (L.C.) (μA/after 2min.) (MAX.)	0.01CV							
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	7	4	3	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	15	10	8	6	4	4	4
Endurance 85°C, 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value						
	tanδ	≤ Twice the initial specified value						
	L.C.	≤ The initial specified value						

### Marking, Dimensions



(Unit : mm)

D <sup>+0.5MAX.</sup>	L <sup>+0.1 -0.2</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
6.3	3.25	6.6	6.6	7.3	0.5 to 0.8	2.2

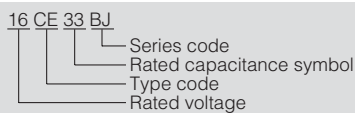
### Size List, Rated Ripple Current

μF \ V	4	6.3	10	16	25	35	50
10							6.3 x 3.25   31
15						6.3 x 3.25   44	
22					6.3 x 3.25   46		
33				6.3 x 3.25   46			
47			6.3 x 3.25   51				
68		6.3 x 3.25   60					
82	6.3 x 3.25   60						

Case size ; φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 85°C)

#### Model No.



## CE-BE Series

Miniature Low Profile

3.9mm Height

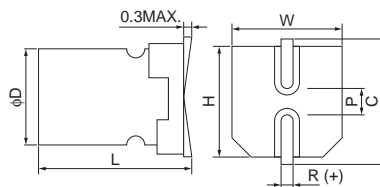
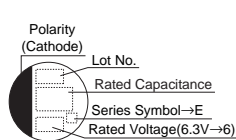


- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications						
Rated voltage (V)		4	6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +85						
Capacitance tolerance (%)		±20 (120Hz/20°C)						
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.40	0.30	0.24	0.20	0.16	0.14	0.12
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3						
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	7	4	3	2	2	2	2
	Z-40°C/Z20°C	15	10	8	6	4	4	4
Endurance 85°C, 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value						
	tanδ	≤ Twice the initial specified value						
	L.C.	≤ The initial specified value						

### Marking, Dimensions



(Unit : mm)

D <sup>+0.5MAX.</sup>	L <sup>+0.1 -0.2</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
5	3.9	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	3.9	6.6	6.6	7.3	0.5 to 0.8	2.2

### Size List, Rated Ripple Current

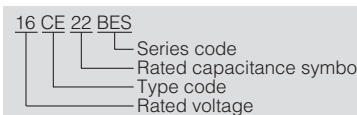
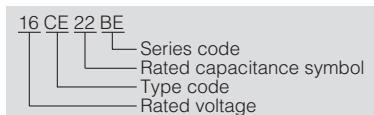
μF \ V	4	6.3	10	16	25	35	50
1.0							5 x 3.9 8.4
2.2							5 x 3.9 14
3.3							5 x 3.9 17
4.7					5 x 3.9 18	5 x 3.9 18	5 x 3.9 21
10				5 x 3.9 25	5 x 3.9 30	5 x 3.9 29	6.3 x 3.9 33
22		5 x 3.9 33	5 x 3.9 35	6.3 x 3.9*45(37)	6.3 x 3.9 50	6.3 x 3.9 49	
33	5 x 3.9 33	5 x 3.9 40	6.3 x 3.9*50(43)	6.3 x 3.9 50	6.3 x 3.9 60		
47	5 x 3.9 40	6.3 x 3.9*60(48)	6.3 x 3.9 55	6.3 x 3.9 60			
68	6.3 x 3.9*60(48)	6.3 x 3.9 70					
100	6.3 x 3.9*70(58)	6.3 x 3.9 75					
180	6.3 x 3.9 85						

\* ; CE-BES (5 x 3.9)

Case size ; φD x L (mm)

Rated ripple current  
mA r.m.s. (120Hz, 85°C)  
( ) ; CE-BES series

#### Model No.



## CE-BD Series

Miniature Low Profile

4.5mm Height

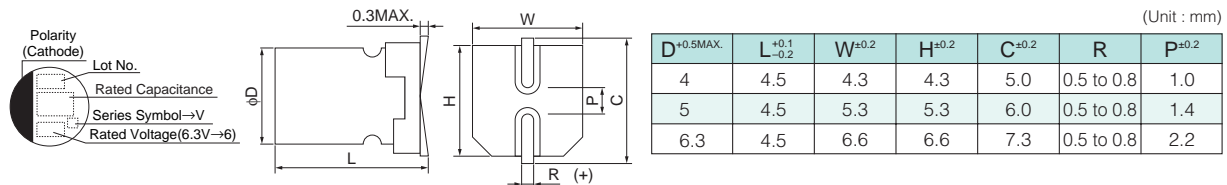


- Solvent proof (within 2 minutes)

### Specifications

Items	Specifications							
Rated voltage (V)	4	6.3	10	16	25	35	50	
Category temperature range (°C)	-40 to +85							
Capacitance tolerance (%)	±20 (120Hz/20°C)							
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.40	0.30	0.24	0.20	0.16	0.14	0.12	
Leakage current (L.C.) (μA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3							
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	7	4	3	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	15	10	8	6	4	4	4
Endurance 85°C, 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value						
	tanδ	≤ Twice the initial specified value						
	L.C.	≤ The initial specified value						

### Marking, Dimensions



### Size List, Rated Ripple Current

μF \ V	4	6.3	10	16	25	35	50
0.10							4 x 4.5   1.0
0.22							4 x 4.5   2.0
0.33							4 x 4.5   2.8
0.47							4 x 4.5   4.0
1.0							4 x 4.5   8.4
2.2							4 x 4.5   14
3.3							4 x 4.5   17
4.7					4 x 4.5   17	4 x 4.5   18	5 x 4.5   21
10				4 x 4.5   23	5 x 4.5   27	5 x 4.5   29	6.3 x 4.5   33
22		4 x 4.5   28	5 x 4.5   33	5 x 4.5   37	6.3 x 4.5   47	6.3 x 4.5   49	
33	4 x 4.5   28	5 x 4.5   37	5 x 4.5   41	6.3 x 4.5   51	6.3 x 4.5   57		
47	4 x 4.5   33	5 x 4.5   45	6.3 x 4.5   53	6.3 x 4.5   61			
100	5 x 4.5   56	6.3 x 4.5   70	6.3 x 4.5   74				
220	6.3 x 4.5   96						

Model No. 16 CE 22 BD  
 CE: Series code  
 22: Rated capacitance symbol  
 BD: Type code  
 16: Rated voltage

Case size ; φD x L (mm)

Rated ripple current  
 mAr.m.s. (120Hz, 85°C)



## CE-BSS Series

Miniature High Capacitance  
5.4mm Height



- This series has one size smaller diameter than CE-BS series. (ex.  $\phi 6.3 \rightarrow \phi 5$ )
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +85					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.28	0.24	0.20	0.16	0.14	0.12
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	4	3	2	2	2	2
	Z-40°C/Z20°C	10	8	6	4	4	4
Endurance 85°C, 2000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value					
	tanδ	≤ Twice the initial specified value					
	L.C.	≤ The initial specified value					

### Marking, Dimensions

Polarity (Cathode)  
 Lot No.  
 Rated Capacitance  
 Series Symbol → S  
 Rated Voltage (6.3V → 6)

(Unit : mm)

D <sup>+0.5MAX.</sup>	L <sup>+0.1 -0.2</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
4	5.4	4.3	4.3	5.0	0.5 to 0.8	1.0
5	5.4	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	5.4	6.6	6.6	7.3	0.5 to 0.8	2.2

### Size List, Rated Ripple Current

μF \ V	6.3	10	16	25	35	50
4.7						4 x 5.4   18
10				4 x 5.4   20	4 x 5.4   20	5 x 5.4   27
22		4 x 5.4   28	4 x 5.4   28	5 x 5.4   35	5 x 5.4   36	6.3 x 5.4   40
33	4 x 5.4   31	4 x 5.4   32	5 x 5.4   40	5 x 5.4   42	6.3 x 5.4   58	
47	4 x 5.4   36	5 x 5.4   43	5 x 5.4   44	6.3 x 5.4   65		
56	5 x 5.4   46	5 x 5.4   46	5 x 5.4   48	6.3 x 5.4   68		
100	5 x 5.4   47	5 x 5.4   50				
150	6.3 x 5.4   71	6.3 x 5.4   76				
220	6.3 x 5.4   74					

Case size : φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 85°C)

Model No. 16 CE 22 BSS

- 16: Rated voltage
- CE: Series code
- 22: Rated capacitance symbol
- B: Type code
- SS: Rated voltage

## CE-C·BS Series

Miniature, 3mm Diameter (CE-C series)

Standard (CE-BS series)



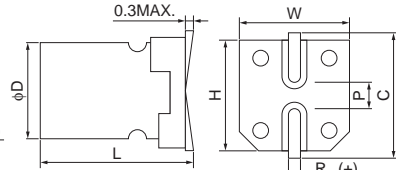
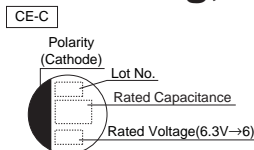
- Solvent proof (within 2 minutes)

### Specifications

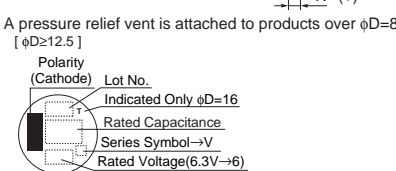
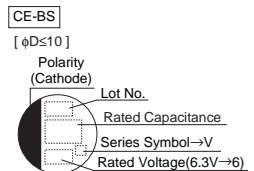
Items		Specifications									
Rated voltage (V)		4	6.3	10	16	25	35	50	63	100	
Category temperature range (°C)		-40 to +85									
Capacitance tolerance (%)		±20 (120Hz/20°C)									
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	φ3	0.40	0.30	—	0.19	0.16	0.14	0.14	—	—	
	φ4 to φ6.3	0.35	0.26	0.20	0.16	0.14	0.12	0.12	0.12	0.10	
	φ8 to φ16	0.40	0.30	0.24	0.20	0.16	0.14	0.12	0.12	0.10	
When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.											
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3									
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	7	4	3	2	2	2	2	2	2	
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	15	8	6	4	4	3	3	3	3	
Endurance 85°C, 2000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ± 25% of the initial value									
	tanδ	≤ Twice the initial specified value									
	L.C.	≤ The initial specified value									

### Marking, Dimensions

(Unit : mm)



D+0.5MAX.	L	W ±0.2	H ±0.2	C ±0.2	R	P ±0.2
3	5.4 <sup>+0.1</sup> <sub>-0.2</sub>	3.3	3.3	3.9	0.45 to 0.75	0.6
4	5.4 <sup>+0.1</sup> <sub>-0.2</sub>	4.3	4.3	5.0	0.5 to 0.8	1.0
5	5.4 <sup>+0.1</sup> <sub>-0.2</sub>	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	5.4 <sup>+0.1</sup> <sub>-0.2</sub>	6.6	6.6	7.3	0.5 to 0.8	2.2
4	6.0 ±0.3	4.3	4.3	5.0	0.5 to 0.8	1.0
6.3	6.0 ±0.3	6.6	6.6	7.3	0.5 to 0.8	2.2
6.3	7.7 ±0.3	6.6	6.6	7.3	0.5 to 0.8	2.2
8	10.2 ±0.3	8.3	8.3	9.0	0.7 to 1.0	3.2
10	7.7 ±0.3	10.3	10.3	11.0	1.1 to 1.4	4.6
10	10.2 ±0.3	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 ±0.5	12.8	12.8	13.5	1.1 to 1.4	4.6
16	16.5 ±0.5	16.3	16.3	17.3	1.8 to 2.1	7.0

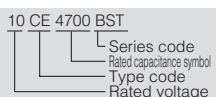
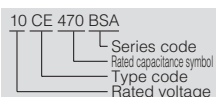
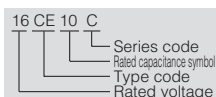
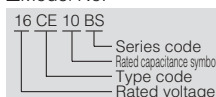


A pressure relief vent is attached to products over φD=8 [φD≥12.5]

### Size List, Rated Ripple Current

μF	4	6.3	10	16	25	35	50	63	100
0.1 to 0.47							4 x 5.4* <sup>1</sup> to 5 (1 to 4)	4 x 5.4 <sup>1</sup> 1 to 5	
1.0							4 x 5.4* <sup>1</sup> 10 (8)	4 x 5.4 <sup>1</sup> 10	4 x 6.0 <sup>1</sup> 10
2.2						*	(8)	4 x 5.4 <sup>1</sup> 15	6.3 x 6.0 <sup>1</sup> 20
3.3						*	(10)	4 x 5.4 <sup>1</sup> 18	6.3 x 6.0 <sup>1</sup> 28
4.7					4 x 5.4* <sup>1</sup>	19 (12)	4 x 5.4 <sup>1</sup> 20	5 x 5.4 <sup>1</sup> 23	6.3 x 6.0 <sup>1</sup> 35
10				4 x 5.4* <sup>1</sup> 25 (18)	5 x 5.4 <sup>1</sup> 28	5 x 5.4 <sup>1</sup> 30	6.3 x 5.4 <sup>1</sup> 34	6.3 x 5.4 <sup>1</sup> 34	6.3 x 7.7 <sup>1</sup> 50
22	*	(19)	4 x 5.4* <sup>1</sup> 31 (19)	5 x 5.4 <sup>1</sup> 35	5 x 5.4 <sup>1</sup> 39	6.3 x 5.4 <sup>1</sup> 52	6.3 x 5.4 <sup>1</sup> 54	6.3 x 6.0 <sup>1</sup> 60	6.3 x 7.7 <sup>1</sup> 70
33	4 x 5.4 <sup>1</sup>	26	5 x 5.4 <sup>1</sup> 39	5 x 5.4 <sup>1</sup> 43	6.3 x 5.4 <sup>1</sup> 57	6.3 x 5.4 <sup>1</sup> 63	6.3 x 6.0 <sup>1</sup> 60	6.3 x 7.7 <sup>1</sup> 85	8 x 10.2 <sup>1</sup> 120
47	4 x 5.4 <sup>1</sup>	34	5 x 5.4 <sup>1</sup> 47	6.3 x 5.4 <sup>1</sup> 59	6.3 x 5.4 <sup>1</sup> 68	6.3 x 6.0 <sup>1</sup> 68	6.3 x 6.0 <sup>1</sup> 70	6.3 x 7.7 <sup>1</sup> 90	8 x 10.2 <sup>1</sup> 170
68								8 x 10.2 <sup>1</sup> 180	12.5 x 13.5 <sup>1</sup> 330
82									12.5 x 13.5 <sup>1</sup> 350
100	5 x 5.4 <sup>1</sup>	61	6.3 x 5.4 <sup>1</sup> 71	6.3 x 5.4 <sup>1</sup> 76	6.3 x 5.4 <sup>1</sup> 86	6.3 x 7.7 <sup>1</sup> 130	6.3 x 7.7 <sup>1</sup> 120	8 x 10.2 <sup>1</sup> 200	10 x 10.2 <sup>1</sup> 280
150			6.3 x 6.0 <sup>1</sup> 88	6.3 x 7.7 <sup>1</sup> 135	8 x 10.2 <sup>1</sup> 200	8 x 10.2 <sup>1</sup> 220	8 x 10.2 <sup>1</sup> 220		16 x 16.5 <sup>1</sup> 550
220	6.3 x 5.4 <sup>1</sup>	82	6.3 x 6.0 <sup>1</sup> 95	6.3 x 7.7 <sup>1</sup> 150	6.3 x 7.7 <sup>1</sup> 150	8 x 10.2 <sup>1</sup> 250	10 x 7.7 <sup>1</sup> 250	10 x 10.2 <sup>1</sup> 320	12.5 x 13.5 <sup>1</sup> 410
330	6.3 x 6.0 <sup>1</sup>	102	6.3 x 7.7 <sup>1</sup> 150	8 x 10.2 <sup>1</sup> 280	8 x 10.2 <sup>1</sup> 280	8 x 10.2 <sup>1</sup> 310	10 x 10.2 <sup>1</sup> 340	12.5 x 13.5 <sup>1</sup> 520	
390								12.5 x 13.5 <sup>1</sup> 550	
470	6.3 x 7.7 <sup>1</sup>	150	8 x 10.2 <sup>1</sup> 300	8 x 10.2 <sup>1</sup> 300	8 x 10.2 <sup>1</sup> 300	10 x 10.2 <sup>1</sup> 430	12.5 x 13.5 <sup>1</sup> 590	16 x 16.5 <sup>1</sup> 700	
680			8 x 10.2 <sup>1</sup> 300	10 x 7.7 <sup>1</sup> 300	10 x 10.2 <sup>1</sup> 450		12.5 x 13.5 <sup>1</sup> 610	16 x 16.5 <sup>1</sup> 1000	
1000	10 x 7.7 <sup>1</sup>	330	8 x 10.2 <sup>1</sup> 330	10 x 10.2 <sup>1</sup> 450		12.5 x 13.5 <sup>1</sup> 660	16 x 16.5 <sup>1</sup> 1000	16 x 16.5 <sup>1</sup> 940	
1500			10 x 10.2 <sup>1</sup> 450		12.5 x 13.5 <sup>1</sup> 710		16 x 16.5 <sup>1</sup> 1060		
2200				12.5 x 13.5 <sup>1</sup> 730		16 x 16.5 <sup>1</sup> 1150			
3300			12.5 x 13.5 <sup>1</sup> 750		16 x 16.5 <sup>1</sup> 1200				
4700				16 x 16.5 <sup>1</sup> 1260					
6800			16 x 16.5 <sup>1</sup> 1330						

#### Model No.



Rated ripple current  
Case size ; φD x L (mm)  
\* ; CE-C series (3 x 5.4) mAr.m.s. (120Hz, 85°C)  
10 x 7.7 ; CE-BSA series ( ) ; CE-C series  
16 x 16.5 ; CE-BST series

## CE-FE Series

Miniature Low Profile

3.9mm Height

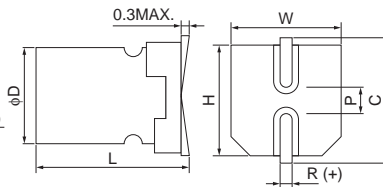
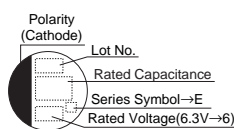


- 105°C, 1000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +105					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.38	0.32	0.20	0.16	0.14	0.14
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	4	3	2	2	2	2
	Z-40°C/Z20°C	10	8	6	4	4	4
Endurance 105°C, 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±30% of the initial value					
	tanδ	≤ 3 times the initial specified value					
	L.C.	≤ The initial specified value					

### Marking, Dimensions



(Unit : mm)

D <sup>+0.5MAX.</sup>	L <sup>+0.1 -0.2</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
5	3.9	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	3.9	6.6	6.6	7.3	0.5 to 0.8	2.2

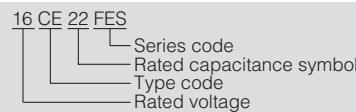
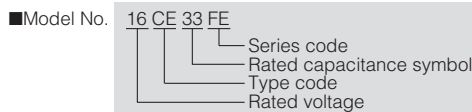
### Size List, Rated Ripple Current

V	6.3		10		16		25		35		50	
μF												
1.0											5 x 3.9	6
2.2											5 x 3.9	10
3.3											5 x 3.9	12
4.7							5 x 3.9	13	5 x 3.9	13	5 x 3.9	16
10					5 x 3.9	18	5 x 3.9	21	5 x 3.9	22	6.3 x 3.9	23
22	5 x 3.9	23	5 x 3.9	25	6.3 x 3.9*	31(26)	6.3 x 3.9	35	6.3 x 3.9	34		
33	5 x 3.9	28	6.3 x 3.9*	35(30)	6.3 x 3.9	35	6.3 x 3.9	42				
47	6.3 x 3.9*	42(34)	6.3 x 3.9	38	6.3 x 3.9	42						
68	6.3 x 3.9	49										
100	6.3 x 3.9	52										

\* ; CE-FES (5 x 3.9)

Case size ; φD x L (mm)

Rated ripple current  
mA r.m.s. (120Hz, 105°C)  
( ) ; CE-FES series



## CE-FD Series

Miniature Low Profile

4.5mm Height

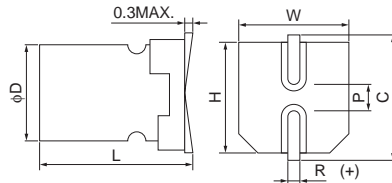
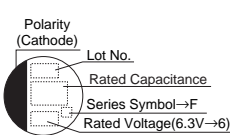


- 105°C, 1000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +105					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.35	0.28	0.20	0.16	0.14	0.12
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	4	3	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	10	8	6	4	4	4
Endurance 105°C, 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value					
	tanδ	≤ 3 times the initial specified value					
	L.C.	≤ The initial specified value					

### Marking, Dimensions



(Unit : mm)

D <sup>+0.5MAX.</sup>	L <sup>+0.1 -0.2</sup>	W <sup>+0.2</sup>	H <sup>+0.2</sup>	C <sup>+0.2</sup>	R	P <sup>+0.2</sup>
4	4.5	4.3	4.3	5.0	0.5 to 0.8	1.0
5	4.5	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	4.5	6.6	6.6	7.3	0.5 to 0.8	2.2

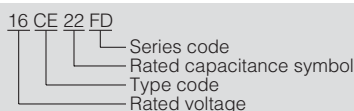
### Size List, Rated Ripple Current

μF \ V	6.3	10	16	25	35	50
0.10						4 x 4.5   0.7
0.22						4 x 4.5   1.4
0.33						4 x 4.5   2.0
0.47						4 x 4.5   2.8
1.0						4 x 4.5   5.9
2.2						4 x 4.5   9.8
3.3						4 x 4.5   12
4.7				4 x 4.5   12	4 x 4.5   13	5 x 4.5   15
10			4 x 4.5   17	5 x 4.5   19	5 x 4.5   21	6.3 x 4.5   24
22	4 x 4.5   20	5 x 4.5   24	5 x 4.5   26	6.3 x 4.5   33	6.3 x 4.5   35	
33	5 x 4.5   26	5 x 4.5   29	6.3 x 4.5   36	6.3 x 4.5   40		
47	5 x 4.5   32	6.3 x 4.5   38	6.3 x 4.5   43			
100	6.3 x 4.5   49	6.3 x 4.5   52				

Case size ; φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 105°C)

Model No.



