

CapXon

RoHS Compliant



**Conductive Polymer
Aluminum Solid Capacitor**

导电高分子型固态铝电解电容器

[HTTP://WWW.CAPXONGROUP.COM](http://www.capxongroup.com)

CapXon

History

- 1980 Capxon Electronic Ind. Co., Ltd. established with manufacturing aluminum electrolytic capacitor.
- 1985 Bought a new building in Shi Chih Town, and started to invest automatic manufacturing machines.
- 1991 Pushed new products development and whole line automatic.
- 1993 Established Capxon Electronic (Shen Zhen) Co., Ltd. in Shen Zhen City, Guang Dong, China.
- 1995 ISO-9002 certification both in Taiwan Factory (No. 5437) and Shen Zhen Factory. (No.5969)
- 1996 Shen Zhen Factory increased manufacturing area to 10,000 m².
- 1997 Cooperated with Capxon Electronic Technology (Ren Hua) Co., Ltd. to be a partner for Aluminum foil formed in Ren Hua, China.
- 1998 Cooperated with Hill Source Electronic Co., Ltd. for lead wire in Shen Zhen, China.
- 1999 ISO-9001 certification in Shen Zhen Factory. (No.61316.).
- 2001 Started to produce SMD E. Cap. in Taiwan Factory.
ISO-9001 certification in Taiwan Factory, (No. 0101-2001-AQ-RGA-RvA.)
Established Capxon Electronic (Shen-Zhen) Co., Ltd-Su-Zhou Branch in Su Zhou City, Jiangsu, China.
- 2002 Shen Zhen Factory increased to 105,000 m².
Cooperated with Yichang Fengshuo Equipment Co., Ltd. for foil machine in Yichang City, Huhei, China.
Cooperated with Capxon Electronic Technology (Yichang Sanxia) Co., Ltd. for foil formed/etched in Yichang City, Hubei, China.
- 2003 Established Capxon Electronic (Shen-Zhen) Co., Ltd-Tian-Jin Branch in Tian-Jin City, China.
- 2003 Got the Award of "Best Supplier" from LG.
- 2004 ISO-14001 certification in Shen Zhen Factory. (No.01404E10006R0S)
- 2004 Earned the "SQCI Certificate" from Sumsung, to be the only one capacitor vender in Taiwan.
- 2005 2Q Set up V-chip and screw terminal production line in Shen Zhen Factory.
- 2006 Mass Production of Conductive Polymer Aluminum Electrolytic Capacitor
- 2007 Listed on Hong Kong Stock Exchange

Quality Policy

We adhere to the tenet of "QUALITY FIRST", and offering satisfy product and service to the customer.

General Information

Established:	June 5, 1980	November 13, 1993
Capital:	NT\$600,000,000 (US\$19,354,839)	NT\$635,800,000 (US\$19,350,000)
	Taipei, Taiwan	Mainland China
Building:	2500M ²	105,000M ²
Employees	QA = 10	300
	ENG = 5	108
	Other = 45	2360
	Total = 60	2768

Main Products: Aluminum Electrolytic Capacitor

Aluminum Solid Capacitors With Conductive Polymer

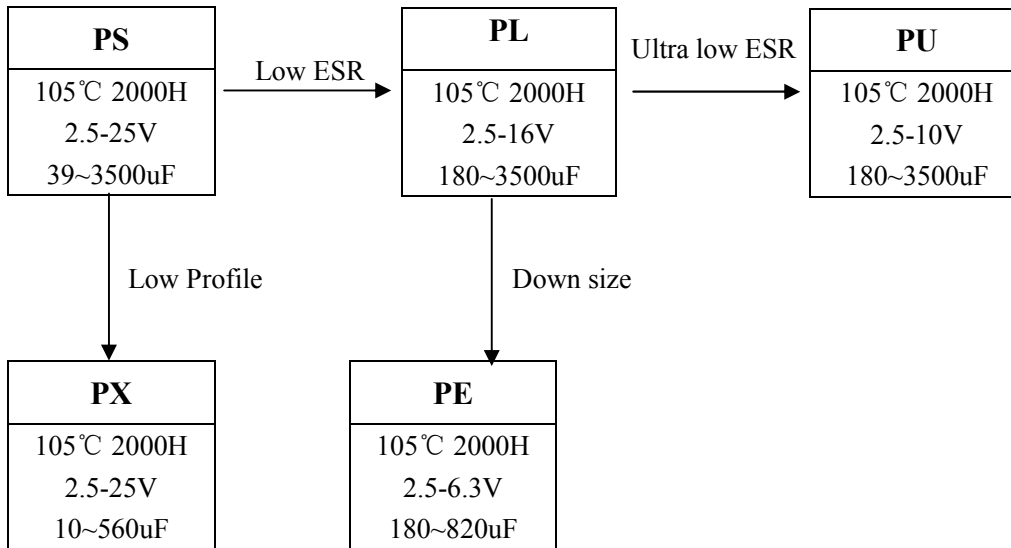
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Note : 1. Specification and dimensions in this catalog are subject to change without notice.
 If necessary, drawing can be provided.
 2. Catalog printed in Aug. 2008