## CE-LD Series

Low Profile 4.5mm Height

Long Life



- 105°C, 2000 to 3000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +105					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.35	0.30	0.20	0.16	0.14	0.12
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	4	3	2	2	2	2
	Z-40°C/Z20°C	10	8	6	4	4	4
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ4 to φ5 : 2000hrs., φ6.3 : 3000hrs.					
	ΔC/C	Within ±30% of the initial value					
	tanδ	≤ 3 times the initial specified value					
	L.C.	≤ The initial specified value					

### Marking, Dimensions

Polarity (Cathode)

(Unit : mm)						
D <sup>+0.5MAX.</sup>	L <sup>+0.1 -0.2</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
4	4.5	4.3	4.3	5.0	0.5 to 0.8	1.0
5	4.5	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	4.5	6.6	6.6	7.3	0.5 to 0.8	2.2

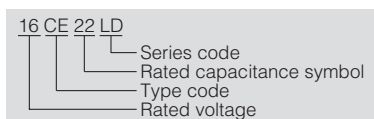
### Size List, Rated Ripple Current

μF \ V	6.3		10		16		25		35		50	
	0.10											4 x 4.5
0.22											4 x 4.5	1.4
0.33											4 x 4.5	2.0
0.47											4 x 4.5	2.8
1.0											4 x 4.5	5.9
2.2											4 x 4.5	10
3.3											4 x 4.5	12
4.7							4 x 4.5	12	4 x 4.5	13	5 x 4.5	15
10					4 x 4.5	17	5 x 4.5	19	5 x 4.5	24	6.3 x 4.5	24
22	4 x 4.5	20	5 x 4.5	24	5 x 4.5	26	6.3 x 4.5	33	6.3 x 4.5	35		
33	5 x 4.5	26	5 x 4.5	29	6.3 x 4.5	36	6.3 x 4.5	40				
47	5 x 4.5	32	6.3 x 4.5	38	6.3 x 4.5	43						
100	6.3 x 4.5	49	6.3 x 4.5	52								

Case size ; φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 105°C)

#### Model No.



## CE-FS Series 105°C Standard



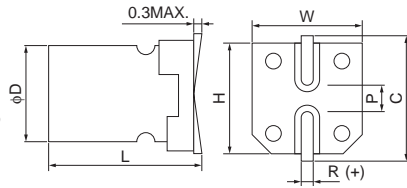
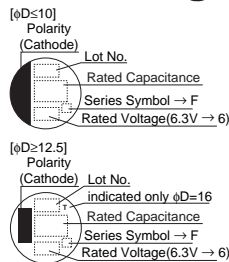
- 105°C, 1000 to 2000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications								
Rated voltage (V)		6.3	10	16	25	35	50	63	100	
Category temperature range (°C)		-55 to +105							-40 to +105	
Capacitance tolerance (%)		±20							(120Hz/20°C)	
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	φ4 to φ6.3	0.24	0.20	0.16	0.14	0.12	0.10	0.12	0.10	
	φ8 to φ16	0.28	0.24	0.20	0.16	0.14	0.12	0.12	0.10	
		When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.								
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3								
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	3	2	2	2	2	2	3	
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	8	5	4	3	3	3	3	-	
Endurance	Test	φ 4 to φ6.3, φ10 x 7.7 : 1000hrs., φ8 to φ16 : 2000hrs.								
105°C	ΔC/C	Within ± 25% of the initial value								
rated voltage applied (With the rated ripple current)	tanδ	≤ Twice the initial specified value								
	L.C.	≤ The initial specified value								

### Marking, Dimensions

(Unit : mm)

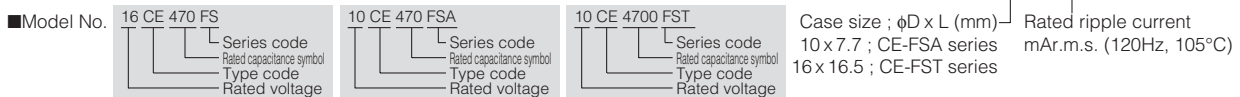


A pressure relief vent is attached to products over φD=8

D+0.5MAX.	L	W ±0.2	H ±0.2	C ±0.2	R	P ±0.2
4	5.4 <sup>+0.1</sup>	4.3	4.3	5.0	0.5 to 0.8	1.0
5	5.4 <sup>+0.1</sup>	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	5.4 <sup>+0.1</sup>	6.6	6.6	7.3	0.5 to 0.8	2.2
4	6.0 <sup>+0.3</sup>	4.3	4.3	5.0	0.5 to 0.8	1.0
6.3	6.0 <sup>+0.3</sup>	6.6	6.6	7.3	0.5 to 0.8	2.2
6.3	7.7 <sup>+0.3</sup>	6.6	6.6	7.3	0.5 to 0.8	2.2
8	10.2 <sup>+0.3</sup>	8.3	8.3	9.0	0.7 to 1.0	3.2
10	7.7 <sup>+0.3</sup>	10.3	10.3	11.0	1.1 to 1.4	4.6
10	10.2 <sup>+0.3</sup>	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 <sup>+0.5</sup>	12.8	12.8	13.5	1.1 to 1.4	4.6
16	16.5 <sup>+0.5</sup>	16.3	16.3	17.3	1.8 to 2.1	7.0

### Size List, Rated Ripple Current

μF	6.3		10		16		25		35		50		63		100	
0.1 to 0.47											4 x 5.4	10.7 to 3.5	4 x 5.4	10.7 to 3.5		
1.0											4 x 5.4	7	4 x 5.4	7	4 x 6.0	7
2.2											4 x 5.4	11	4 x 5.4	11	6.3 x 6.0	14
3.3											4 x 5.4	13	5 x 5.4	14	6.3 x 6.0	20
4.7							4 x 5.4	13	4 x 5.4	14	5 x 5.4	16	5 x 5.4	16	6.3 x 6.0	25
10					4 x 5.4	18	5 x 5.4	20	5 x 5.4	21	6.3 x 5.4	24	6.3 x 5.4	24	6.3 x 7.7	35
22	4 x 5.4	22	5 x 5.4	25	5 x 5.4	27	6.3 x 5.4	36	6.3 x 5.4	38	6.3 x 6.0	42	6.3 x 7.7	49	8 x 10.2	84
33	5 x 5.4	27	5 x 5.4	30	6.3 x 5.4	40	6.3 x 5.4	44	6.3 x 6.0	42	6.3 x 7.7	60	8 x 10.2	112	10 x 10.2	133
47	5 x 5.4	33	6.3 x 5.4	41	6.3 x 5.4	48	6.3 x 6.0	48	6.3 x 6.0	49	6.3 x 7.7	63	8 x 10.2	119	12.5 x 13.5	240
68													8 x 10.2	126	12.5 x 13.5	245
82											10 x 7.7	140				
100	6.3 x 5.4	50	6.3 x 5.4	53	6.3 x 5.4	60	6.3 x 7.7	91	6.3 x 7.7	84	8 x 10.2	140	10 x 10.2	196	16 x 16.5	490
150			6.3 x 6.0	62	6.3 x 7.7	95	8 x 10.2	140	8 x 10.2	155					16 x 16.5	500
									10 x 7.7	155						
220	6.3 x 6.0	67	6.3 x 7.7	105	6.3 x 7.7	105	8 x 10.2	175	8 x 10.2	190	10 x 10.2	220	12.5 x 13.5	287		
							10 x 7.7	175								
330	6.3 x 7.7	105	8 x 10.2	195	8 x 10.2	195	8 x 10.2	220	10 x 10.2	300	12.5 x 13.5	365				
					10 x 7.7	195										
390											12.5 x 13.5	380				
470	8 x 10.2	210	8 x 10.2	210	8 x 10.2	230	10 x 10.2	300	12.5 x 13.5	410			16 x 16.5	630		
		10 x 7.7	210													
680	8 x 10.2	210			10 x 10.2	310			12.5 x 13.5	430						
	10 x 7.7	210														
1000	8 x 10.2	230	10 x 10.2	310			12.5 x 13.5	460	16 x 16.5	700	16 x 16.5	655				
1500	10 x 10.2	310			12.5 x 13.5	500			16 x 16.5	740						
2200							16 x 16.5	805								
3300	12.5 x 13.5	520														
4700			16 x 16.5	880												
6800	16 x 16.5	930														



Surface Mount Type

## CE-FS Series

105°C Standard  
Mid. and High Voltage

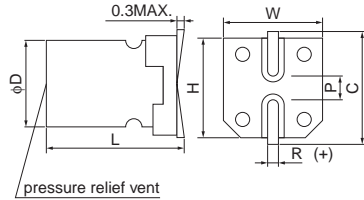
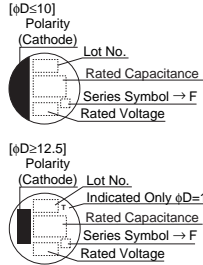


- 160 to 400V 105°C, 1000 to 2000hrs.
- Do not clean the capacitors using solvent.

### Specifications

Items		Specifications			
Rated voltage (V)		160	200	250	400
Category temperature range (°C)		-40 to +105			
Capacitance tolerance (%)		±20			(120Hz/20°C)
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.20			0.25
Leakage current (L.C.) (μA/after 2min.) (MAX.)		CV≤1000 ; 0.03CV+15 CV>1000 ; 0.02CV+25			
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	3	3	3	6
	Z-40°C/Z20°C	6	6	6	10
Endurance 105°C	Test	φ8 : 1000hrs., φ10 to φ16 : 2000hrs.			
rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value			
	tanδ	≤ Twice the initial specified value			
	L.C.	≤ The initial specified value			

### Marking, Dimensions



(Unit : mm)

D <sup>+0.5MAX.</sup>	L <sup>±0.3</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
8	10.5	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.5	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 ±0.5	12.8	12.8	13.5	1.1 to 1.4	4.6
16	16.5 ±0.5	16.3	16.3	17.3	1.8 to 2.1	7.0

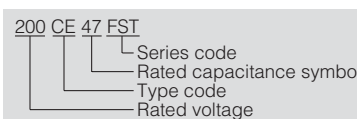
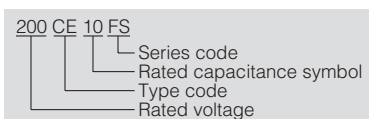
### Size List, Rated Ripple Current

μF	160		200		250		400	
	Case size	Rated ripple current	Case size	Rated ripple current	Case size	Rated ripple current	Case size	Rated ripple current
2.2							8 x 10.5	25
3.3					8 x 10.5	31	10 x 10.5	36
4.7					8 x 10.5	37	10 x 10.5	38
6.8					8 x 10.5	44	12.5 x 13.5	47
10	8 x 10.5	57	10 x 10.5	64	10 x 10.5	64	12.5 x 13.5	57
22	12.5 x 13.5	112	12.5 x 13.5	112	12.5 x 13.5	112	16 x 16.5	115
33	12.5 x 13.5	137	12.5 x 13.5	137	16 x 16.5	150		
47	16 x 16.5	180	16 x 16.5	180	16 x 16.5	180		
68	16 x 16.5	215	16 x 16.5	215				
82	16 x 16.5	235						

Case size ; φD x L (mm)  
16 x 16.5 ; CE-FST series

Rated ripple current  
mAr.m.s. (120Hz, 105°C)

Model No.



## CE-FH Series

Long Life



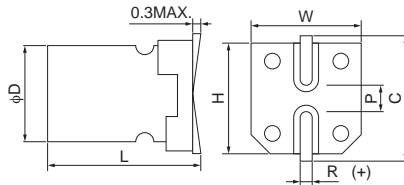
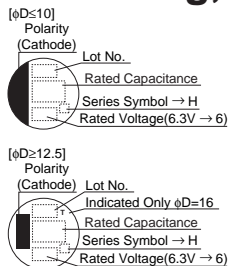
- 105°C, 2000 to 5000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +105					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.30	0.24	0.20	0.16	0.14	0.14
When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.							
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	4	3	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	8	6	4	4	3	3
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ4 to φ6.3 : 2000 hrs., φ8 to φ10 : 3000 hrs., φ12.5 to φ16 : 5000 hrs.					
	ΔC/C	Within ±25% of the initial value					
	tanδ	≤ 2.5 times the initial specified value					
	L.C.	≤ The initial specified value					

### Marking, Dimensions

(Unit : mm)



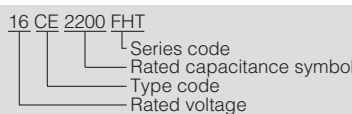
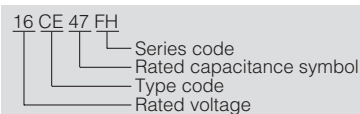
A pressure relief vent is attached to products over φD=8

D <sup>+0.5MAX.</sup>	L <sup>+0.3</sup>	W <sup>+0.2</sup>	H <sup>+0.2</sup>	C <sup>+0.2</sup>	R	P <sup>+0.2</sup>
4	6.0	4.3	4.3	5.0	0.5 to 0.8	1.0
5	6.0	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	6.0	6.6	6.6	7.3	0.5 to 0.8	2.2
6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.2
8	10.2	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.2	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 ±0.5	12.8	12.8	13.5	1.1 to 1.4	4.6
16	16.5 ±0.5	16.3	16.3	17.3	1.8 to 2.1	7.0

### Size List, Rated Ripple Current

μF	6.3		10		16		25		35		50	
0.10											4 x 6.0	0.7
0.22											4 x 6.0	1.6
0.33											4 x 6.0	2.5
0.47											4 x 6.0	3.5
1.0											4 x 6.0	7
2.2											4 x 6.0	11
3.3											4 x 6.0	13
4.7							4 x 6.0	13	4 x 6.0	15	5 x 6.0	19
10					4 x 6.0	18	5 x 6.0	23	5 x 6.0	25	6.3 x 6.0	32
22	4 x 6.0	22	5 x 6.0	27	5 x 6.0	30	6.3 x 6.0	42	6.3 x 6.0	44	6.3 x 7.7	60
33	5 x 6.0	30	5 x 6.0	35	6.3 x 6.0	44	6.3 x 6.0	58	6.3 x 7.7	77	8 x 10.2	140
47	5 x 6.0	36	6.3 x 6.0	46	6.3 x 6.0	60	6.3 x 7.7	91	8 x 10.2	150	8 x 10.2	150
100	6.3 x 6.0	67	6.3 x 6.0	62	6.3 x 7.7	95	8 x 10.2	150	8 x 10.2	160	10 x 10.2	220
220	6.3 x 7.7	105	8 x 10.2	175	8 x 10.2	175	8 x 10.2	195	10 x 10.2	290	12.5 x 13.5	340
330	8 x 10.2	195	8 x 10.2	195	8 x 10.2	210	10 x 10.2	290	12.5 x 13.5	380		
470	8 x 10.2	210	8 x 10.2	210	10 x 10.2	290	12.5 x 13.5	400			16 x 16.5	610
680			10 x 10.2	300			12.5 x 13.5	415				
1000	10 x 10.2	300			12.5 x 13.5	440			16 x 16.5	620		
1500			12.5 x 13.5	480			16 x 16.5	720				
2200	12.5 x 13.5	490			16 x 16.5	785						
3300			16 x 16.5	820								
4700	16 x 16.5	860										

Model No.



Case size ; φD x L (mm)  
16 x 16.5 ; CE-FHT series

Rated ripple current  
mAr.m.s. (120Hz, 105°C)



## CE-GA Series

Low Impedance

5.4mm Height



- 105°C, 1000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items	Specifications							
Rated voltage (V)	6.3	10	16	25	35	50	63	
Category temperature range (°C)	-55 to +105							
Capacitance tolerance (%)	±20 (120Hz/20°C)							
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.24	0.20	0.16	0.14	0.12	0.12	0.12	
Leakage current (L.C.) (μA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3							
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	2	2	2	2	2	2
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	5	4	4	3	3	3	3
Endurance 85°C 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value						
	tanδ	≤ Twice the initial specified value						
	L.C.	≤ The initial specified value						

### Marking, Dimensions

Lot No.

Rated Capacitance

Series Symbol → G

Rated Voltage (6.3V → 6)

0.3MAX.

W

H

R (+)

φD

L

Unit : mm

D <sup>+0.5MAX.</sup>	L <sup>+0.1 -0.2</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>+0.2</sup>
4	5.4	4.3	4.3	5.0	0.5 to 0.8	1.0
5	5.4	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	5.4	6.6	6.6	7.3	0.5 to 0.8	2.2

### Size List, Impedance, Rated Ripple Current

μF \ V	6.3		10		16		25		35		50		63						
0.47									4	6.0	51	4	8.0	30	4	10	15		
1.0									4	3.1	68	4	7.4	37	4	8.0	20		
2.2									4	2.9	68	4	6.6	45	4	8.0	24		
3.3									4	2.7	68	4	5.4	52	5	3.5	40		
4.7							4	2.3	68	4	2.3	68	5	2.9	75	5	3.5	40	
10					4	2.3	68	5	1.1	105	5	1.1	105	6.3	1.3	120	6.3	1.6	65
22	4	2.3	68	5	1.1	105	5	1.1	105	6.3	0.6	155	6.3	0.6	155				
33	5	1.1	105	5	1.1	105	6.3	0.6	155	6.3	0.6	155							
47	5	1.1	105	6.3	0.6	155	6.3	0.6	155	6.3	0.6	155							
100	6.3	0.6	155	6.3	0.6	155	6.3	0.6	155										

Case size ; φD (mm)

Impedance (Ω) MAX. at 100kHz, 20°C

Rated ripple current mAr.m.s. (100kHz, 105°C)

Model No. 10 CE 33 GA

- 10: Rated voltage
- CE: Series code
- 33: Rated capacitance symbol
- GA: Type code

Surface Mount Type  
CE-GA

## CE-AX Series Low Impedance



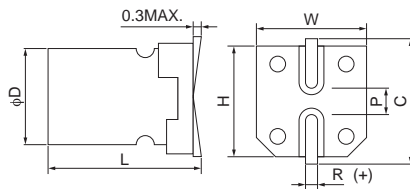
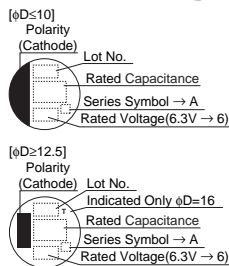
- 105°C, 1000 to 2000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-55 to +105					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	φ4 to φ6.3	0.24	0.20	0.16	0.14	0.12	0.12
	φ8 to φ16	0.28	0.24	0.20	0.16	0.14	0.14
		When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.					
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	2	2	2	2	2
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	5	4	4	3	3	3
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ 4 to φ 6.3, φ 10 x 7.7 : 1000hrs., φ 8 to φ 16 : 2000hrs.					
	ΔC/C	Within ±25% of the initial value					
	tanδ	≤ Twice the initial specified value					
	L.C.	≤ The initial specified value					

### Marking, Dimensions

(Unit : mm)



A pressure relief vent is attached to products over φD=8

D+0.5MAX.	L ±0.3	W ±0.2	H ±0.2	C ±0.2	R	P ±0.2
4	6.0	4.3	4.3	5.0	0.5 to 0.8	1.0
5	6.0	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	6.0	6.6	6.6	7.3	0.5 to 0.8	2.2
6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.2
8	10.2	8.3	8.3	9.0	0.7 to 1.0	3.2
10	7.7	10.3	10.3	11.0	1.1 to 1.4	4.6
10	10.2	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 ±0.5	12.8	12.8	13.5	1.1 to 1.4	4.6
16	16.5 ±0.5	16.3	16.3	17.3	1.8 to 2.1	7.0

### Size List, Impedance, Rated Ripple Current

μF	V	6.3		10		16		25		35		50				
		φD	L	φD	L	φD	L	φD	L	φD	L	φD	L			
4.7																
10								4 x 6.0	1.80	80	4 x 6.0	1.80	80			
15						4 x 6.0	1.80	80	5 x 6.0	0.76	150	5 x 6.0	0.76	150		
22				4 x 6.0	1.80	80	5 x 6.0	0.76	150	5 x 6.0	0.76	150	6.3 x 6.0	0.88	165	
27		4 x 6.0	1.80	80												
33				5 x 6.0	0.76	150										
47		5 x 6.0	0.76	150			6.3 x 6.0	0.44	230	6.3 x 6.0	0.44	230	6.3 x 7.7	0.68	195	
56		5 x 6.0	0.76	150			6.3 x 6.0	0.44	230	6.3 x 6.0	0.44	230	6.3 x 7.7	0.68	195	
68				6.3 x 6.0	0.44	230	6.3 x 6.0	0.44	230	6.3 x 6.0	0.44	230	6.3 x 7.7	0.34	280	
100		6.3 x 6.0	0.44	230			6.3 x 6.0	0.44	230	6.3 x 7.7	0.34	280	8 x 10.2	0.17	450	
150		6.3 x 6.0	0.44	230	6.3 x 6.0	0.44	230	6.3 x 7.7	0.34	280	8 x 10.2	0.17	450	10 x 10.2	0.21	450
220		6.3 x 6.0	0.44	230	6.3 x 7.7	0.34	280	6.3 x 7.7	0.34	280	8 x 10.2	0.17	450	10 x 10.2	0.17	450
330		6.3 x 7.7	0.34	280	8 x 10.2	0.17	450	8 x 10.2	0.17	450	8 x 10.2	0.17	450	10 x 10.2	0.09	670
390																
470		8 x 10.2	0.17	450	8 x 10.2	0.17	450	8 x 10.2	0.17	450	10 x 10.2	0.09	670	12.5 x 13.5	0.066	900
680		8 x 10.2	0.17	450	10 x 7.7	0.17	450									
1000		8 x 10.2	0.17	450	10 x 10.2	0.09	670									
1500		10 x 10.2	0.09	670				12.5 x 13.5	0.066	900						
2200				12.5 x 13.5	0.066	900					16 x 16.5	0.052	1250			
3300		12.5 x 13.5	0.066	900				16 x 16.5	0.052	1250						
4700				16 x 16.5	0.052	1250										
6800		16 x 16.5	0.052	1250												

→ Use next higher voltage product.

Case size ; φD x L (mm)  
10 x 7.7 ; CE-AXA series  
16 x 16.5 ; CE-AXT series

Rated ripple current  
mA r.m.s. (100kHz, 105°C)

Model No.

16 CE 470 AX

Series code  
Rated capacitance symbol  
Type code  
Rated voltage

10 CE 470 AXA

Series code  
Rated capacitance symbol  
Type code  
Rated voltage

10 CE 4700 AXT

Series code  
Rated capacitance symbol  
Type code  
Rated voltage

Impedance (Ω)  
MAX. at 100kHz, 20°C

## CE-KX Series Low Impedance

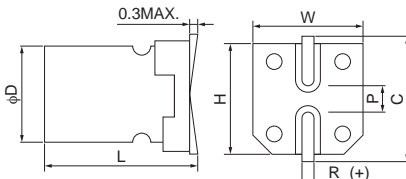
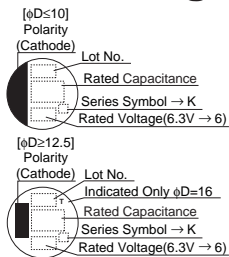


- This series has 10 to 20% less impedance with same package than CE-AX series.
- 105°C, 1000 to 2000hrs. Solvent proof (within 2 minutes).

### Specifications

Items		Specifications								
Rated voltage (V)		6.3	10	16	25	35	50	63	80	100
Category temperature range (°C)		-55 to +105								
Capacitance tolerance (%)		±20 (120Hz/20°C)								
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	φ4 to φ6.3	0.24	0.20	0.16	0.14	0.12	0.12	0.10	0.08	0.07
	φ8 to φ16	0.28	0.24	0.20	0.16	0.14	0.14	0.12	0.10	0.08
		When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.								
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3								
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	2	2	2	2	2	2	2	2
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	5	4	4	3	3	3	3	3	3
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ4 to φ6.3 : 1000hrs., φ8 to φ16 : 2000hrs.								
	ΔC/C	Within ±25% of the initial value								
	tanδ	≤ Twice the initial specified value								
	L.C.	≤ The initial specified value								

### Marking, Dimensions



(Unit : mm)

D <sub>±0.5MAX.</sub>	L <sub>±0.3</sub>	W <sub>±0.2</sub>	H <sub>±0.2</sub>	C <sub>±0.2</sub>	R	P <sub>±0.2</sub>
4	6.0	4.3	4.3	5.0	0.5 to 0.8	1.0
5	6.0	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	6.0	6.6	6.6	7.3	0.5 to 0.8	2.2
6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.2
8	10.2	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.2	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 ±0.5	12.8	12.8	13.5	1.1 to 1.4	4.6
16	16.5 ±0.5	16.3	16.3	17.3	1.8 to 2.1	7.0

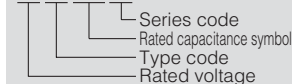
### Size List, Impedance, Rated Ripple Current

μF \ V	6.3	10	16	25	35	50	63	80	100
4.7					4x6.0   1.45   90	4x6.0   2.55   64	5x6.0   2.00   55	6.3x6.0   2.40   45	
10				4x6.0   1.45   90	5x6.0   0.70   170	6.3x6.0   0.52   215	6.3x6.0   1.00   90	6.3x7.7   2.00   65	
15			4x6.0   1.45   90	5x6.0   0.70   170	5x6.0   0.70   170				
22		4x6.0   1.45   90	5x6.0   0.70   170	5x6.0   0.70   170	5x6.0   0.70   170	6.3x6.0   0.52   215	6.3x7.7   0.80   135	8x10.2   0.90   140	8x10.2   0.90   140
27	4x6.0   1.45   90								
33	→	5x6.0   0.70   170	→	6.3x6.0   0.39   250	6.3x6.0   0.39   250	6.3x7.7   0.44   243	8x10.2   0.35   280	8x10.2   0.90   140	10x10.2   0.50   220
47	5x6.0   0.70   170	→	6.3x6.0   0.39   250	6.3x6.0   0.39   250	6.3x6.0   0.39   250	6.3x7.7   0.44   243	8x10.2   0.35   280	10x10.2   0.50   220	12.5x13.5   0.24   500
56	5x6.0   0.70   170			6.3x6.0   0.39   250	6.3x6.0   0.39   250				
68	→	6.3x6.0   0.39   250	6.3x6.0   0.39   250	6.3x6.0   0.39   250	6.3x7.7   0.30   300				
100	6.3x6.0   0.39   250	→	6.3x6.0   0.39   250	6.3x7.7   0.30   300	8x10.2   0.15   600	8x10.2   0.22   400	10x10.2   0.20   480	12.5x13.5   0.24   500	16x16.5   0.14   800
150	6.3x6.0   0.39   250	6.3x6.0   0.39   250	6.3x7.7   0.30   300	8x10.2   0.15   600	8x10.2   0.15   600			12.5x13.5   0.24   500	16x16.5   0.14   800
220	6.3x6.0   0.39   250	6.3x7.7   0.30   300	6.3x7.7   0.30   300	8x10.2   0.15   600	8x10.2   0.15   600				
330	6.3x7.7   0.30   300	8x10.2   0.15   600	8x10.2   0.15   600	8x10.2   0.15   600	8x10.2   0.15   600	10x10.2   0.13   585	12.5x13.5   0.14   800		
470	8x10.2   0.15   600	8x10.2   0.15   600	8x10.2   0.15   600	10x10.2   0.08   850	12.5x13.5   0.058   1150			16x16.5   0.14   800	
680	8x10.2   0.15   600	→	10x10.2   0.08   850	12.5x13.5   0.058   1150	12.5x13.5   0.058   1150				
1000	8x10.2   0.15   600	10x10.2   0.08   850		12.5x13.5   0.058   1150	16x16.5   0.035   1800	16x16.5   0.060   1610			
1500	10x10.2   0.08   850		12.5x13.5   0.058   1150		16x16.5   0.035   1800				
2200		12.5x13.5   0.058   1150		16x16.5   0.035   1800					
3300	12.5x13.5   0.058   1150		16x16.5   0.035   1800						
4700		16x16.5   0.035   1800							
6800	16x16.5   0.035   1800								

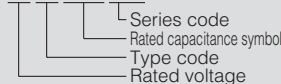
→ Use next higher voltage product.

■ Model No.

16 CE 470 KX



16 CE 3300 KXT



Case size ; φD x L (mm)  
16 x 16.5 ; CE-KXT series

Rated ripple current  
mAr.m.s (100kHz, 105°C)

Impedance (Ω)  
MAX. at 100kHz, 20°C

## CE-LS Series

Low Impedance

Long Life

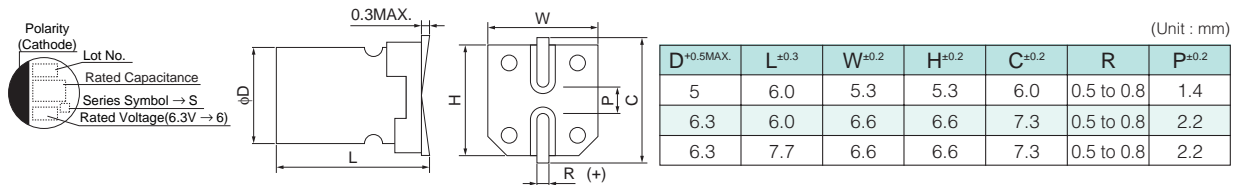


- 105°C, 3000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items	Specifications					
Rated voltage (V)	6.3	10	16	25	35	50
Category temperature range (°C)	-40 to +105					
Capacitance tolerance (%)	±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.28	0.24	0.22	0.16	0.13	0.12
Leakage current (L.C.) (μA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	4	3	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	10	7	5	3	3
Endurance 105°C 3000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±30% of the initial value				
	tanδ	≤ 3 times the initial specified value				
	L.C.	≤ The initial specified value				

### Marking, Dimensions



### Size List, Impedance, Rated Ripple Current

μF \ V	6.3	10	16	25	35	50
10					5 x 6.0   1.30   95	6.3 x 6.0   2.00   70
22			5 x 6.0   1.30   95	5 x 6.0   1.30   95	6.3 x 6.0   0.70   140	6.3 x 6.0   2.00   70
33		5 x 6.0   1.30   95		6.3 x 6.0   0.70   140		6.3 x 7.7   1.35   100
47	5 x 6.0   1.30   95		6.3 x 6.0   0.70   140	6.3 x 6.0   0.70   140	6.3 x 7.7   0.60   230	
100	6.3 x 6.0   0.70   140		6.3 x 6.0   0.70   140	6.3 x 7.7   0.60   230		
150		6.3 x 6.0   0.70   140	6.3 x 7.7   0.60   230			
220	6.3 x 7.7   0.60   230		6.3 x 7.7   0.60   230			
330	6.3 x 7.7   0.60   230					

Case size ; φD x L (mm)

Impedance (Ω)  
MAX. at 100kHz, 20°C

Rated ripple current  
mA r.m.s. (100kHz, 105°C)

Model No. 16 CE 220 LS

Series code  
Rated capacitance symbol  
Type code  
Rated voltage

## CE-LH Series Long Life



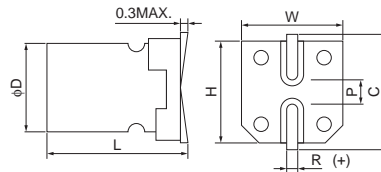
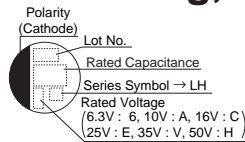
- 105°C, 5000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +105					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.32	0.24	0.20	0.16	0.13	0.12
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	4	3	2	2	2	2
	Z-40°C/Z20°C	10	7	5	3	3	3
Endurance 105°C, 5000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±30% of the initial value					
	tanδ	≤ 3 times the initial specified value					
	L.C.	≤ The initial specified value					

### Marking, Dimensions

(Unit : mm)



D <sup>+0.5MAX.</sup>	L <sup>+0.3</sup>	W <sup>+0.2</sup>	H <sup>+0.2</sup>	C <sup>+0.2</sup>	R	P <sup>+0.2</sup>
4	6.0	4.3	4.3	5.0	0.5 to 0.8	1.0
5	6.0	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	6.0	6.6	6.6	7.3	0.5 to 0.8	2.2
6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.2

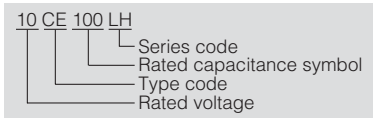
### Size List, Rated Ripple Current

μF \ V	6.3	10	16	25	35	50
0.1						4 x 6.0   1.0
0.22						4 x 6.0   2.6
0.33						4 x 6.0   3.2
0.47						4 x 6.0   3.8
1						4 x 6.0   6.2
2.2						4 x 6.0   11
3.3						4 x 6.0   14
4.7					4 x 6.0   15	5 x 6.0   19
10			4 x 6.0   18	5 x 6.0   25	5 x 6.0   25	6.3 x 6.0   30
22		5 x 6.0   30	5 x 6.0   30	6.3 x 6.0   42	6.3 x 6.0   42	6.3 x 7.7   49
33	5 x 6.0   35	5 x 6.0   35	6.3 x 6.0   48	6.3 x 6.0   48	6.3 x 7.7   57	
47	5 x 6.0   36	6.3 x 6.0   50	6.3 x 6.0   50	6.3 x 7.7   63		
100	6.3 x 6.0   60	6.3 x 7.7   81	6.3 x 7.7   81			
220	6.3 x 7.7   101					

Case size ; φD x L (mm)

Rated ripple current  
mA r.m.s. (120Hz, 105°C)

Model No.



Surface Mount Type  
CE-LH

## CE-LH Series 105°C Long Life Mid and High Voltage



- 160 to 400V •105°C, 5000hrs.
- Do not clean the capacitors using solvent.

### Specifications

Items		Specifications		
Rated voltage (V)		160	200	400
Category temperature range (°C)		-40 to +105		
Capacitance tolerance (%)		±20 (120Hz/20°C)		
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.20	0.20	0.25
Leakage current (L.C.) (μA/after 2min.) (MAX.)		CV ≤ 1000 ; 0.03 CV + 15 CV > 1000 ; 0.02 CV + 25		
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	3	3	6
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	6	6	10
Endurance 105°C, 5000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±30% of the initial value		
	tanδ	≤ 3 times the initial specified value		
	L.C.	≤ The initial specified value		

### Marking, Dimensions

[ φD ≤ 10 ]

[ φD ≥ 12.5 ]

\* (160V : 2C, 200V : 2D, 400V : 2G)

(Unit : mm)

D <sup>+0.5MAX.</sup>	L	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
8	10.5 <sup>±0.3</sup>	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.5 <sup>±0.3</sup>	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 <sup>±0.5</sup>	12.8	12.8	13.5	1.1 to 1.4	4.6
16	16.5 <sup>±0.5</sup>	16.3	16.3	17.3	1.8 to 2.1	7.0

### Size List, Rated Ripple Current

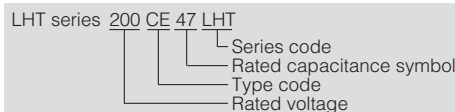
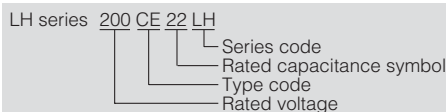
μF \ V	160		200		400	
	2.2					8 x 10.5
3.3					10 x 10.5	36
4.7					10 x 10.5	38
10	10 x 10.5	43			12.5 x 13.5	57
22	12.5 x 13.5	112	12.5 x 13.5	112	16 x 16.5	115
33	12.5 x 13.5	137	12.5 x 13.5	137		
47	16 x 16.5	180	16 x 16.5	180		
68	16 x 16.5	215	16 x 16.5	215		
82	16 x 16.5	235				

16 x 16.5 ; CE-LHT series

Case size ; φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 105°C)

#### Model No.



## CE-LX Series

Low Impedance  
Long Life



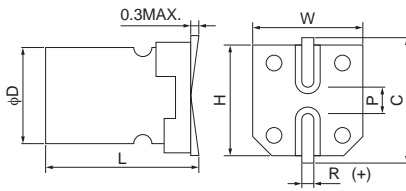
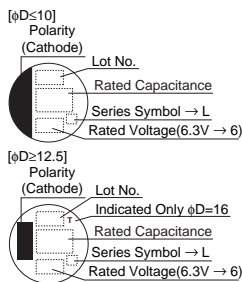
- 105°C, 2000 to 5000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-55 to +105					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	φ4 to φ6.3	0.26	0.20	0.16	0.14	0.12	0.12
	φ8 to φ16	0.28	0.24	0.22	0.16	0.14	0.14
When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.							
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z-40°C/Z20°C	3	3	3	3	3	3
	Z-55°C/Z20°C	4	4	4	3	3	3
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ4 to φ6.3 : 2000hrs., φ8 to φ16 : 5000hrs.					
	ΔC/C	Within ±30% of the initial value					
	tanδ	≤ 3 times the initial specified value					
	L.C.	≤ The initial specified value					

### Marking, Dimensions

(Unit : mm)



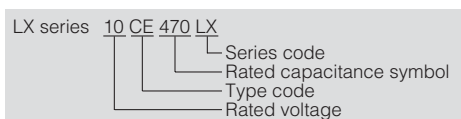
D <sup>+0.5MAX.</sup>	L <sup>±0.3</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
4	6.0	4.3	4.3	5.0	0.5 to 0.8	1.0
5	6.0	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	6.0	6.6	6.6	7.3	0.5 to 0.8	2.2
6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.2
8	10.2	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.2	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 ±0.5	12.8	12.8	13.5	1.1 to 1.4	4.6
16	16.5 ±0.5	16.3	16.3	17.3	1.8 to 2.1	7.0

### Size List, Impedance, Rated Ripple Current

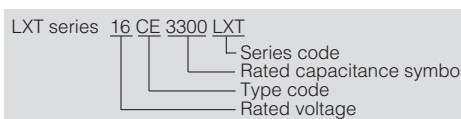
V	6.3	10	16	25	35	50
4.7					4 x 6.0   1.45   90	4 x 6.0   2.9   60
10				4 x 6.0   1.45   90	5 x 6.0   0.70   170	6.3 x 6.0   0.88   165
15			4 x 6.0   1.45   90	5 x 6.0   0.70   170	5 x 6.0   0.70   170	6.3 x 6.0   0.88   165
22		4 x 6.0   1.45   90	5 x 6.0   0.70   170	5 x 6.0   0.70   170	5 x 6.0   0.70   170	6.3 x 6.0   0.88   165
27	4 x 6.0   1.45   90	5 x 6.0   0.70   170	5 x 6.0   0.70   170	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 7.7   0.68   195
33	5 x 6.0   0.70   170	5 x 6.0   0.70   170	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 7.7   0.68   195
47	5 x 6.0   0.70   170	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 7.7   0.68   195
56	5 x 6.0   0.70   170	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 7.7   0.30   300	8 x 10.2   0.34   300
68	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 7.7   0.30   300	8 x 10.2   0.34   300
100	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 7.7   0.30   300	8 x 10.2   0.17   450	8 x 10.2   0.34   300
150	6.3 x 6.0   0.39   250	6.3 x 6.0   0.39   250	6.3 x 7.7   0.30   300	8 x 10.2   0.17   450	8 x 10.2   0.17   450	10 x 10.2   0.21   490
220	6.3 x 6.0   0.39   250	6.3 x 7.7   0.30   300	6.3 x 7.7   0.30   300	8 x 10.2   0.17   450	8 x 10.2   0.17   450	10 x 10.2   0.21   490
330	6.3 x 7.7   0.30   300	8 x 10.2   0.17   450	8 x 10.2   0.17   450	8 x 10.2   0.17   450	10 x 10.2   0.09   670	12.5 x 13.5   0.14   620
470	8 x 10.2   0.17   450	8 x 10.2   0.17   450	8 x 10.2   0.17   450	10 x 10.2   0.09   670	12.5 x 13.5   0.066   900	16 x 16.5   0.073   1610
680	8 x 10.2   0.17   450	10 x 10.2   0.09   670	10 x 10.2   0.09   670	12.5 x 13.5   0.066   900	12.5 x 13.5   0.066   900	16 x 16.5   0.073   1610
1000	8 x 10.2   0.17   450	10 x 10.2   0.09   670	12.5 x 13.5   0.066   900			
1500	10 x 10.2   0.09   670	12.5 x 13.5   0.066   900			16 x 16.5   0.035   1800	16 x 16.5   0.035   1800
2200	12.5 x 13.5   0.066   900				16 x 16.5   0.035   1800	
3300			16 x 16.5   0.035   1800			
4700		16 x 16.5   0.035   1800				
6800	16 x 16.5   0.035   1800					

16 x 16.5; CE-LXT series

Model No.



Case size ; φD x L (mm)



Rated ripple current mAr.m.s. (100kHz, 105°C)

Impedance (Ω) MAX. at 100kHz, 20°C

## CE-PC Series 125°C Long Life



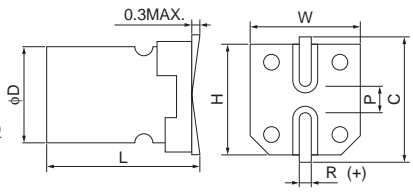
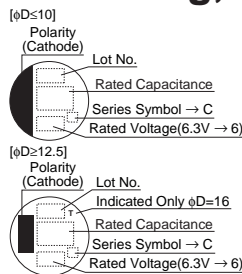
- 125°C, 1000 to 2000hrs. • 63V newly added.
- Solvent proof (within 2 minutes)

### Specifications

Items	Specifications							
Rated voltage (V)	6.3	10	16	25	35	50	63	100
Category temperature range (°C)	-40 to +125							
Capacitance tolerance (%)	±20 (120Hz/20°C)							
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.30	0.24	0.20	0.16	0.14	0.14	0.12	0.10
Leakage current (L.C.) (μA/after 2min.) (MAX.)	When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase. The greater value of either 0.01CV or 3							
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	4	3	2	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	8	6	4	3	3	3	3
Endurance 125°C	Test	6.3 to 50V 2000hrs. (φD=6.3 : 1000hrs.), 6.3 to 100V 1500hrs.						
rated voltage applied (With the rated ripple current)	ΔC/C	Within ±30% of the initial value						
	tanδ	≤ 3 times the initial specified value						
	L.C.	≤ The initial specified value						

### Marking, Dimensions

(Unit : mm)



A pressure relief vent is attached to products over φD=8

φD <sup>+0.5MAX.</sup>	L <sup>±0.3</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
6.3	6.0	6.6	6.6	7.3	0.5 to 0.8	2.2
6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.2
8	10.2	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.2	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 ±0.5	12.8	12.8	13.5	1.1 to 1.4	4.6
16	16.5 ±0.5	16.3	16.3	17.3	1.8 to 2.1	7.0

### Size List, E.S.R., Rated Ripple Current

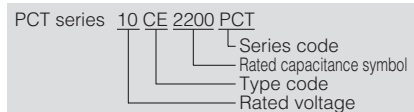
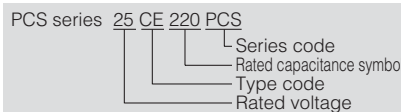
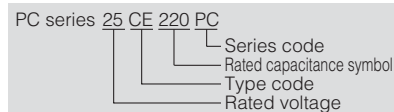
μF	V	6.3	10	16	25	35	50	63	100
1.0							6.3 x 6.0   3.5   45		
2.2							6.3 x 6.0   3.5   45		
3.3							6.3 x 6.0   3.5   45		
4.7						6.3 x 6.0   2.0   60	6.3 x 6.0   3.5   45		
10						6.3 x 6.0   1.6   70	6.3 x 6.0   2.8   50		8 x 10.2   1.0   70
22						6.3 x 6.0   1.6   70	6.3 x 7.7   2.0   80	8 x 10.2   1.0   100	8 x 10.2   1.0   70
33					6.3 x 6.0   1.6   70	6.3 x 7.7   0.9   110	6.3 x 7.7   2.0   80 8 x 10.2   0.7   140	8 x 10.2   1.0   100	10 x 10.2   0.80   115
47		6.3 x 6.0   1.6   70	6.3 x 6.0   1.6   70	6.3 x 7.7   0.9   110	6.3 x 7.7   0.9   110	6.3 x 7.7   0.9   110 8 x 10.2   0.4   160	8 x 10.2   0.7   140 10 x 10.2   0.5   240	8 x 10.2   1.0   100 10 x 10.2   0.50   150	12.5 x 13.5   0.33   350
100	6.3 x 6.0   1.6   70	6.3 x 7.7   0.9   110	8 x 10.2   0.4   160	6.3 x 7.7   0.9   110 8 x 10.2   0.4   160	8 x 10.2   0.4   160	10 x 10.2   0.3   220	12.5 x 13.5   0.23   490	10 x 10.2   0.50   150 12.5 x 13.5   0.25   350	16 x 16.5   0.24   500
220	6.3 x 7.7   0.9   110	6.3 x 7.7   0.9   110 8 x 10.2   0.4   160	8 x 10.2   0.4   160	8 x 10.2   0.4   160	8 x 10.2   0.4   160	10 x 10.2   0.3   220	12.5 x 13.5   0.23   490	12.5 x 13.5   0.25   350 16 x 16.5   0.18   500	
330	8 x 10.2   0.4   160	8 x 10.2   0.4   160	10 x 10.2   0.3   220	10 x 10.2   0.3   220	10 x 10.2   0.3   220	12.5 x 13.5   0.12   550	12.5 x 13.5   0.23   490 16 x 16.5   0.15   800	16 x 16.5   0.18   500	
470	8 x 10.2   0.4   160	10 x 10.2   0.3   220	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550 16 x 16.5   0.08   900	16 x 16.5   0.15   800	16 x 16.5   0.18   500	
680	10 x 10.2   0.3   220	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550	16 x 16.5   0.08   900	16 x 16.5   0.15   800		
1000	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550	16 x 16.5   0.08   900	16 x 16.5   0.08   900			
1500	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550	12.5 x 13.5   0.12   550	16 x 16.5   0.08   900	16 x 16.5   0.08   900				
2200	12.5 x 13.5   0.12   550	16 x 16.5   0.08   900	16 x 16.5   0.08   900						
3300	16 x 16.5   0.08   900	16 x 16.5   0.08   900							
4700	16 x 16.5   0.08   900								

Upper: PCS series Case size ; φD x L (mm)  
Lower: PC series 16 x 16.5 ; CE-PCT series

E.S.R. (Ω)  
MAX. at 100kHz, 20°C

Rated ripple current  
mAr.m.s. (100kHz, 125°C)

#### Model No.





## CE-PH Series 125°C Low ESR Hi-Ripple, Hi-Capacitance, Long life



- 125°C, 2000hrs. • Suitable for Automotive Application
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications		
Rated voltage (V)		16	25	35
Category temperature range (°C)		-40 to +125		
Capacitance tolerance (%)		±20 (120Hz/20°C)		
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.20	0.16	0.14
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3		
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	2	2	2
	Z-40°C/Z20°C	4	3	3
Endurance 125°C, 2000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ± 30% of the initial value		
	tanδ	≤ 3 times the initial specified value		
	L.C.	≤ The initial specified value		

### Marking, Dimensions

**φD ≤ 10**

**φD ≥ 12.5**

(Unit : mm)

D <sup>+0.5MAX.</sup>	L	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
8	10.5 <sup>±0.3</sup>	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.5 <sup>±0.3</sup>	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 <sup>±0.5</sup>	12.8	12.8	13.5	1.1 to 1.4	4.6

\* (16V:C, 25V:E, 35V:V)

### Size List, E.S.R., Rated Ripple Current

V Items μF	16 (C)			25 (E)			35 (V)		
	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 125°C/100kHz	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 125°C/100kHz	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 125°C/100kHz
160							8 x 10.5	0.18	300
270				8 x 10.5	0.18	300			
300							10 x 10.5	0.11	500
390	8 x 10.5	0.18	300						
470				10 x 10.5	0.11	500			
620							12.5 x 13.5	0.08	1000
680	10 x 10.5	0.11	500						
910				12.5 x 13.5	0.08	1000			
1500	12.5 x 13.5	0.08	1000						

Model No. **16 CE 680 PH**

- 16: Rated voltage
- CE: Series code
- 680: Rated capacitance symbol
- PH: Type code

## CE-NP Series

Bi-polar

5.4mm Height



- 85°C, 2000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items	Specifications					
Rated voltage (V)	6.3	10	16	25	35	50
Category temperature range (°C)	-40 to +85					
Capacitance tolerance (%)	±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.26	0.22	0.20	0.20	0.20	0.18
Leakage current (L.C.) (μA/after 1min.) (MAX.)	0.03CV + 6					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	4	3	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	8	6	4	4	3
Endurance 500hrs.x4 (alternately) 85°C, rated voltage applied (With the rated ripple current)	ΔC/C	Within ± 25% of the initial value				
	tanδ	≤ Twice the initial specified value				
	L.C.	≤ The initial specified value				

### Marking, Dimensions

(Unit : mm)						
D <sup>+0.5MAX.</sup>	L <sup>+0.1 -0.2</sup>	W <sup>±0.2</sup>	H <sup>±0.2</sup>	C <sup>±0.2</sup>	R	P <sup>±0.2</sup>
4	5.4	4.3	4.3	5.0	0.5 to 0.8	1.0
5	5.4	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	5.4	6.6	6.6	7.3	0.5 to 0.8	2.2

### Size List, Rated Ripple Current

μF \ V	6.3	10	16	25	35	50
0.10						4 1.0
0.22						4 2.3
0.33						4 3.5
0.47						4 5.0
1.0						4 10
2.2					4 8.4	5 15
3.3				4 10	5 17	5 18
4.7			4 12	5 19	5 20	6.3 23
10		4 17	5 25	6.3 28	6.3 30	
22	5 31	6.3 35	6.3 39			
33	6.3 39	6.3 43	6.3 57			
47	6.3 47					

Model No. 16 CE 10 NP  
 Series code  
 Rated capacitance symbol  
 Type code  
 Rated voltage

Case size ; φD (mm)      Rated ripple current  
mAr.m.s. (120Hz, 85°C)

## CE-FN Series

Bi-polar 105°C

5.4mm Height



- 105°C, 1000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items	Specifications							
Rated voltage (V)	6.3	10	16	25	35	50	63	
Category temperature range (°C)	-55 to +105							
Capacitance tolerance (%)	±20 (120Hz/20°C)							
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.24	0.22	0.20	0.20	0.20	0.18	0.16	
Leakage current (L.C.) (μA/after 1min.) (MAX.)	0.03CV+6							
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	3	2	2	2	2	2
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	8	6	4	4	3	3	3
Endurance 500hrs.x2 (alternately) 105°C, rated voltage applied (With the rated ripple current)	ΔC/C	Within ± 25% of the initial value						
	tanδ	≤ Twice the initial specified value						
	L.C.	≤ The initial specified value						

### Marking, Dimensions

(Unit : mm)

D <sup>+0.5MAX.</sup>	L <sup>+0.1 -0.2</sup>	W <sup>+0.2</sup>	H <sup>+0.2</sup>	C <sup>+0.2</sup>	R	P <sup>+0.2</sup>
4	5.4	4.3	4.3	5.0	0.5 to 0.8	1.0
5	5.4	5.3	5.3	6.0	0.5 to 0.8	1.4
6.3	5.4	6.6	6.6	7.3	0.5 to 0.8	2.2

### Size List, Rated Ripple Current

μF \ V	6.3	10	16	25	35	50	63
0.10						4	0.7
0.22						4	1.6
0.33						4	2.4
0.47						4	3.5
1.0						4	7
2.2					4	5.9	5
3.3				4	7	5	12
4.7			4	8	5	13	5
10		4	12	5	17	6.3	20
22	5	22	6.3	25	6.3	27	6.3
33	6.3	27	6.3	30	6.3	40	6.3
47	6.3	33					

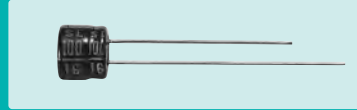
Model No. 16 CE 10 FN  
 Series code  
 Rated capacitance symbol  
 Type code  
 Rated voltage

Case size ; φD (mm)

Rated ripple current  
mAr.m.s. (120Hz, 105°C)

## ME-UW Series

Standard  
5mm Height

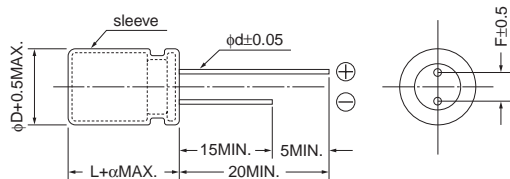


- Solvent proof (within 2 minutes)

### Specifications

Items	Specifications							
Rated voltage (V)	4	6.3	10	16	25	35	50	
Category temperature range (°C)	-40 to +85							
Capacitance tolerance (%)	±20 (120Hz/20°C)							
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.35	0.24	0.20	0.16	0.14	0.12	0.10	
Leakage current (L.C.) (μA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3							
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	7	4	3	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	15	10	8	6	4	4	4
Endurance 85°C, 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value						
	tanδ	≤ Twice the initial specified value						
	L.C.	≤ The initial specified value						

### Dimensions



α : UW α=1.0 UWX α=1.3

(Unit : mm)

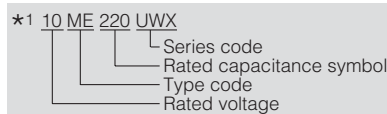
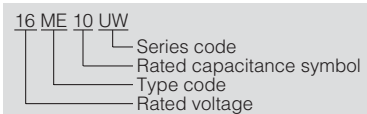
φD	3	4	5	6.3
F	1.0	1.5	2.0	2.5
φd	0.40	0.45	0.45	0.45

### Size List, Rated Ripple Current

V	4		6.3		10		16		25		35		50	
2.2											3 x 5	8.4		
3.3									3 x 5	10			4 x 5	18
4.7							3 x 5	12			4 x 5	20	5 x 5	23
10			3 x 5	13			4 x 5	25	5 x 5	28	5 x 5	30	6.3 x 5	34
22			4 x 5	31	5 x 5	35	5 x 5	39	6.3 x 5	52	6.3 x 5	54	6.3 x 5 *1	54
33	4 x 5	26	5 x 5	39	5 x 5	43	6.3 x 5	57	6.3 x 5	63	6.3 x 5 *1	68		
47	4 x 5	34	5 x 5	47	6.3 x 5	59	6.3 x 5	68	6.3 x 5 *1	73	6.3 x 5 *1	73		
100	5 x 5	61	6.3 x 5	71	6.3 x 5	76	6.3 x 5	86						
220	6.3 x 5	82	6.3 x 5 *1	90	6.3 x 5 *1	90								
330	6.3 x 5 *1	85	6.3 x 5 *1	92										

Case size ; φD x L (mm)      \*1 UWX Type  
Rated ripple current  
mAr.m.s. (120Hz, 85°C)

#### Model No.



## ME-UWA Series

Miniature

5mm Height

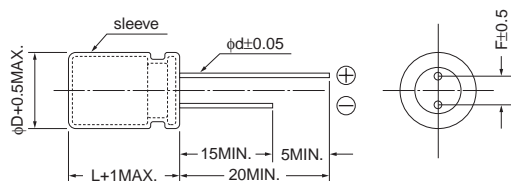


- This series is one size smaller than UW series. 5mm in height with  $\phi 3$ - $\phi 5$ mm in diameter.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +85					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.24	0.20	0.16	0.14	0.12	0.10
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	4	3	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	10	8	6	4	4	4
Endurance 85°C, 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value					
	tanδ	≤ Twice the initial specified value					
	L.C.	≤ The initial specified value					

### Dimensions



(Unit : mm)

φD	3	4	5
F	1.0	1.5	2.0
φd	0.40	0.45	0.45

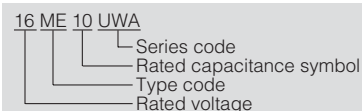
### Size List, Rated Ripple Current

V	6.3		10		16		25		35		50	
0.10											3 x 5	1.0
0.22											3 x 5	2.3
0.33											3 x 5	3.5
0.47											3 x 5	5.0
1.0											3 x 5	10
2.2											3 x 5	15
3.3									3 x 5	17		
4.7							3 x 5	19			4 x 5	18
10			3 x 5	17	3 x 5	18	4 x 5	24	4 x 5	24	5 x 5	30
22	3 x 5	21	4 x 5	30	4 x 5	30	5 x 5	38	5 x 5	39		
33	4 x 5	34	4 x 5	34	5 x 5	44	5 x 5	46				
47	4 x 5	40	5 x 5	47	5 x 5	52						
100	5 x 5	47										

Case size ; φD x L (mm)

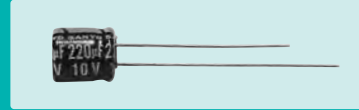
Rated ripple current  
mAr.m.s. (120Hz, 85°C)

Model No.



## ME-SWB Series

Standard  
7mm Height

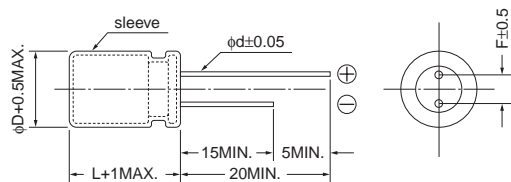


- Solvent proof (within 3 minutes)

### Specifications

Items	Specifications								
Rated voltage (V)	4	6.3	10	16	25	35	50	63	
Category temperature range (°C)	-40 to +85								
Capacitance tolerance (%)	±20 (120Hz/20°C)								
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.35	0.24	0.20	0.16	0.14	0.12	0.10	0.10	
Leakage current (L.C.) (μA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3								
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	7	4	3	2	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	15	10	7	6	4	4	4	4
Endurance 85°C, 2000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value							
	tanδ	≤ Twice the initial specified value							
	L.C.	≤ The initial specified value							

### Dimensions



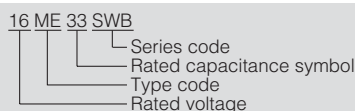
(Unit : mm)

φD	4	5	6.3
F	1.5	2.0	2.5
φd	0.45	0.45	0.45

### Size List, Rated Ripple Current

μF \ V	4	6.3	10	16	25	35	50	63
0.10							4 x 7   1	4 x 7   1.2
0.22							4 x 7   2.3	4 x 7   2.9
0.33							4 x 7   3.5	4 x 7   4.4
0.47							4 x 7   5	4 x 7   5
1.0							4 x 7   10	4 x 7   10
2.2							4 x 7   15	4 x 7   17
3.3					4 x 7   16	4 x 7   17	4 x 7   18	4 x 7   21
4.7					4 x 7   19	4 x 7   20	4 x 7   23	5 x 7   26
10				4 x 7   25	4 x 7   28	5 x 7   30	5 x 7   34	6.3 x 7   43
22		4 x 7   31	4 x 7   35	4 x 7   39	5 x 7   52	6.3 x 7   54	6.3 x 7   60	6.3 x 7   65
33	4 x 7   26	4 x 7   39	4 x 7   43	5 x 7   57	6.3 x 7   63	6.3 x 7   65	6.3 x 7   70	
47	4 x 7   34	4 x 7   47	5 x 7   59	5 x 7   68	6.3 x 7   70	6.3 x 7   75	6.3 x 7   80	
100	5 x 7   61	5 x 7   71	6.3 x 7   80	6.3 x 7   91	6.3 x 7   100	6.3 x 7   105		
150				6.3 x 7   105				
220	6.3 x 7   82	6.3 x 7   103	6.3 x 7   110	6.3 x 7   110				
330	6.3 x 7   100	6.3 x 7   110						
470	6.3 x 7   110							

Model No.

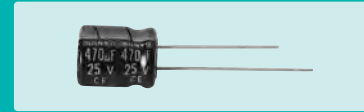


Case size ; φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 85°C)

## ME-HC Series

Standard

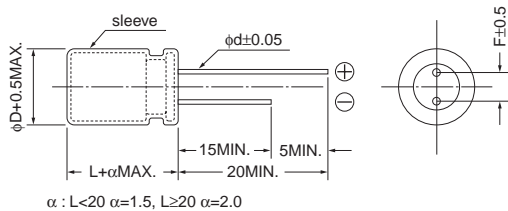


- Solvent proof (within 5 minutes)

### Specifications

Items	Specifications							
Rated voltage (V)	6.3	10	16	25	35	50	63	100
Category temperature range (°C)	-40 to +85							
Capacitance tolerance (%)	±20 (120Hz/20°C)							
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.10
	When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.							
Leakage current (L.C.) (μA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3							
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	5	4	3	2	2	2	2
	Z-40°C/Z20°C	12	10	8	6	4	4	4
Endurance 85°C, 2000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value						
	tanδ	≤ Twice the initial specified value						
	L.C.	≤ The initial specified value						

### Dimensions



(Unit : mm)

φD	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8

A pressure relief vent is attached to products over φD=6.3

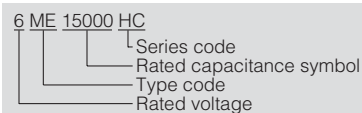
### Size List, Rated Ripple Current

μF	V	6.3	10	16	25	35	50	63	100							
0.10							5 x 11	1.0	5 x 11	1.2	5 x 11	2.1				
0.22							5 x 11	2.5	5 x 11	3.0	5 x 11	4.7				
0.33							5 x 11	4.0	5 x 11	4.8	5 x 11	7.0				
0.47							5 x 11	5.0	5 x 11	5.0	5 x 11	10				
1.0							5 x 11	10	5 x 11	10	5 x 11	21				
2.2							5 x 11	20	5 x 11	20	5 x 11	30				
3.3							5 x 11	28	5 x 11	28	5 x 11	40				
4.7					5 x 11	25	5 x 11	38	5 x 11	40	5 x 11	50				
10				5 x 11	28	5 x 11	40	5 x 11	50	5 x 11	60	6.3 x 11	70			
22			5 x 11	38	5 x 11	50	5 x 11	75	5 x 11	90	5 x 11	105	8 x 11.5	120		
33	5 x 11	50	5 x 11	58	5 x 11	60	5 x 11	80	5 x 11	90	5 x 11	110	6.3 x 11	130	8 x 12.5	145
47	5 x 11	60	5 x 11	70	5 x 11	85	5 x 11	90	5 x 11	125	6.3 x 11	135	6.3 x 11	160	10 x 12.5	180
100	5 x 11	120	5 x 11	125	5 x 11	165	6.3 x 11	180	6.3 x 11	200	8 x 11.5	250	8 x 12.5	280	10 x 20	350
220	5 x 11	210	5 x 11	210	6.3 x 11	260	8 x 11.5	320	8 x 11.5	320	10 x 12.5	410	10 x 16	450	12.5 x 25	550
330	6.3 x 11	260	6.3 x 11	295	8 x 11.5	360	8 x 11.5	380	10 x 12.5	440	10 x 16	580	10 x 20	600	16 x 25	750
470	6.3 x 11	330	6.3 x 11	330	8 x 11.5	380	10 x 12.5	540	10 x 16	585	10 x 20	750	12.5 x 20	800	16 x 31.5	950
1000	8 x 11.5	420	10 x 12.5	620	10 x 16	740	10 x 20	940	12.5 x 20	1000	12.5 x 25	1150	16 x 25	1250		
2200	10 x 16	890	10 x 20	1000	12.5 x 20	1150	12.5 x 25	1350	16 x 25	1500	16 x 31.5	1700				
3300	10 x 20	1080	12.5 x 20	1300	12.5 x 25	1500	16 x 25	1600	16 x 35.5	1750	18 x 35.5	1850				
4700	12.5 x 20	1400	12.5 x 25	1550	16 x 25	1750	16 x 31.5	1900	18 x 35.5	2000						
6800	12.5 x 25	1600	16 x 25	1800	16 x 31.5	1900	18 x 35.5	2000								
10000	16 x 25	1750	16 x 31.5	1900	18 x 35.5	2000										
15000	16 x 35.5	1900	18 x 35.5	2000												

Case size ; φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 85°C)

Model No.



## ME-HPC·HPD Series

Miniature, Mid. and High Voltage  
Low Profile, Mid. and High Voltage

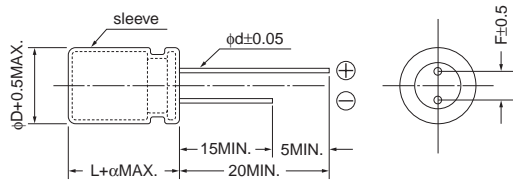


•Do not clean the capacitors using solvent.

### Specifications

Items	Specifications						
Rated voltage (V)	160	200	250	350	400	450	
Category temperature range (°C)	-40 to +85			-25 to +85			
Capacitance tolerance (%)	±20 (120Hz/20°C)						
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.20	0.20	0.20	0.25	0.25	0.25	
Leakage current (L.C.) (μA/after 2min.) (MAX.)	CV≤1000	0.03CV+15					
	CV>1000	0.02CV+25					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	3	3	3	4	6	12
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	6	6	6	—	—	—
Endurance 85°C, 2000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±20% of the initial value					
	tanδ	≤ Twice the initial specified value					
	L.C.	≤ The initial specified value					

### Dimensions



$\alpha : L < 20 \alpha = 1.5, L \geq 20 \alpha = 2.0$

A pressure relief vent is attached to products over  $\phi D = 6.3$

(Unit : mm)

	5	6.3	8	10	12.5	16	18
$\phi D$	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
$\phi d$	0.5	0.5	0.6	0.6	0.6	0.8	0.8

### Size List, Rated Ripple Current

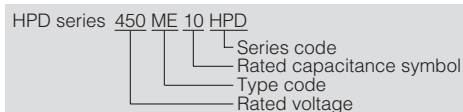
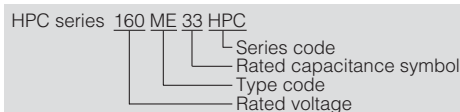
$\mu F$	160		200		250		350		400		450	
0.47	5 x 11	10	5 x 11	11	5 x 11	12	6.3 x 11	14	6.3 x 11	14		
1.0	5 x 11	21	5 x 11	23	5 x 11	25	6.3 x 11	29	8 x 11.5	29	8 x 12.5	26
2.2	6.3 x 11	31	6.3 x 11	34	6.3 x 11	35	8 x 11.5	40	8 x 11.5	40	10 x 16	40
3.3	6.3 x 11	40	6.3 x 11	46	8 x 11.5	48	8 x 12.5	52	10 x 12.5	52	10 x 20	52
4.7	6.3 x 11	55	8 x 11.5	57	8 x 11.5	59	10 x 12.5	67	10 x 16	67	12.5 x 20	67
10	8 x 11.5	90	8 x 12.5	92	10 x 12.5	94	10 x 16	100	10 x 20	100	12.5 x 25 16 x 21	100
22	10 x 12.5	153	10 x 16	160	10 x 20	170	12.5 x 20	175	12.5 x 25 16 x 21	180	16 x 25 18 x 21	180
33	10 x 20	195	10 x 20	210	12.5 x 20	220	12.5 x 25 16 x 21	225	16 x 25 18 x 21	230	16 x 30 18 x 25	220
47	12.5 x 20	245	12.5 x 20	250	12.5 x 25 16 x 21	260	16 x 25 18 x 21	260	16 x 30 18 x 25	270	18 x 35.5	245
68	12.5 x 20	310	12.5 x 25 16 x 21	325	16 x 25 18 x 21	335	16 x 35.5 18 x 25	340	16 x 35.5 18 x 30.5	345		
82	12.5 x 25 16 x 21	380	16 x 21	390	16 x 30 18 x 25	400	18 x 30.5	405	18 x 35.5	420		
100	12.5 x 25 16 x 21	410	16 x 25 18 x 21	430	16 x 30 18 x 25	432	18 x 35.5	440				
150	16 x 30 18 x 25	550	16 x 35.5 18 x 30.5	575	18 x 35.5	588						
220	16 x 35.5 18 x 30.5	745	18 x 35.5	760								

Upper ; HPC series  
Lower ; HPD series  
0.47μF to 4.7μF ; HPC series

Case size ;  $\phi D \times L$  (mm)

Rated ripple current  
mAr.m.s. (120Hz, 85°C)

Model No.





## ME-UZ·SZ Series

5mm Height, Wide Temperature Range

7mm Height, Wide Temperature Range

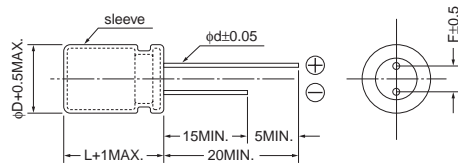


- ME-UZ ; 105°C, 1000hrs. Solvent proof (within 2 minutes)
- ME-SZ ; 105°C, 1000hrs. Solvent proof (within 3 minutes)

## Specifications

Items	Specifications					
Rated voltage (V)	6.3	10	16	25	35	50
Category temperature range (°C)	-55 to +105					
Capacitance tolerance (%)	±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.24	0.20	0.16	0.14	0.12	0.10
Leakage current (L.C.) (μA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	2	2	2	2
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	5	4	4	3	3
Endurance 105°C, 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value				
	tanδ	≤ Twice the initial specified value				
	L.C.	≤ The initial specified value				

## Dimensions



(Unit : mm)

φD	4	5	6.3
F	1.5	2.0	2.5
φd	0.45	0.45	0.45

## Size List, Impedance, Rated Ripple Current

### UZ series

μF	V	6.3			10			16			25			35			50					
		0.10																	4 x 5	30	10	
0.22																		4 x 5	16	10		
0.33																		4 x 5	13	15		
0.47																		4 x 5	12	20		
1.0																		4 x 5	11	25		
2.2																		4 x 5	9.8	30		
3.3																		4 x 5	8.0	35		
4.7																		5 x 5	3.8	50		
10								4 x 5	5.6	45	5 x 5	2.6	65	6.3 x 5	1.6	100	6.3 x 5	2.0	70	6.3 x 5	2.0	70
22		4 x 5	5.6	45	5 x 5	2.6	65	5 x 5	2.6	65	6.3 x 5	1.6	100	6.3 x 5	1.6	100	6.3 x 5	2.0	70	6.3 x 5	2.0	70
33		5 x 5	2.6	65	5 x 5	2.6	65	6.3 x 5	1.6	100	6.3 x 5	1.6	100	6.3 x 5	1.6	100	6.3 x 5	2.0	70			
47		5 x 5	2.6	65	6.3 x 5	1.6	100	6.3 x 5	1.6	100	6.3 x 5	1.6	100	6.3 x 5	1.6	100	6.3 x 5	2.0	70			
100		6.3 x 5	1.6	100	6.3 x 5	1.6	100	6.3 x 5	1.6	100	6.3 x 5	1.6	100	6.3 x 5	1.6	100	6.3 x 5	2.0	70			
220		6.3 x 5	1.6	100																		

### SZ series

μF	V	6.3			10			16			25			35			50					
		0.10																	4 x 7	30	10	
0.22																		4 x 7	16	10		
0.33																		4 x 7	13	15		
0.47																		4 x 7	12	20		
1.0																		4 x 7	10	30		
2.2																		4 x 7	7.8	35		
3.3																		4 x 7	6.2	40		
4.7																		5 x 7	3.1	70		
10								4 x 7	4.2	50	5 x 7	2.0	85	5 x 7	3.1	70	6.3 x 7	1.6	100	6.3 x 7	1.6	100
22		4 x 7	4.2	50	5 x 7	2.0	85	5 x 7	2.0	85	6.3 x 7	1.2	120	6.3 x 7	1.6	100	6.3 x 7	1.6	100	6.3 x 7	1.6	100
33		5 x 7	2.0	85	5 x 7	2.0	85	6.3 x 7	1.2	120	6.3 x 7	1.2	120	6.3 x 7	1.6	100	6.3 x 7	1.6	100	6.3 x 7	1.6	100
47		5 x 7	2.0	85	6.3 x 7	1.2	120	6.3 x 7	1.2	120	6.3 x 7	1.2	120	6.3 x 7	1.6	100	6.3 x 7	1.6	100	6.3 x 7	1.6	100
100		6.3 x 7	1.2	120	6.3 x 7	1.2	120	6.3 x 7	1.2	120	6.3 x 7	1.2	120	6.3 x 7	1.6	100	6.3 x 7	1.6	100			
220		6.3 x 7	1.2	120	6.3 x 7	1.2	120	6.3 x 7	1.2	120												
330		6.3 x 7	1.2	120																		

### Model No.

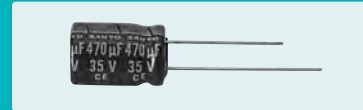
UZ series 16 ME 10 UZ  
 Series code  
 Rated capacitance symbol  
 Type code  
 Rated voltage

SZ series 16 ME 10 SZ  
 Series code  
 Rated capacitance symbol  
 Type code  
 Rated voltage

Case size ; φD x L (mm)  
 Rated ripple current mAr.m.s. (100kHz, 105°C)  
 Impedance (Ω) MAX. at 100kHz, 20°C

## ME-CZ Series

Temperature of Wide Range  
Smaller in Size Miniature Standard

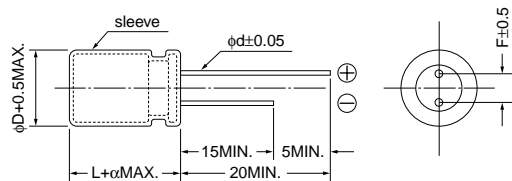


- 105°C, 1000 to 3000hrs.
- Solvent proof (within 5 minutes)

### Specifications

Items	Specifications									
Rated voltage (V)	6.3	10	16	25	35	50	63	100		
Category temperature range (°C)	-55 to +105									
Capacitance tolerance (%)	±20 (120Hz/20°C)									
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.10		
	When rated capacitance exceeds 1000µF, add 0.02 to the value above for each 1000µF increase.									
Leakage current (L.C.) (µA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3									
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	4	4	3	3	2	2	2	2	
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	10	8	6	5	4	3	3	3	
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ5 to φ8 : 1000hrs., φ10 : 2000hrs., φ12.5 to φ18 : 3000hrs.								
	ΔC/C	Within ±25% of the initial value								
	tanδ	≤ Twice the initial specified value								
	L.C.	≤ The initial specified value								

### Dimensions



α : L<20 α=1.5, L≥20 α=2.0

A pressure relief vent is attached to products over φD=6.3

(Unit : mm)

φD	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8

### Size List, Impedance, Rated Ripple Current

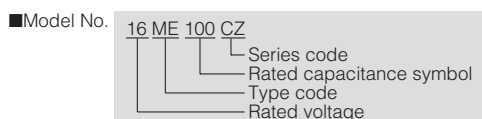
Case size φD x L (mm)	Items	6.3			10		
		Capacitance (µF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)	Capacitance (µF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)
5 x 11		220	1.4	160	100	1.4	150
6.3 x 11		330	0.58	240	220	0.58	240
6.3 x 11		470	0.55	250	330	0.55	250
8 x 11.5		1000	0.26	450	470	0.39	370
10 x 12.5					1000	0.16	560
10 x 16		2200	0.12	760			
10 x 20		3300	0.10	900	2200	0.10	900
12.5 x 20		4700	0.072	1100	3300	0.074	1100
12.5 x 25		6800	0.054	1420	4700	0.054	1420
16 x 25		10000	0.043	1700	6800	0.043	1700
16 x 31.5					10000	0.035	1950
16 x 35.5		15000	0.032	2100			
18 x 35.5					15000	0.028	2400

## Size List, Impedance, Rated Ripple Current

Case size φD x L (mm)	Items	16			25		
		Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)	Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)
		(μF)	(20°C/100kHz)	(105°C/100kHz)	(μF)	(20°C/100kHz)	(105°C/100kHz)
5 x 11		100	1.4	150	47	1.4	150
6.3 x 11		220	0.55	240	100	0.60	240
8 x 11.5		330	0.35	370	220	0.39	370
8 x 11.5		470	0.28	450	330	0.34	400
10 x 12.5					470	0.17	560
10 x 16		1000	0.13	760			
10 x 20					1000	0.10	900
12.5 x 20		2200	0.075	1100			
12.5 x 25		3300	0.054	1320	2200	0.062	1320
16 x 25		4700	0.043	1600	3300	0.043	1600
16 x 31.5		6800	0.035	1900	4700	0.035	1900
18 x 35.5		10000	0.028	2300	6800	0.028	2200

Case size φD x L (mm)	Items	35			50		
		Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)	Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)
		(μF)	(20°C/100kHz)	(105°C/100kHz)	(μF)	(20°C/100kHz)	(105°C/100kHz)
5 x 11				0.10	30	10	
5 x 11				0.22	20	10	
5 x 11				0.33	15	10	
5 x 11				0.47	10	20	
5 x 11				1.0	7.0	30	
5 x 11				2.2	5.5	40	
5 x 11				3.3	4.0	50	
5 x 11				4.7	2.8	80	
5 x 11				10	2.3	90	
5 x 11	33	2.1	120	22	2.2	110	
5 x 11	47	2.1	140	33	2.1	120	
6.3 x 11	100	1.1	180	47	1.1	180	
8 x 11.5	220	0.46	360	100	0.55	310	
10 x 12.5	330	0.26	500	220	0.30	500	
10 x 16	470	0.18	650	330	0.20	650	
10 x 20				470	0.13	800	
12.5 x 20	1000	0.11	900				
12.5 x 25				1000	0.10	1100	
16 x 25	2200	0.056	1400				
16 x 31.5				2200	0.055	1650	
16 x 35.5	3300	0.038	1800				
18 x 35.5	4700	0.035	2000	3300	0.035	2000	

Case size φD x L (mm)	Items	63			100		
		Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)	Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)
		(μF)	(20°C/100kHz)	(105°C/100kHz)	(μF)	(20°C/100kHz)	(105°C/100kHz)
5 x 11		0.47	15	15	0.47	20	15
5 x 11		1.0	10.5	30	1.0	14	30
5 x 11		2.2	8.3	42	2.2	11	42
5 x 11		3.3	6.0	58	3.3	8.0	58
5 x 11		4.7	4.2	64	4.7	5.6	64
5 x 11		10	2.8	90			
5 x 11		22	2.4	140			
6.3 x 11		33	1.4	200	10	1.7	108
6.3 x 11		47	1.3	240			
8 x 11.5					22	0.83	235
8 x 12.5		100	0.60	300	33	0.60	300
10 x 12.5					47	0.39	330
10 x 16		220	0.22	520			
10 x 20		330	0.17	765	100	0.24	450
12.5 x 20		470	0.14	960			
12.5 x 25					220	0.15	700
16 x 25		1000	0.065	1100	330	0.090	950
16 x 31.5					470	0.085	1100



## ME-UAX·SAX Series

Low Impedance

5mm Height (UAX), 7mm Height (SAX)

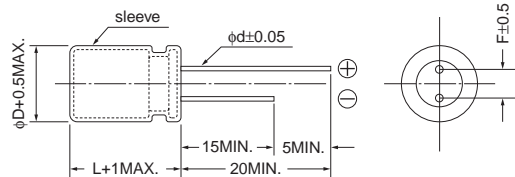


- ME-UAX ; 105°C, 1000hrs. Solvent proof (within 2 minutes)
- ME-SAX ; 105°C, 1000hrs. Solvent proof (within 3 minutes)

### Specifications

Items	Specifications				
Rated voltage (V)	6.3	10	16	25	35
Category temperature range (°C)	-55 to +105				
Capacitance tolerance (%)	±20 (120Hz/20°C)				
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.24	0.20	0.16	0.14	0.12
Leakage current (L.C.) (μA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3				
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	2	2	2
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	5	4	4	3
Endurance 105°C, 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ± 25% of the initial value			
	tanδ	≤ Twice the initial specified value			
	L.C.	≤ The initial specified value			

### Dimensions



(Unit : mm)

φD	4	5	6.3
F	1.5	2.0	2.5
φd	0.45	0.45	0.45

### Size List, Impedance, Rated Ripple Current

#### UAX series

μF \ V	6.3				10				16				25				35								
4.7																	4 x 5	2.20	80	4 x 5	2.20	80			
10																	5 x 5	0.76	150	5 x 5	0.76	150			
15									4 x 5	2.20	80	5 x 5	0.76	150	5 x 5	0.76	150	5 x 5	0.76	150	5 x 5	0.76	150		
22					4 x 5	2.20	80				5 x 5	0.76	150	5 x 5	0.76	150	5 x 5	0.76	150	5 x 5	0.76	150			
27	4 x 5	2.20	80																						
33					5 x 5	0.76	150							6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230
47	5 x 5	0.76	150							6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	
56	5 x 5	0.76	150										6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	
68					6.3 x 5	0.44	230				6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230
100	6.3 x 5	0.44	230							6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	
120											6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230	6.3 x 5	0.44	230
130					6.3 x 5	0.44	230																		
150	6.3 x 5	0.44	230																						
220	6.3 x 5	0.44	230																						

#### SAX series

μF \ V	6.3				10				16				25				35								
4.7																	4 x 7	1.15	90	4 x 7	1.15	90			
10																	5 x 7	0.49	160	5 x 7	0.49	160			
15									4 x 7	1.15	90	5 x 7	0.49	160	5 x 7	0.49	160	6.3 x 7	0.29	280	6.3 x 7	0.29	280		
22					4 x 7	1.15	90				5 x 7	0.49	160	5 x 7	0.49	160	6.3 x 7	0.29	280	6.3 x 7	0.29	280			
33					5 x 7	0.49	160							6.3 x 7	0.24	280	6.3 x 7	0.24	280	6.3 x 7	0.29	280	6.3 x 7	0.29	280
47	5 x 7	0.49	160				5 x 7	0.49	160	6.3 x 7	0.24	280	6.3 x 7	0.24	280	6.3 x 7	0.24	280	6.3 x 7	0.29	280	6.3 x 7	0.29	280	
68														6.3 x 7	0.24	280	6.3 x 7	0.24	280	6.3 x 7	0.29	280	6.3 x 7	0.29	280
100					6.3 x 7	0.24	280				6.3 x 7	0.24	280	6.3 x 7	0.24	280	6.3 x 7	0.29	280	6.3 x 7	0.29	280			
150					6.3 x 7	0.24	280				6.3 x 7	0.24	280	6.3 x 7	0.29	280	6.3 x 7	0.29	280	6.3 x 7	0.29	280			
220	6.3 x 7	0.24	280				6.3 x 7	0.29	280	6.3 x 7	0.29	280	6.3 x 7	0.29	280	6.3 x 7	0.29	280	6.3 x 7	0.29	280				
330	6.3 x 7	0.29	280																						

Model No.

UAX series 16 ME 22 UAX

Series code  
Rated capacitance symbol  
Type code  
Rated voltage

SAX series 16 ME 22 SAX

Series code  
Rated capacitance symbol  
Type code  
Rated voltage

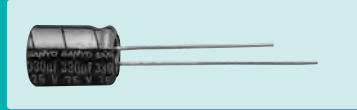
Case size ;  
φD x L (mm)

Rated ripple current  
mA r.m.s. (100kHz, 105°C)

Impedance (Ω)  
MAX. at 100kHz, 20°C

## ME-LS Series

Long Life

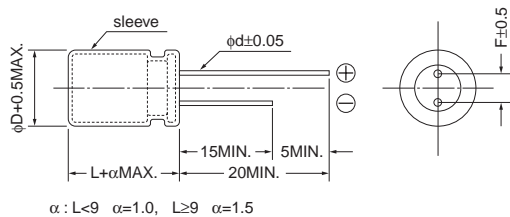


- 105°C, 3000hrs.
- Solvent proof ( $\phi 4$  to  $\phi 6.3$  ; within 3minutes,  $\phi 8$  ; within 5 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +105					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tan $\delta$ ) (MAX.) (120Hz/20°C)		0.30	0.28	0.24	0.18	0.16	0.14
Leakage current (L.C.) ( $\mu$ A/after 2min.) (MAX.)		The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	5	4	3	2	2	2
	Z-40°C/Z20°C	10	8	6	4	3	3
Endurance 105°C, 3000hrs. rated voltage applied (With the rated ripple current)	$\Delta$ C/C	Within ±30% of the initial value					
	tan $\delta$	≤ 3times the initial specified value					
	L.C.	≤ The initial specified value					

### Dimensions



(Unit : mm)

$\phi D$	4	5	6.3	8
F	1.5	2.0	2.5	3.5
$\phi d$	0.45	0.45	0.45	0.60

A pressure relief vent is attached to products  $\phi 8 \times 11.5$

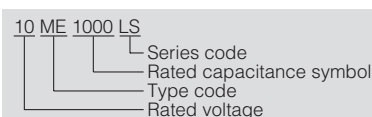
### Size List, Impedance, Rated Ripple Current

$\mu$ F \ V	6.3		10		16		25		35		50						
1.0											4X7	17.0	23				
2.2											4X7	13.0	26				
3.3											4X7	11.0	29				
4.7										4X7	6.6	37	5X7	9.0	37		
10					4X7	4.2	46			5X7	2.3	74	6.3X7	2.5	84		
22	4X7	4.2	46			5X7	2.3	74	5X7	2.3	74	6.3X7	1.2	120	6.3X7.5	1.6	112
33				5X7	2.3	74			6.3X7	1.2	120	6.3X7.5	0.75	163			
47	5X7	2.3	74			6.3X7	1.2	120	6.3X7.5	0.75	163	6.3X7.5	0.75	163	8X9	1.1	162
100	6.3X7	1.2	120			6.3X7.5	0.75	163	8X9	0.55	230				8X9	1.1	162
150				6.3X7.5	0.75	163	8X9	0.55	230								
220	6.3X7.5	0.75	163	8X9	0.55	230	8X9	0.55	230	8X11.5	0.40	298	8X11.5	0.40	298		
330	8X9	0.55	230				8X9	0.55	230	8X11.5	0.40	298					
470	8X9	0.55	230				8X11.5	0.40	298								
1000	8X11.5	0.40	298														

Case size ;  $\phi D \times L$  (mm)

Rated ripple current  
mAr.m.s. (100kHz, 105°C)

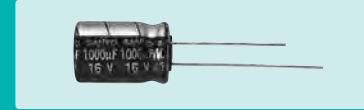
Model No.



Impedance ( $\Omega$ )  
MAX. at 100kHz, 20°C

## ME-CA Series

Low Impedance  
Miniature

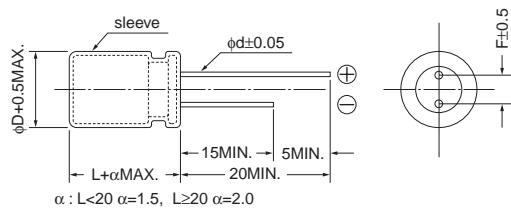


- 105°C, 1000 to 3000hrs.
- Solvent proof (within 5 minutes)

### Specifications

Items	Specifications					
Rated voltage (V)	6.3	10	16	25	35	50
Category temperature range (°C)	-55 to +105					
Capacitance tolerance (%)	±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.28	0.24	0.20	0.16	0.14	0.12
	When rated capacitance exceeds 1000µF, add 0.02 to the value above for each 1000µF increase.					
Leakage current (L.C.) (µA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	3	2	2	2
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	6	5	4	4	3
Endurance 105°C	Test	φ5 to φ8 : 1000hrs., φ10 : 2000hrs., φ12.5 to φ16 : 3000hrs.				
	ΔC/C	Within ±25% of the initial value				
rated voltage applied (With the rated ripple current)	tanδ	≤ Twice the initial specified value				
	L.C.	≤ The initial specified value				

### Dimensions



(Unit : mm)

φD	5	6.3	8	10	12.5	16
F	2.0	2.5	3.5	5.0	5.0	7.5
φd	0.5	0.5	0.6	0.6	0.6	0.8

A pressure relief vent is attached to products over φD=6.3

### Size List, Impedance, Rated Ripple Current

V Items Case size φD x L (mm)	6.3			10		
	Capacitance (µF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/10k to 200kHz)	Capacitance (µF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/10k to 200kHz)
5 x 11	220	0.50	180			
6.3 x 11	330	0.30	280	220	0.30	280
6.3 x 11	470	0.24	280	330	0.24	280
8 x 11.5	1000	0.15	560	470	0.16	410
10 x 12.5				1000	0.086	710
10 x 16	2200	0.066	950			
10 x 20	3300	0.047	1150	2200	0.047	1150
12.5 x 20	4700	0.042	1460	3300	0.042	1460
12.5 x 25	6800	0.031	1780	4700	0.031	1780
16 x 25	10000	0.026	2000	6800	0.026	2000
16 x 31.5				10000	0.022	2200
16 x 35.5	15000	0.022	2200			

## Size List, Impedance, Rated Ripple Current

V Case size Items φD x L (mm)	16			25		
	Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/10k to 200kHz)	Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/10k to 200kHz)
5 x 11	100	0.50	180			
6.3 x 11	220	0.24	280	100	0.30	280
8 x 11.5	330	0.16	410	220	0.16	410
8 x 11.5	470	0.15	560	330	0.15	560
10 x 12.5				470	0.086	710
10 x 16	1000	0.066	950			
10 x 20				1000	0.047	1150
12.5 x 20	2200	0.042	1460			
12.5 x 25	3300	0.035	1780	2200	0.035	1780
16 x 25	4700	0.026	2000	3300	0.026	2000
16 x 31.5	6800	0.022	2200	4700	0.022	2200

V Case size Items φD x L (mm)	35			50		
	Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/10k to 200kHz)	Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/10k to 200kHz)
5 x 11				0.47	5.5	20
5 x 11				1.0	3.3	30
5 x 11				2.2	3.0	45
5 x 11				3.3	2.7	55
5 x 11				4.7	2.0	90
5 x 11				10	1.7	110
5 x 11	33	0.72	180	22	1.2	120
5 x 11	47	0.50	180	33	0.95	130
6.3 x 11	100	0.24	280	47	0.56	190
8 x 11.5	220	0.15	560	100	0.30	320
10 x 12.5	330	0.086	710	220	0.16	520
10 x 16	470	0.066	950	330	0.12	670
10 x 20				470	0.088	820
12.5 x 20	1000	0.042	1460			
12.5 x 25				1000	0.053	1200
16 x 25	2200	0.026	2000			
16 x 31.5				2200	0.029	1750
16 x 35.5	3300	0.022	2200			

Model No. 16 ME 2200 CA

- L Series code
- Rated capacitance symbol
- Type code
- Rated voltage

## ME-CX Series

Low Impedance  
Miniature, Long Life

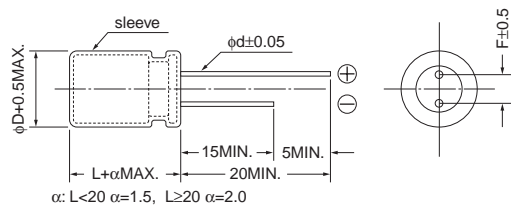


- 105°C, 2000 to 7000hrs.
- Solvent proof (within 5 minutes)

### Specifications

Items		Specifications				
Rated voltage (V)		6.3	10	16	25	35
Category temperature range (°C)		-55 to +105				
Capacitance tolerance (%)		±20 (120Hz/20°C)				
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.22	0.19	0.16	0.14	0.12
		When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.				
Leakage current (L.C.) (μA/after 2min.) (MAX.)		0.01CV				
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	2	2	2	2
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	4	4	3	3	3
Endurance 105°C	Test	φ5 to φ6.3 : 2000hrs., φ8 : 3000hrs., φ10 : 4000hrs., φ12.5 : 5000hrs., φ16 to φ18 : 7000hrs.				
rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value				
	tanδ	≤ Twice the initial specified value				
	L.C.	≤ The initial specified value				

### Dimensions



(Unit : mm)

φD	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5	0.5	0.6	0.6	0.6*	0.8	0.8

\*φ12.5 x 30 : φd=0.8

A pressure relief vent is attached to products over φD=6.3

### Size List, Impedance, Rated Ripple Current

Case size φD x L (mm)	Items	6.3			10		
		Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/10k to 200kHz)	Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/10k to 200kHz)
5 x 11		180	0.34	205	150	0.34	205
6.3 x 11		330	0.17	330	270	0.17	330
6.3 x 11		390	0.17	330			
8 x 11.5		680	0.11	580	470	0.11	580
8 x 11.5					560	0.11	580
8 x 15		1000	0.080	750	680	0.080	750
8 x 20	*1	1200	0.060	1000	*1 1000	0.060	1000
8 x 20	*1	1500	0.060	1000			
10 x 12.5		1200	0.063	900	820	0.063	900
10 x 16		1500	0.049	1200	1000	0.049	1200
10 x 16					1200	0.049	1200
10 x 20		2200	0.036	1450	1500	0.036	1450
10 x 22		2700	0.036	1500	1800	0.036	1500
12.5 x 20		3900	0.035	1660	2700	0.035	1660
12.5 x 25		4700	0.027	2000	3900	0.027	2000
12.5 x 25		5600	0.027	2000			
12.5 x 30	*1	6800	0.024	2450	*1 4700	0.024	2450
16 x 21	*2	5600	0.032	2000	*2 3900	0.032	2000
16 x 25		6800	0.022	2560	4700	0.022	2560
16 x 25		8200	0.022	2560	5600	0.022	2560
16 x 31.5		10000	0.017	3010	6800	0.017	3010
16 x 31.5					8200	0.017	3010
16 x 35.5		12000	0.016	3150	10000	0.016	3150
18 x 21	*2	6800	0.030	2490	*2 5600	0.030	2490
18 x 25	*2	10000	0.022	2740	*2 6800	0.022	2740
18 x 30.5	*2	12000	0.017	3330	*2 10000	0.017	3330
18 x 35.5		15000	0.016	3680	12000	0.016	3680

\*1 ; Series symbol is CXL, \*2 ; Series symbol is CXS



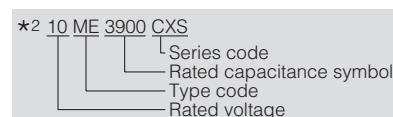
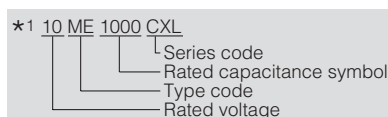
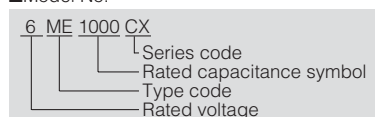
## Size List, Impedance, Rated Ripple Current

V Case size φD x L (mm)	Items	16			25		
		Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)	Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)
		(μF)	(20°C/100kHz)	(105°C/10k to 200kHz)	(μF)	(20°C/100kHz)	(105°C/10k to 200kHz)
5 x 11		100	0.34	205	68	0.34	205
6.3 x 11		180	0.17	330	120	0.17	330
8 x 11.5		330	0.11	580	220	0.11	580
8 x 15		470	0.080	750	330	0.080	750
8 x 20		680	0.060	1000	470	0.060	1000
10 x 12.5		560	0.063	900	390	0.063	900
10 x 16		820	0.049	1200	560	0.049	1200
10 x 20		1000	0.036	1450	680	0.036	1450
10 x 20					820	0.036	1450
10 x 22		1200	0.036	1500	1000	0.036	1500
12.5 x 20		1500	0.035	1660	1200	0.035	1660
12.5 x 20		1800	0.035	1660			
12.5 x 25		2200	0.027	2000	1800	0.027	2000
12.5 x 25		2700	0.027	2000			
12.5 x 30	*1	3300	0.024	2450	*1 2200	0.024	2450
16 x 21	*2	2700	0.032	2000	*2 1800	0.032	2000
16 x 25		3300	0.022	2560	2700	0.022	2560
16 x 25		3900	0.022	2560			
16 x 31.5		4700	0.017	3010	3300	0.017	3010
16 x 31.5		5600	0.017	3010			
16 x 35.5		6800	0.016	3150	3900	0.016	3150
18 x 21	*2	3300	0.030	2490	*2 2200	0.030	2490
18 x 25	*2	4700	0.022	2740	*2 3300	0.022	2740
18 x 30.5					*2 3900	0.017	3330
18 x 35.5		8200	0.016	3680	5600	0.016	3680

V Case size φD x L (mm)	Items	35		
		Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)
		(μF)	(20°C/100kHz)	(105°C/10k to 200kHz)
5 x 11		47	0.34	205
6.3 x 11		100	0.17	330
8 x 11.5		150	0.11	580
8 x 15		220	0.080	750
8 x 20	*1	330	0.060	1000
10 x 12.5		270	0.063	900
10 x 16		330	0.049	1200
10 x 16		390	0.049	1200
10 x 20		470	0.036	1450
10 x 20		560	0.036	1450
10 x 22		680	0.036	1500
12.5 x 20		820	0.035	1660
12.5 x 25		1200	0.027	2000
12.5 x 30	*1	1500	0.024	2450
16 x 21	*2	1200	0.032	2000
16 x 25		1800	0.022	2560
16 x 31.5		2700	0.017	3010
16 x 35.5		3300	0.016	3150
18 x 21	*2	1500	0.030	2490
18 x 25		2200	0.022	2740
18 x 35.5		3900	0.016	3680

\*1 ; Series symbol is CXL, \*2 ; Series symbol is CXS

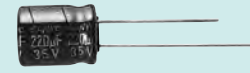
### Model No.



## ME-AX Series

Low Impedance

Long Life

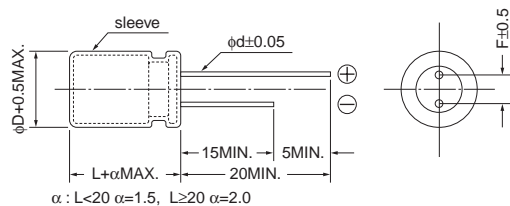


- 105°C, 2500 to 10000hrs.
- Solvent proof (within 5 minutes)

### Specifications

Items		Specifications								
Rated voltage (V)		6.3	10	16	25	35	50	63	100	
Category temperature range (°C)		-55 to +105							-40 to +105	
Capacitance tolerance (%)		±20							(120Hz/20°C)	
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.22	0.19	0.16	0.14	0.12	0.10	0.10	0.10	
		When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.								
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3								
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	2	2	2	2	2	2	2	
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	4	4	3	3	3	2	2	-	
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ5 : 2500hrs., φ6.3 : 3000hrs., φ8 x 11.5, φ8 x 12.5 : 3500hrs., φ8 x 15, φ8 x 20 : 4500hrs., φ10 : 5000hrs., φ12.5 : 7000hrs., φ16 to φ18 : 10000hrs.								
	ΔC/C	Within ±20% of the initial value								
	tanδ	≤ Twice the initial specified value								
	L.C.	≤ The initial specified value								

### Dimensions



(Unit : mm)

φD	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8

A pressure relief vent is attached to products over φD=6.3

### Size List, Impedance, Rated Ripple Current

Case Size φD x L (mm)	6.3		10			
	Capacitance	Impedance (ΩMAX.)	Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)	
	(μF)	(20°C/100kHz)	(μF)	(20°C/100kHz)	(105°C/10k to 200kHz)	
5 x 11	150	0.42	100	0.42	190	
6.3 x 11	270	0.22	220	0.22	300	
8 x 11.5	470	0.11	330	0.11	560	
8 x 12.5	560	0.11	390	0.11	570	
8 x 15	680	0.085	470	0.085	730	
8 x 20	1000	0.069	*1 680	0.069	800	
10 x 12.5	820	0.085	680	0.085	800	
10 x 16	1200	0.062	820	0.062	1050	
10 x 20	1500	0.044	1200	0.044	1250	
10 x 22	1800	0.039	1500	0.039	1450	
12.5 x 20	2700	0.038	2200	0.038	1600	
12.5 x 25	3900	0.029	2700	0.029	1800	
16 x 25	5600	0.022	3900	0.022	2100	
16 x 31.5	8200	0.018	5600	0.018	2350	
16 x 35	10000	0.018	6800	0.018	2550	
18 x 35.5	12000	0.018	8200	0.018	2800	

\*1 ; Series symbol is AXL

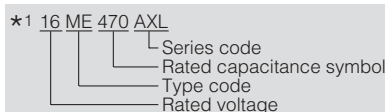
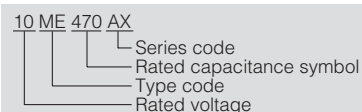
## Size List, Impedance, Rated Ripple Current

Case Size φD x L (mm)	Items	16			25		
		Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)	Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)
		(μF)	(20°C/100kHz)	(105°C/10k to 200kHz)	(μF)	(20°C/100kHz)	(105°C/10k to 200kHz)
5 x 11		68	0.42	190	47	0.42	190
6.3 x 11		150	0.22	300	100	0.22	300
8 x 11.5		220	0.11	560	150	0.11	560
8 x 12.5		270	0.11	570	180	0.11	570
8 x 15		330	0.085	730	220	0.085	730
8 x 20	*1	470	0.069	800	330	0.069	800
10 x 12.5		470	0.085	800	270	0.085	800
10 x 16		560	0.062	1050	390	0.062	1050
10 x 20		820	0.044	1250	560	0.044	1250
10 x 22		1000	0.039	1450	680	0.039	1450
12.5 x 20		1200	0.038	1600	1000	0.038	1600
12.5 x 25		1800	0.029	1800	1200	0.029	1800
16 x 25		2700	0.022	2100	1800	0.022	2100
16 x 31.5		3900	0.018	2350	2700	0.018	2350
16 x 35		4700	0.018	2550	3300	0.018	2550
18 x 35.5		5600	0.018	2800	3900	0.018	2800

Case Size φD x L (mm)	Items	35			50		
		Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)	Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)
		(μF)	(20°C/100kHz)	(105°C/10k to 200kHz)	(μF)	(20°C/100kHz)	(105°C/10k to 200kHz)
5 x 11		4.7	1.2	115	0.47 to 4.7	5.5 to 2.0	20 to 90
5 x 11		10	0.90	140	10	1.7	110
5 x 11		22	0.42	190	15	1.2	130
5 x 11		33	0.42	190	22	0.70	160
6.3 x 11		68	0.22	300	47	0.43	220
8 x 11.5		100	0.11	560	68	0.26	360
8 x 12.5		120	0.11	570	82	0.24	400
8 x 15		150	0.085	730	100	0.18	500
8 x 20	*1	220	0.069	800	150	0.16	650
10 x 12.5		220	0.085	800	120	0.16	550
10 x 16		270	0.062	1050	180	0.12	760
10 x 20		330	0.044	1250	270	0.088	950
10 x 22		470	0.039	1450	330	0.072	1000
12.5 x 20		680	0.038	1600	470	0.059	1200
12.5 x 25		1000	0.029	1800	560	0.045	1400
16 x 25		1500	0.022	2100	1000	0.039	1750
16 x 31.5		2200	0.018	2350	1200	0.025	2100
16 x 35	*1	2200	0.018	2550	1500	0.025	2300
18 x 35.5		2700	0.018	2800	1800	0.024	2400

Case Size φD x L (mm)	Items	63			100		
		Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)	Capacitance	Impedance (ΩMAX.)	Ripple current (mAr.m.s.)
		(μF)	(20°C/100kHz)	(105°C/10k to 200kHz)	(μF)	(20°C/100kHz)	(105°C/10k to 200kHz)
5 x 11		18	1.6	140	5.6	2.7	120
6.3 x 11		33	0.90	200	12	1.4	170
8 x 11.5		68	0.52	275	22	0.81	230
8 x 12.5	*1	68	0.47	300	*1 22	0.79	250
8 x 15		82	0.34	360	27	0.64	295
8 x 20	*1	120	0.21	510	*1 39	0.36	400
10 x 12.5		120	0.26	420	39	0.39	360
10 x 16		150	0.20	525	47	0.35	420
10 x 20		220	0.15	765	68	0.24	630
10 x 22		270	0.12	840	82	0.21	700
12.5 x 20		330	0.10	960	100	0.15	800
12.5 x 25		470	0.064	1200	150	0.11	920
16 x 25		680	0.052	1500	220	0.071	1100
16 x 31.5		1000	0.042	1750	330	0.049	1490
16 x 35		1200	0.036	1920	390	0.043	1630
18 x 35.5		1500	0.033	2000	470	0.038	1700

Model No.



\*1 ; Series symbol is AXL

## ME-WX Series

Low Impedance  
High Ripple Current

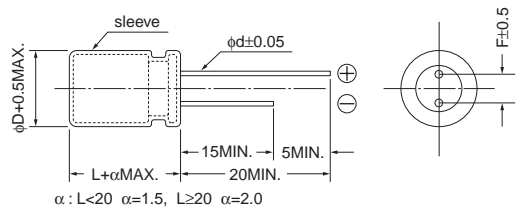


- 105°C, 2000 to 5000hrs.
- Do not clean the capacitors using solvent.

### Specifications

Items	Specifications					
Rated voltage (V)	6.3	10	16	25	35	50
Category temperature range (°C)	-40 to +105					
Capacitance tolerance (%)	±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.22	0.19	0.16	0.14	0.12	0.10
Leakage current (L.C.) (μA/after 2min.) (MAX.)	0.01CV					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	2	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	3	3	3	3
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ5 to φ6.3 : 2000hrs., φ8 : 3000hrs., φ10 to φ12.5 : 4000hrs., φ16 : 5000hrs.				
	ΔC/C	Within ±25% of the initial value				
	tanδ	≤ Twice the initial specified value				
	L.C.	≤ The initial specified value				

### Dimensions



φD	5	6.3	8	10	12.5	16
F	2.0	2.5	3.5	5.0	5.0	7.5
φd	0.5	0.5	0.6	0.6	0.6*	0.8

\*φ12.5 x 30 : φd=0.8

A pressure relief vent is attached to products over φD=6.3

### Size List, Impedance, Rated Ripple Current

Case Size φD x L (mm)	Items	6.3			10		
		Capacitance (μF)	Impedance and E.S.R (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)	Capacitance (μF)	Impedance and E.S.R (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)
5 x 11		150	0.30	250	100	0.30	250
6.3 x 11		330	0.13	405	220	0.13	405
8 x 11.5		560	0.072	760	470	0.072	760
8 x 15		820	0.056	995	*1 680	0.056	995
8 x 20	*1	1200	0.041	1250	*1 1000	0.041	1250
10 x 12.5		1000	0.053	1030	680	0.053	1030
10 x 16		1200	0.038	1430	1000	0.038	1430
10 x 20		1500	0.023	1820	1200	0.023	1820
10 x 20		2200	0.023	1820	1500	0.023	1820
10 x 23	*3	2200	0.022	2150	*3 1500	0.022	2150
12.5 x 20		3300	0.021	2360	2200	0.021	2360
12.5 x 25		3900	0.018	2770	3300	0.018	2770
12.5 x 30		4700	0.016	3290	3900	0.016	3290
16 x 21		5600	0.018	3140	*2 3900	0.018	3140
16 x 25		6800	0.016	3460	5600	0.016	3460

\*1 ; Series symbol is WXL

\*2 ; Series symbol is WXS

\*3 ; Series symbol is WXV

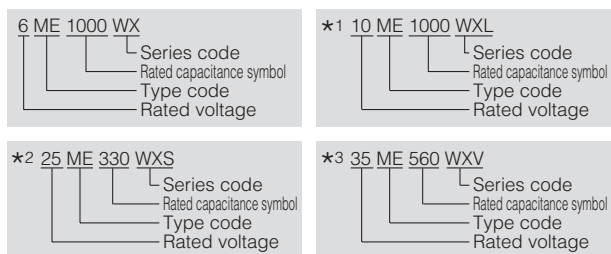
## Size List, Impedance, Rated Ripple Current

Case Size φD x L (mm)	Items	16			25		
		Capacitance	Impedance and E.S.R (ΩMAX.)	Ripple current (mAr.m.s.)	Capacitance	Impedance and E.S.R (ΩMAX.)	Ripple current (mAr.m.s.)
		(μF)	(20°C/100kHz)	(105°C/100kHz)	(μF)	(20°C/100kHz)	(105°C/100kHz)
5 x 11		56	0.30	250	47	0.30	250
6.3 x 11		120	0.13	405	100	0.13	405
8 x 11.5		330	0.072	760	220	0.072	760
8 x 15	*1	470	0.056	995	330	0.056	995
8 x 20	*1	680	0.041	1250	*1 470	0.041	1250
10 x 12.5		470	0.053	1030	*2 330	0.053	1030
10 x 16		680	0.038	1430	470	0.038	1430
10 x 20		1000	0.023	1820	680	0.023	1820
10 x 20		1200	0.023	1820	820	0.023	1820
10 x 23	*3	1200	0.022	2150	*3 820	0.022	2150
12.5 x 20		1500	0.021	2360	1000	0.021	2360
12.5 x 25		2200	0.018	2770	1500	0.018	2770
12.5 x 30		2700	0.016	3290	1800	0.016	3290
16 x 21	*2	2700	0.018	3140	*2 1800	0.018	3140
16 x 25		3900	0.016	3460	2700	0.016	3460

Case Size φD x L (mm)	Items	35			50		
		Capacitance	Impedance and E.S.R (ΩMAX.)	Ripple current (mAr.m.s.)	Capacitance	Impedance and E.S.R (ΩMAX.)	Ripple current (mAr.m.s.)
		(μF)	(20°C/100kHz)	(105°C/100kHz)	(μF)	(20°C/100kHz)	(105°C/100kHz)
5 x 11		33	0.30	250	22	0.34	238
6.3 x 11		56	0.13	405	47	0.14	385
8 x 12.5	*3	150	0.072	760	100	0.074	724
8 x 15		220	0.056	995	120	0.061	950
8 x 20	*1	270	0.041	1250	180	0.046	1190
10 x 12.5	*2	220	0.053	1030	150	0.061	979
10 x 16		330	0.038	1430	220	0.042	1370
10 x 20		470	0.023	1820	270	0.030	1580
10 x 23	*3	560	0.022	2150	330	0.028	1870
12.5 x 20		680	0.021	2360	470	0.027	2050
12.5 x 25		1000	0.018	2770	560	0.023	2410
12.5 x 30		1200	0.016	3290	680	0.021	2860
16 x 21	*2	1200	0.018	3140	820	0.023	2730
16 x 25		1800	0.016	3460	1000	0.021	3010

\*1 ; Series symbol is WXL  
 \*2 ; Series symbol is WXS  
 \*3 ; Series symbol is WXV

Model No.



## ME-WA Series

105°C, Miniature, Long Life

Low Impedance, High Ripple Current

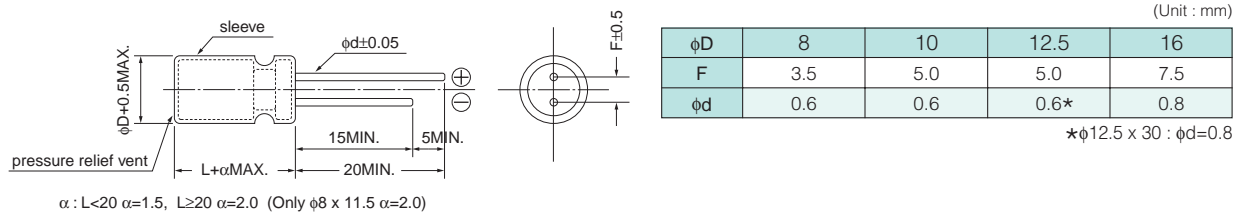


- 105°C, 8000 to 10000hrs.
- Do not clean the capacitors using solvent.

### Specifications

Items		Specifications				
Rated voltage (V)		6.3	10	16	25	35
Category temperature range (°C)		-40 to +105				
Capacitance tolerance (%)		±20 (120Hz/20°C)				
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.22	0.19	0.16	0.14	0.12
When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.						
Leakage current (L.C.) (μA/after 2min.) (MAX.)		0.03CV				
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	2	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	3	3	3	3
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ8 : 8000hrs., φ10 to φ16 : 10000hrs.				
	ΔC/C	Within ±25% of the initial value (6.3V, 10V : ±30%)				
	tanδ	≤ Twice the initial specified value				
	L.C.	≤ The initial specified value				

### Dimensions



### Size List, Impedance, Rated Ripple Current

Case Size φD x L (mm)	Items	6.3			10		
		Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)	Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)
8 x 11.5		820	0.059	945	680	0.059	945
8 x 15	*1	1200	0.046	1250	*1 1000	0.046	1250
8 x 20		1500	0.031	1500	*1 1500	0.031	1500
10 x 12.5		1200	0.043	1330	1000	0.043	1330
10 x 16		1800	0.030	1760	1500	0.030	1760
10 x 20		2200	0.021	1960	1800	0.021	1960
10 x 22		2700	0.020	2250	2200	0.020	2250
12.5 x 20		3900	0.019	2480	3300	0.019	2480
12.5 x 25		4700	0.016	2900	3900	0.016	2900
12.5 x 30		5600	0.014	3450	*1 4700	0.014	3450
16 x 21		6800	0.018	3250	4700	0.018	3250
16 x 25		8200	0.014	3630	6800	0.014	3630

\*1 : Series Symbol is WAL

## Size List, Impedance, Rated Ripple Current

Case Size φD x L (mm)	Items	16			25		
		Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)	Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)
		8 x 11.5	470	0.059	945	330	0.059
8 x 15	*1 680	0.046	1250	390	0.046	1250	
8 x 20	*1 1000	0.031	1500	560	0.031	1500	
10 x 12.5	680	0.043	1330	470	0.043	1330	
10 x 16	1000	0.030	1760	680	0.030	1760	
10 x 20	1500	0.021	1960	820	0.021	1960	
10 x 22	1800	0.020	2250	1000	0.020	2250	
12.5 x 20	2200	0.019	2480	1500	0.019	2480	
12.5 x 25	2700	0.016	2900	1800	0.016	2900	
12.5 x 30	*1 3300	0.014	3450	*1 2200	0.014	3450	
16 x 21	3300	0.018	3250	2200	0.018	3250	
16 x 25	4700	0.014	3630	3300	0.014	3630	

Case Size φD x L (mm)	Items	35		
		Capacitance (μF)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)
		8 x 11.5	220	0.059
8 x 15	270	0.046	1250	
8 x 20	390	0.031	1500	
10 x 12.5	330	0.043	1330	
10 x 16	470	0.030	1760	
10 x 20	560	0.021	1960	
10 x 22	680	0.020	2250	
12.5 x 20	1000	0.019	2480	
12.5 x 25	1200	0.016	2900	
12.5 x 30	*1 1500	0.014	3450	
16 x 21	1500	0.018	3250	
16 x 25	2200	0.014	3630	

\*1 ; Series Symbol is WAL

### Model No.

10 ME 1000 WA

- Series code
- Rated capacitance symbol
- Type code
- Rated voltage

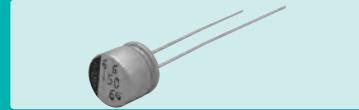
\*1 16 ME 1000 WAL

- Series code
- Rated capacitance symbol
- Type code
- Rated voltage

## MB-UWG Series

Low ESR, High Ripple Current

5mm Height

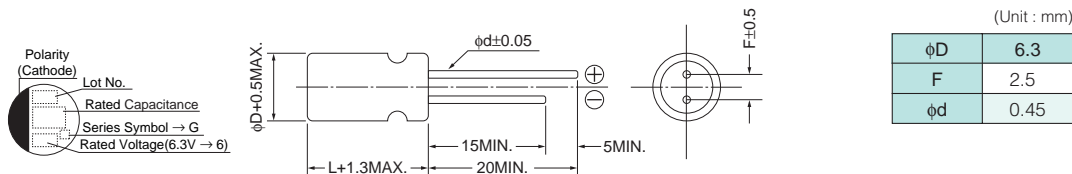


- 105°C, 1000hrs.
- Laminated aluminum case
- Do not clean the capacitors using solvent.

### Specifications

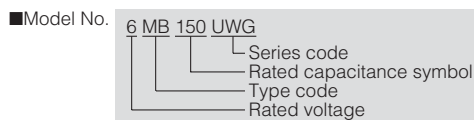
Items		Specifications			
Rated voltage (V)		6.3	10	16	25
Category temperature range (°C)		-40 to +105			
Capacitance tolerance (%)		±20 (120Hz/20°C)			
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.24	0.20	0.16	0.14
Leakage current (L.C.) (μA/after 2min.) (MAX.)		0.03CV			
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	3	3	3
Endurance 105°C, 1000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value (6.3V, 10V : ±30%)			
	tanδ	≤ Twice the initial specified value			
	L.C.	≤ The initial specified value			

### Marking, Dimensions



### Size List, E.S.R. , Rated Ripple Current

V	6.3			10			16			25		
	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 105°C/100kHz	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 105°C/100kHz	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 105°C/100kHz	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 105°C/100kHz
39										6.3 x 5	0.14	360
68							6.3 x 5	0.14	360			
100				6.3 x 5	0.14	360						
150	6.3 x 5	0.14	360									

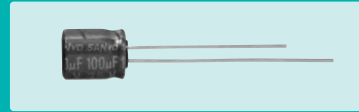




## ME-SWG Series

Low ESR, Miniature

7mm Height

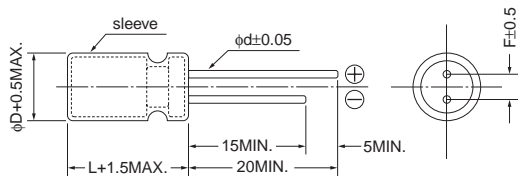


- 105°C, 1000 to 2000hrs.
- Do not clean the capacitors using solvent.

### Specifications

Items		Specifications				
Rated voltage (V)		6.3	10	16	25	35
Category temperature range (°C)		-40 to +105				
Capacitance tolerance (%)		±20 (120Hz/20°C)				
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.24	0.20	0.16	0.14	0.12
Leakage current (L.C.) (μA/after 2min.) (MAX.)		0.03CV				
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	2	2	2	2	2
	Z-40°C/Z20°C	3	3	3	3	3
Endurance 105°C	Test	φ5 : 1000hrs., φ6.3 : 2000hrs., (6ME330SWG, 10ME220SWG : 1000hrs.)				
rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value(6.3V, 10V : ±30%)				
	tanδ	≤ Twice the initial specified value				
	L.C.	≤ The initial specified value				

### Dimensions

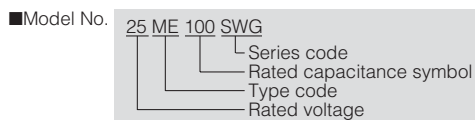


(Unit : mm)

	5	6.3
φD	5	6.3
F	2.0	2.5
φd	0.45	0.45

### Size List, E.S.R. , Rated Ripple Current

V Items μF	6.3			10			16			25			35		
	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 105°C/100kHz	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 105°C/100kHz	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 105°C/100kHz	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 105°C/100kHz	Case size φD x L (mm)	E.S.R. (ΩMAX.) 20°C/100kHz	Ripple current (mAr.m.s.) 105°C/100kHz
22										5 x 7	0.17	390	5 x 7	0.17	390
39							5 x 7	0.17	390	5 x 7	0.17	390			
47													6.3 x 7	0.082	760
56				5 x 7	0.17	390									
100	5 x 7	0.17	390	6.3 x 7	0.082	760	6.3 x 7	0.082	760	6.3 x 7	0.082	760			
150	6.3 x 7	0.082	760	6.3 x 7	0.082	760	6.3 x 7	0.082	760						
220	6.3 x 7	0.082	760	6.3 x 7	0.082	760									
330	6.3 x 7	0.082	760												



## ME-WG Series Low ESR, Miniature

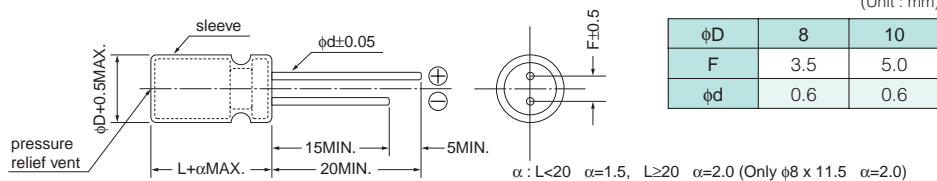


- 105°C, 2000 to 4000hrs.
- Do not clean the capacitors using solvent.

### Specifications

Items		Specifications			
Rated voltage (V)		6.3	10	16	25
Category temperature range (°C)		-40 to +105			
Capacitance tolerance (%)		±20 (120Hz/20°C)			
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.22	0.19	0.16	0.14
		When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.			
Leakage current (L.C.) (μA/after 2min.) (MAX.)		0.03CV			
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	2	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	3	3	3	3
Endurance 105°C	Test	φ8x11.5, φ8x16, φ10x12.5, φ10x16 : 2000hrs., φ8x20 : 3000hrs., φ10x20, φ10x23 : 4000hrs.			
rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value			
	tanδ	≤ Twice the initial specified value			
	L.C.	≤ The initial specified value			

### Dimensions

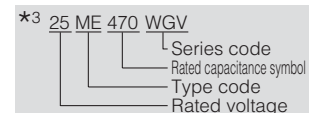
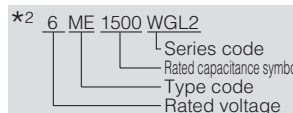
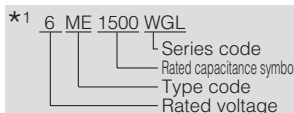
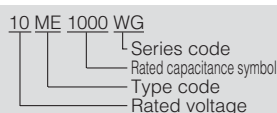


### Size List, E.S.R. , Rated Ripple Current

V	Items	6.3			10			16			25		
		Case size φD x L (mm)	E.S.R. (mΩMAX.)	Ripple current (mAr.m.s.)	Case size φD x L (mm)	E.S.R. (mΩMAX.)	Ripple current (mAr.m.s.)	Case size φD x L (mm)	E.S.R. (mΩMAX.)	Ripple current (mAr.m.s.)	Case size φD x L (mm)	E.S.R. (mΩMAX.)	Ripple current (mAr.m.s.)
220													
330													
470													
680													
820													
1000													
1200													
1500													
1800													
2200													
3300													

\*1 ; Series symbol is WGL \*2 ; Series symbol is WGL2 \*3 ; Series symbol is WGV

Model No.



## ME-PX Series 125°C, 4000Hrs. High Performance

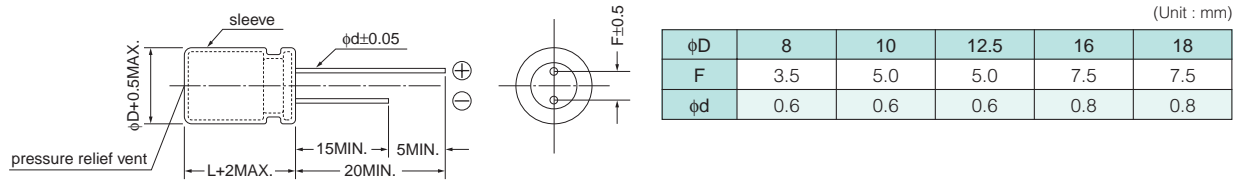


- 125°C, 2000 to 4000hrs.
- Solvent proof (within 5 minutes)

### Specifications

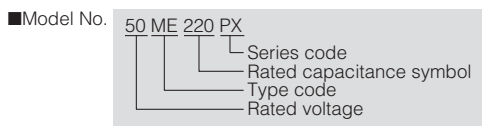
Items	Specifications					
Rated voltage (V)	10	16	25	35	50	100
Category temperature range (°C)	-55 to +125					
Capacitance tolerance (%)	±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.20	0.16	0.14	0.12	0.10	0.08
	When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.					
Leakage current (L.C.) (μA/after 2min.) (MAX.)	The greater value of either 0.01CV or 3					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	2	2	2	2	2
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	4	3	3	3	2
Endurance 125°C	Test	φ8 : 2000hrs., φ10 : 3000hrs., φ12.5 to φ18 : 4000hrs.				
rated voltage applied (With the rated ripple current)	ΔC/C	Within ±30% of the initial value				
	tanδ	≤ 3times the initial specified value				
	L.C.	≤ The initial specified value				

### Dimensions



### Size List, Impedance, Rated Ripple Current

V	10			16			25			35			50			100		
	Case size φD x L (mm)	Impedance (ΩMAX.) 20°C/100kHz	Ripple current (mA r.m.s.) 125°C/10k to 100kHz	Case size φD x L (mm)	Impedance (ΩMAX.) 20°C/100kHz	Ripple current (mA r.m.s.) 125°C/10k to 100kHz	Case size φD x L (mm)	Impedance (ΩMAX.) 20°C/100kHz	Ripple current (mA r.m.s.) 125°C/10k to 100kHz	Case size φD x L (mm)	Impedance (ΩMAX.) 20°C/100kHz	Ripple current (mA r.m.s.) 125°C/10k to 100kHz	Case size φD x L (mm)	Impedance (ΩMAX.) 20°C/100kHz	Ripple current (mA r.m.s.) 125°C/10k to 100kHz	Case size φD x L (mm)	Impedance (ΩMAX.) 20°C/100kHz	Ripple current (mA r.m.s.) 125°C/10k to 100kHz
1.0													8 x 11.5	2.0	28			
2.2													8 x 11.5	1.8	42			
3.3													8 x 11.5	1.5	49			
4.7													8 x 11.5	1.15	70	8 x 11.5	2.0	100
10													8 x 11.5	0.95	150	8 x 11.5	1.5	150
22													8 x 11.5	0.65	210	8 x 12.5	1.5	190
33													8 x 12.5	0.45	230	10 x 12.5	0.75	330
47									8 x 12.5	0.45	230	8 x 12.5	0.45	230	10 x 16	0.57	400	
100				8 x 11.5	0.39	250	8 x 12.5	0.26	280	10 x 12.5	0.35	315	10 x 12.5	0.35	315	12.5 x 20	0.29	580
220	8 x 12.5	0.26	280	10 x 12.5	0.20	350	10 x 12.5	0.17	380	10 x 16	0.29	420	10 x 20	0.20	560	16 x 25	0.22	670
330	10 x 12.5	0.20	350	10 x 12.5	0.17	380	10 x 16	0.15	490	10 x 20	0.20	560	12.5 x 20	0.12	630	16 x 31.5	0.15	810
470	10 x 12.5	0.17	380	10 x 16	0.15	490	10 x 20	0.12	590	12.5 x 20	0.12	630	12.5 x 25	0.10	770	18 x 31.5	0.11	950
1000	10 x 20	0.12	590	12.5 x 20	0.073	770	12.5 x 25	0.050	1050	16 x 25	0.058	980	16 x 31.5	0.045	1200			
2200	12.5 x 25	0.050	1050	16 x 25	0.044	1150	16 x 31.5	0.030	1500									
3300	16 x 25	0.044	1150	16 x 31.5	0.030	1500												
4700	16 x 31.5	0.030	1500															



## ME-PX Series 125°C Mid. and High Voltage

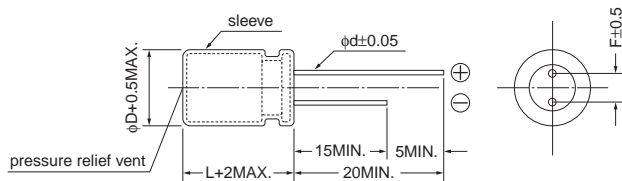


- 125°C, 2000hrs.
- Do not clean the capacitors using solvent.

### Specifications

Items	Specifications					
Rated voltage (V)	160	200	250	350	400	
Category temperature range (°C)	-40 to +125			-25 to +125		
Capacitance tolerance (%)	±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.20	0.20	0.20	0.24	0.24	
Leakage current (L.C.) (μA/after 2min.) (MAX.)	0.02CV + 25					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	3	3	3	6	6
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	6	6	6	-	-
Endurance 125°C, 2000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±20% of the initial value				
	tanδ	≤ Twice the initial specified value				
	L.C.	≤ The initial specified value				

### Dimensions



(Unit : mm)

φD	10	12.5	16
F	5.0	5.0	7.5
φd	0.6	0.6	0.8

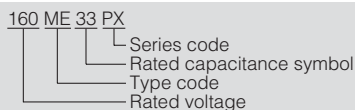
### Size List, Rated Ripple Current

μF	160		200		250		350		400	
	V									
4.7							10 x 20	53	10 x 20	53
10			10 x 20	78	10 x 20	78	10 x 20	67	12.5 x 20	86
22	10 x 20	115	10 x 20	95	12.5 x 20	128	12.5 x 25	139	12.5 x 25	142
33	10 x 20	125	12.5 x 20	157	12.5 x 25	171	16 x 25	189	16 x 25	189
47	12.5 x 20	187	12.5 x 25	204	16 x 25	225	16 x 31.5	243	16 x 31.5	243
68	12.5 x 20	200	16 x 21	250	16 x 31.5	292				
100	16 x 25	329								
150	16 x 31.5	434								

Case size : φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 125°C)

Model No.



## ME-FC·FD Series

105°C Miniature, Mid. and High Voltage  
105°C Low Profile, Mid. and High Voltage

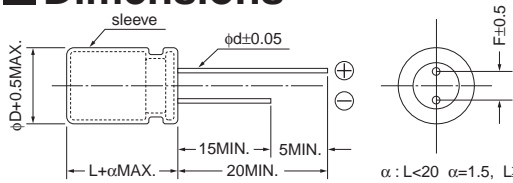


- 105°C, 1000 to 2000hrs.
- Do not clean the capacitors using solvent.

### Specifications

Items	Specifications						
Rated voltage (V)	160	200	250	350	400	450	
Category temperature range (°C)	-40 to +105					-25 to +105	
Capacitance tolerance (%)	±20					(120Hz/20°C)	
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.20	0.20	0.20	0.25	0.25	0.25	
Leakage current (L.C.) (μA/after 2min.) (MAX.)	CV≤1000	0.03CV+15					
	CV>1000	0.02CV+25					
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	3	3	3	4	6	6
	Z-40°C/Z20°C	6	6	6	8	10	—
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ5 to φ8 : 1000hrs., φ10 to φ18 : 2000hrs.					
	ΔC/C	Within ±20% of the initial value					
	tanδ	≤ Twice the initial specified value					
	L.C.	≤ The initial specified value					

### Dimensions



α : L<20 α=1.5, L≥20 α=2.0  
A pressure relief vent is attached to products over φD=6.3

(Unit : mm)

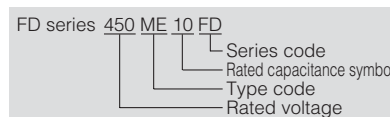
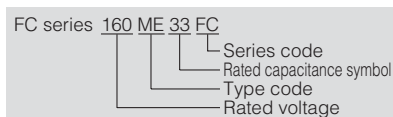
φD	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8

### Size List, Rated Ripple Current

μF \ V	160	200	250	350	400	450						
0.47	5 x 11	7	5 x 11	8	5 x 11	8	6.3 x 11	10	6.3 x 11	10		
1.0	5 x 11	15	5 x 11	16	5 x 11	18	6.3 x 11	20	8 x 11.5	20	8 x 12.5	18
2.2	6.3 x 11	22	6.3 x 11	24	6.3 x 11	25	8 x 11.5	28	8 x 11.5	28	10 x 16	28
3.3	6.3 x 11	28	6.3 x 11	32	8 x 11.5	34	8 x 12.5	36	10 x 12.5	36	10 x 20	36
4.7	6.3 x 11	39	8 x 11.5	40	8 x 11.5	41	10 x 12.5	47	10 x 16	47	12.5 x 20	47
10	8 x 11.5	63	8 x 12.5	64	10 x 12.5	66	10 x 20	70	10 x 20	70	12.5 x 25 16 x 21	70
22	10 x 12.5	107	10 x 16	112	10 x 20	119	12.5 x 25 16 x 21	123	12.5 x 25 16 x 21	126	16 x 25 18 x 21	125
33	10 x 20	137	10 x 20	147	12.5 x 20	154	16 x 25 18 x 21	158	16 x 25 18 x 21	161	16 x 30 18 x 25	154
47	12.5 x 20	172	12.5 x 20	175	12.5 x 25 16 x 21	182	16 x 30 18 x 25	182	16 x 30 18 x 25	189	18 x 35.5	172
68	12.5 x 20	217	12.5 x 25 16 x 21	228	16 x 25 18 x 21	235	16 x 35.5 18 x 30.5	242	18 x 35.5	249		
82	12.5 x 25 16 x 21	270	16 x 21	277	16 x 30 18 x 25	284	18 x 35.5	294				
100	12.5 x 25 16 x 21	287	16 x 25 18 x 21	301	16 x 35.5 18 x 25	302						
150	16 x 30 18 x 25	385	16 x 35.5 18 x 30.5	403	18 x 35.5	412						
220	16 x 35.5 18 x 30.5	522	18 x 35.5	532								

Upper ; FC series  
Lower ; FD series  
0.47μF to 4.7μF ; FC series

■ Model No.



Rated ripple current  
mAr.m.s. (120Hz, 105°C)

Case size ; φD x L (mm)

## ME-FAZ Series

Low Impedance  
High Ripple, Mid. Voltage

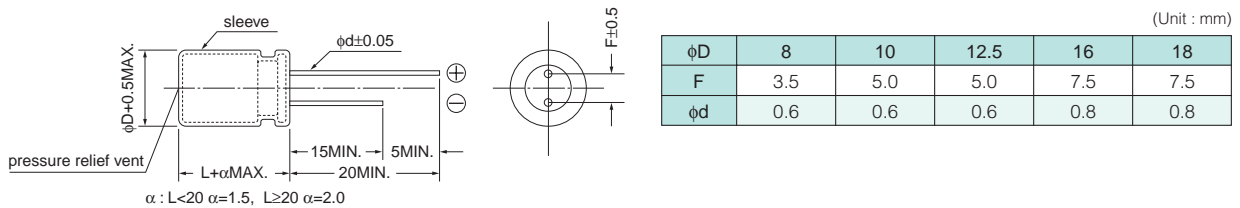


- 105°C, 1000 to 2000hrs.
- Do not clean the capacitors using solvent.

### Specifications

Items	Specifications			
Rated voltage (V)	160	180	200	250
Category temperature range (°C)	-40 to +105			
Capacitance tolerance (%)	±20 (120Hz/20°C)			
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.10	0.10	0.10	0.10
Leakage current (L.C.) (μA/after 2min.) (MAX.)	CV≤1000	0.03CV+15		
	CV>1000	0.02CV+25		
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	3	3	3
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	5	5	5
Endurance 105°C	Test	φ8 : 1000hrs., φ10 to φ18 : 2000hrs.		
	ΔC/C	Within ±20% of the initial value		
rated voltage applied (With the rated ripple current)	tanδ	≤ Twice the initial specified value		
	L.C.	≤ The initial specified value		

### Dimensions



### Size List, Impedance, Rated Ripple Current

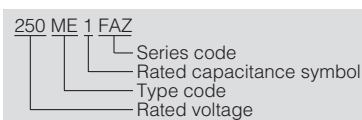
μF	160		180		200			250				
	Case size	Impedance	Case size	Impedance	Case size	Impedance	Case size	Impedance	Rated ripple current			
1.0					8 x 11.5	6.30	56	8 x 11.5	4.83	64		
2.2					8 x 11.5	4.65	79	8 x 11.5	3.93	86		
3.3	8 x 11.5	3.12	106	8 x 11.5	3.12	106	8 x 11.5	3.12	106	8 x 11.5	3.29	116
4.7	8 x 11.5	2.58	117	8 x 11.5	2.58	117	8 x 12.5	1.65	151	10 x 12.5	1.89	160
10	8 x 12.5	2.05	212	8 x 12.5	2.05	212	10 x 12.5	1.24	233	10 x 16	1.32	253
22	10 x 16	0.96	389	10 x 16	0.96	389	10 x 20	0.85	423	12.5 x 20	0.58	440
33	10 x 20	0.54	515	10 x 20	0.54	515	12.5 x 20	0.50	530	12.5 x 25	0.54	546
47	12.5 x 20	0.41	638	12.5 x 20	0.41	638	12.5 x 25	0.38	659	16 x 25	0.39	665
100	16 x 25	0.24	728	16 x 25	0.24	728	16 x 30	0.17	740	16 x 35.5	0.17	751
150	16 x 30	0.13	844	16 x 35.5	0.12	892	18 x 35.5	0.12	917	18 x 35.5	0.12	955
220	16 x 35.5	0.11	1113	18 x 35.5	0.10	1134						

Case size : φD x L (mm)

Rated ripple current  
mAr.m.s. (100kHz, 105°C)

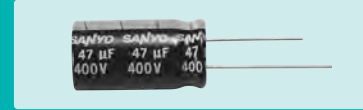
Impedance (Ω)  
MAX. at 100kHz, 20°C

Model No.



## ME-FH Series

105°C, Miniature, Long Life  
Mid. and High Voltage

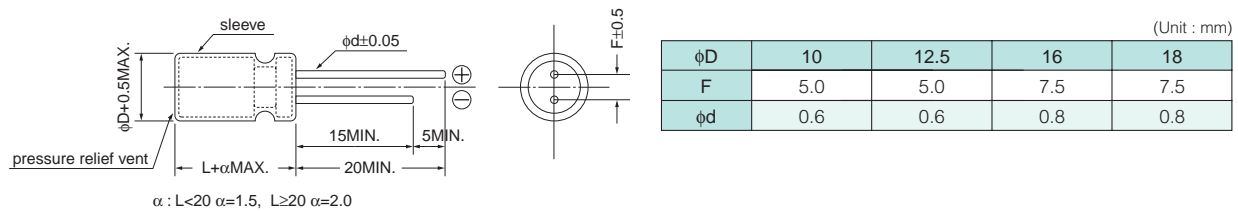


- 105°C, 10000hrs. •160V, newly added
- Do not clean the capacitors using solvent.

### Specifications

Items	Specifications						
Rated voltage (V)	160	200	250	350	400	450	
Category temperature range (°C)	-40 to +105					-25 to +105	
Capacitance tolerance (%)	±20					(120Hz/20°C)	
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.20	0.20	0.20	0.25	0.25	0.25	
Leakage current (L.C.) (μA/after 2min.) (MAX.)	0.02CV +25						
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	3	3	3	4	6	6
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	6	6	6	8	10	—
Endurance 105°C, 10000hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ±20% of the initial value					
	tanδ	≤ Twice the initial specified value					
	L.C.	≤ The initial specified value					

### Dimensions



### Size List, Rated Ripple Current

μF	160		200		250		350		400		450	
	6.8											10 x 20
10					10 x 16	106	10 x 16	100	10 x 20	108	12.5 x 20	145
22			10 x 16	173	10 x 20	184	12.5 x 20	184	12.5 x 25	195	16 x 25	218
33	10 x 16	190	10 x 20	227	12.5 x 20	238	12.5 x 25	224	16 x 25	249	16 x 31.5	243
47	10 x 20	270	12.5 x 20	270	12.5 x 25	282	16 x 25	282	16 x 31.5	292	18 x 31.5	304
68	12.5 x 20	336	12.5 x 20	325	16 x 25	364	16 x 31.5	334	18 x 31.5	346		
82	12.5 x 20	346	12.5 x 25	370	16 x 25	403	18 x 31.5	360				
100	12.5 x 25	410	16 x 25	436	16 x 31.5	418						
150	16 x 25	500	16 x 31.5	470	18 x 31.5	545						
220	16 x 31.5	570	18 x 31.5	660								

Model No. 200 ME 33 FH  
 — Series code  
 — Rated capacitance symbol  
 — Type code  
 — Rated voltage

Case size ; φD x L (mm)

Rated ripple current  
mA r.m.s. (120Hz, 105°C)

## ME-UWN Series

Bi-polar

5mm Height

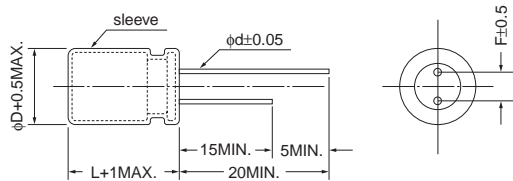


- 85°C, 1000hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +85					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.24	0.22	0.20	0.20	0.20	0.18
Leakage current (L.C.) (μA/after 1min.) (MAX.)		0.03CV+6					
Endurance 500hrs.x 2 (alternately) 85°C, rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value					
	tanδ	≤ Twice the initial specified value					
	L.C.	≤ The initial specified value					

### Dimensions



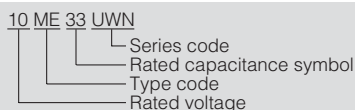
(Unit : mm)

φD	4	5	6.3
F	1.5	2.0	2.5
φd	0.45	0.45	0.45

### Size List, Rated Ripple Current

V	6.3		10		16		25		35		50	
0.10											4 x 5	1.0
0.22											4 x 5	2.3
0.33											4 x 5	3.5
0.47											4 x 5	5.0
1.0											4 x 5	10
2.2									4 x 5	8.4	5 x 5	15
3.3							4 x 5	10	5 x 5	17	5 x 5	18
4.7					4 x 5	12	5 x 5	19	5 x 5	20	6.3 x 5	23
10			4 x 5	17	5 x 5	25	6.3 x 5	28	6.3 x 5	30		
22	5 x 5	31	6.3 x 5	35	6.3 x 5	39						
33	6.3 x 5	39	6.3 x 5	43								
47	6.3 x 5	47										

Model No.



Case size ; φD x L (mm)

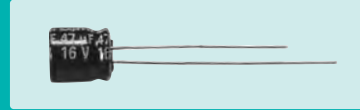
Rated ripple current  
mAr.m.s. (120Hz, 85°C)



## ME-SWN Series

Bi-polar

7mm Height

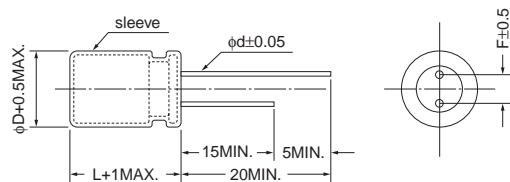


- 85°C, 1000hrs.
- Solvent proof (within 3 minutes)

### Specifications

Items		Specifications					
Rated voltage (V)		6.3	10	16	25	35	50
Category temperature range (°C)		-40 to +85					
Capacitance tolerance (%)		±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.24	0.22	0.20	0.18	0.16	0.16
Leakage current (L.C.) (μA/after 1min.) (MAX.)		0.03CV+6					
Endurance 500hrs.x2 (alternately) 85°C, rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value					
	tanδ	≤ Twice the initial specified value					
	L.C.	≤ The initial specified value					

### Dimensions



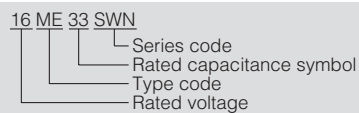
(Unit : mm)

φD	4	5	6.3
F	1.5	2.0	2.5
φd	0.45	0.45	0.45

### Size List, Rated Ripple Current

μF \ V	6.3		10		16		25		35		50	
0.10											4 x 7	1.0
0.22											4 x 7	2.3
0.33											4 x 7	3.5
0.47											4 x 7	5.0
1.0											4 x 7	10
2.2									4 x 7	10	5 x 7	15
3.3							4 x 7	16	5 x 7	17	5 x 7	18
4.7							4 x 7	19	5 x 7	20	6.3 x 7	23
10			4 x 7	17	4 x 7	25	5 x 7	28	6.3 x 7	30	6.3 x 7	34
22	5 x 7	31	5 x 7	35	6.3 x 7	39	6.3 x 7	52				
33	5 x 7	39	6.3 x 7	43	6.3 x 7	57						
47	6.3 x 7	47	6.3 x 7	59	6.3 x 7	68						

Model No.



Case size ; φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 85°C)

## ME-HWN Series

Bi-polar

Miniature

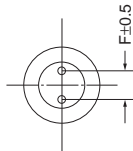
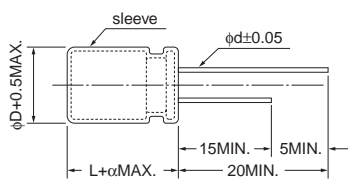


- 85°C, 2000hrs.
- Solvent proof (within 5 minutes)

### Specifications

Items	Specifications							
Rated voltage (V)	6.3	10	16	25	35	50	100	
Category temperature range (°C)	-40 to +85							
Capacitance tolerance (%)	±20 (120Hz/20°C)							
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.24	0.20	0.18	0.16	0.14	0.13	0.10	
	When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.							
Leakage current (L.C.) (μA/after 1min.) (MAX.)	0.03CV+6							
Impedance (120Hz) ratio at low temperature (MAX.)	Z-25°C/Z20°C	4	3	3	2	2	2	2
	Z-40°C/Z20°C	10	8	8	6	4	4	4
Endurance 500hrs.x4 (alternately) 85°C, rated voltage applied (With the rated ripple current)	ΔC/C	Within ±25% of the initial value						
	tanδ	≤ Twice the initial specified value						
	L.C.	≤ The initial specified value						

### Dimensions



(Unit : mm)

	5	6.3	8	10	12.5
φD	5	6.3	8	10	12.5
F	2.0	2.5	3.5	5.0	5.0
φd	0.5	0.5	0.6	0.6	0.6

α : L<20 α=1.5, L≥20 α=2.0

A pressure relief vent is attached to products over φD=6.3

### Size List, Rated Ripple Current

μF	6.3		10		16		25		35		50		100	
	V	Case	V	Case	V	Case	V	Case	V	Case	V	Case	V	Case
0.47											5 x 11	5.0	5 x 11	8.0
1.0											5 x 11	10	5 x 11	15
2.2											5 x 11	20	5 x 11	25
3.3											5 x 11	28	6.3 x 11	30
4.7							5 x 11	25	5 x 11	30	5 x 11	38	6.3 x 11	45
10					5 x 11	28	5 x 11	40	5 x 11	45	6.3 x 11	50	8 x 12.5	70
22			5 x 11	38	5 x 11	50	5 x 11	60	6.3 x 11	75	6.3 x 11	90	10 x 16	120
33	5 x 11	50	5 x 11	58	5 x 11	60	6.3 x 11	80	6.3 x 11	90	8 x 11.5	110	10 x 20	170
47	5 x 11	60	5 x 11	70	6.3 x 11	85	6.3 x 11	90	8 x 11.5	125	10 x 12.5	135	12.5 x 20	200
100	6.3 x 11	120	6.3 x 11	125	8 x 11.5	165	8 x 12.5	180	10 x 12.5	200	10 x 20	250		
220	8 x 11.5	210	8 x 12.5	225	10 x 12.5	260	10 x 16	320	10 x 20	350	12.5 x 25	410		
330	8 x 11.5	260	10 x 12.5	295	10 x 16	360	10 x 20	425	12.5 x 20	440				
470	10 x 12.5	330	10 x 16	390	10 x 20	420	12.5 x 20	540	12.5 x 25	585				
1000	10 x 20	560	12.5 x 20	620	12.5 x 25	740								
2200	12.5 x 25	890												

Model No. 50 ME 1 HWN  
 Series code  
 Rated capacitance symbol  
 Type code  
 Rated voltage

Case size ; φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 85°C)

## CE-PX Series 125°C



- 125°C, 1500hrs.
- Solvent proof (within 2 minutes)

### Specifications

Items	Specifications					
Rated voltage (V)	6.3	10	16	25	35	50
Category temperature range (°C)	-40 to +125					
Capacitance tolerance (%)	±20 (120Hz/20°C)					
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)	0.30	0.24	0.20	0.16	0.14	0.14
Leakage current (L.C.) (μA/after 2min.) (MAX.)	0.01CV					
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-25°C</sub> /Z <sub>20°C</sub>	4	3	2	2	2
	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	8	6	4	4	3
Endurance 125°C, 1500hrs. rated voltage applied (With the rated ripple current)	ΔC/C	Within ± 25% of the initial value				
	tanδ	≤ 3 times the initial specified value				
	L.C.	≤ The initial specified value				

### Marking, Dimensions

**φD≤10**  
Polarity (Cathode)  
Lot No.  
Nominal Capacitance  
Series Symbol → P  
Rated Voltage(6.3V → 6)

**φD≥12.5**  
Polarity (Cathode)  
Lot No.  
Nominal Capacitance  
Series Symbol → P  
Rated Voltage(6.3V → 6)

(Unit : mm)

D <sup>+0.5MAX.</sup>	L <sup>+0.3</sup>	W <sup>+0.2</sup>	H <sup>+0.2</sup>	C <sup>+0.2</sup>	R	P <sup>+0.2</sup>
8	10.2	8.3	8.3	9.0	0.7 to 1.0	3.2
10	10.2	10.3	10.3	11.0	1.1 to 1.4	4.6
12.5	13.5 <sup>+0.5</sup>	12.8	12.8	13.5	1.1 to 1.4	4.6

### Size List, Rated Ripple Current

μF \ V	6.3	10	16	25	35	50
33						8 x 10.2   100
47					8 x 10.2   110	10 x 10.2   160
100				8 x 10.2   110	10 x 10.2   190	12.5 x 13.5   210
150					12.5 x 13.5   250	
220			8 x 10.2   120	10 x 10.2   200	12.5 x 13.5   260	12.5 x 13.5   220
330		8 x 10.2   120	10 x 10.2   210	12.5 x 13.5   290		
470	8 x 10.2   140	10 x 10.2   210	12.5 x 13.5   300			
680	10 x 10.2   210	12.5 x 13.5   300	12.5 x 13.5   300			
1000	12.5 x 13.5   330	12.5 x 13.5   320				
1500	12.5 x 13.5   350					

Model No. **16 CE 220 PX**

- 16: Rated voltage
- CE: Series code
- 220: Rated capacitance symbol
- PX: Type code

Case size ; φD x L (mm)

Rated ripple current  
mAr.m.s. (120Hz, 125°C)

## ME-FZ Series

Long Life  
Low Impedance, High Performance

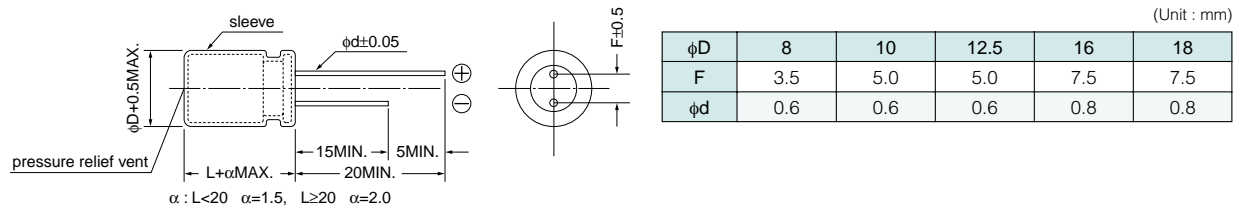


- 105°C, 5000 to 10000hrs.
- Solvent proof (within 5 minutes)

### Specifications

Items		Specifications				
Rated voltage (V)		10	16	25	35	50
Category temperature range (°C)		-55 to +105				
Capacitance tolerance (%)		±20 (120Hz/20°C)				
Tangent of loss angle (tanδ) (MAX.) (120Hz/20°C)		0.20	0.16	0.14	0.12	0.10
		When rated capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.				
Leakage current (L.C.) (μA/after 2min.) (MAX.)		The greater value of either 0.01CV or 3				
Impedance (120Hz) ratio at low temperature (MAX.)	Z <sub>-40°C</sub> /Z <sub>20°C</sub>	2	2	2	2	2
	Z <sub>-55°C</sub> /Z <sub>20°C</sub>	4	4	3	3	3
Endurance 105°C rated voltage applied (With the rated ripple current)	Test	φ8 to φ10 : 5000hrs., φ12.5 to φ18 : 10000hrs.				
	ΔC/C	Within ±25% of the initial value				
	tanδ	≤ Twice the initial specified value				
	L.C.	≤ The initial specified value				

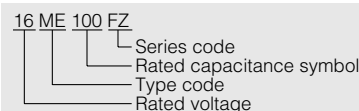
### Dimensions



### Size List, Impedance, Rated Ripple Current

V	10			16			25			35			50		
	Case size φD x L (mm)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)	Case size φD x L (mm)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)	Case size φD x L (mm)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)	Case size φD x L (mm)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)	Case size φD x L (mm)	Impedance (ΩMAX.) (20°C/100kHz)	Ripple current (mAr.m.s.) (105°C/100kHz)
10													8x11.5	0.77	180
22													8x11.5	0.51	230
33										8x11.5	0.47	240	10x12.5	0.30	390
47							8x11.5	0.43	250	8x12.5	0.43	260	10x16	0.24	540
100				8x11.5	0.43	250	10x12.5	0.28	400	10x16	0.26	470	12.5x20	0.13	880
220	8x12.5	0.32	380	10x12.5	0.26	420	10x20	0.17	560	12.5x20	0.14	720	16x25	0.060	1250
330	10x12.5	0.26	500	10x20	0.19	550	10x20	0.15	630	12.5x25	0.094	950	16x25	0.051	1400
470	10x16	0.15	600	10x20	0.13	700	12.5x25	0.068	900	16x25	0.060	1300	16x30	0.043	1500
1000	12.5x20	0.085	1000	12.5x25	0.051	1100	16x25	0.051	1350	16x30	0.043	1500			
2200	16x25	0.051	1450	16x30	0.043	1600	18x35.5	0.034	1800						
3300	16x30	0.038	1700	18x35.5	0.034	1900									
4700	18x35.5	0.034	2050												

Model No.





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