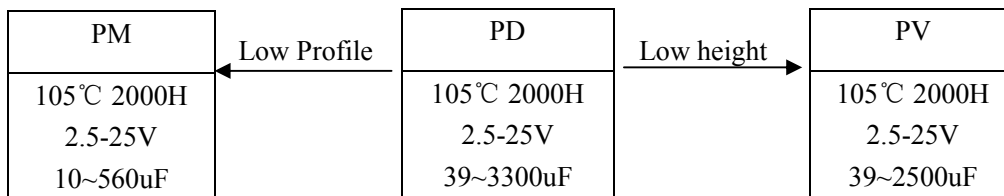
CapXon List of the Solid Capacitors

	Series Sleeve Color	Type	Features	Operating Temperature Range	Working Voltage	Capacitance	Leakage Current (max)	Load Life /Hrs	page
Conductive Polymer Electrolyte	PL	Radial	Very low ESR	-55 to +105°C	2.5-16V	180~3500uF	0.2CV	2000	16
	PS	Radial	Standard	-55 to +105°C	2.5-25V	39~3500uF	0.2CV	2000	19
	PU	Radial	Ultra low ESR	-55 to +105°C	2.5-10V	180~3500uF	0.2CV	2000	22
	PX	Radial	Low profile	-55 to +105°C	2.5-25V	10~560uF	300uA	2000	25
	PE	Radial	Low ESR & down size	-55 to +105°C	2.5-16V	180~820uF	0.2CV	2000	28
	PM	SMD	SMD and Low profile	-55 to +105°C	2.5-25V	10~560uF	300uA	2000	29
	PD	SMD	SMD and Large capacitance	-55 to +105°C	2.5-25V	39~3300uF	0.2CV	2000	32
	PV	SMD	SMD and Low height	-55 to +105°C	2.5-25V	39~2500uF	0.2CV	2000	35

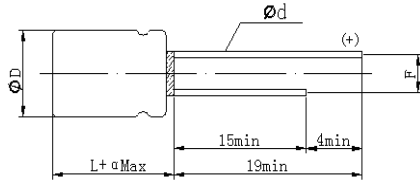
Conductive Polymer AL.E. Capacitors Radial type



Conductive Polymer AL.E. Capacitors SMD type



CapXon Cutting and Forming for Solid Capacitors



Dφ	4	5	6.3	8	10
F	1.5	2	2.5	3.5	5
dφ	0.45	0.45	0.45	0.60	0.60

(1) C F

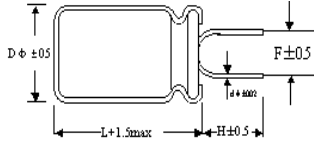


Fig1

Dφ	4	5
F	2	2.5

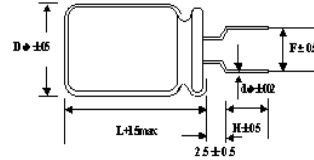
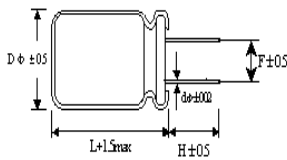


Fig2

Dφ	4	4	4	5	5	6.3	6.3	8	10
F	2.5	3.5	5	3.5	5	3.5	5	5	7.5

(2) C A



Dφ	4	5	6.3	8	10
F	1.5	2.0	2.5	3.5	5.0

(3) F A

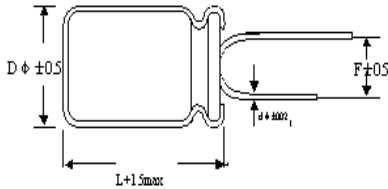


Fig1

Dφ	4	5
F	2	2.5

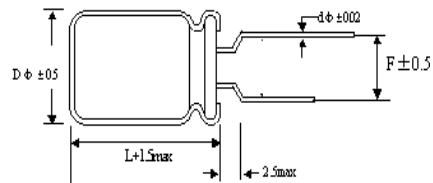
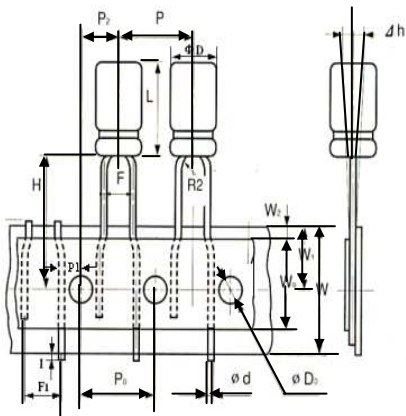
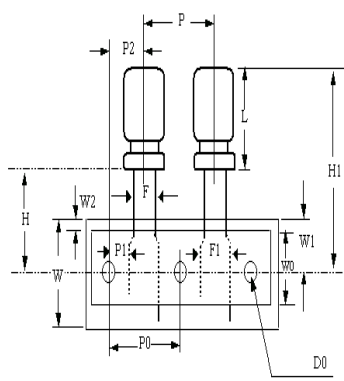


Fig2

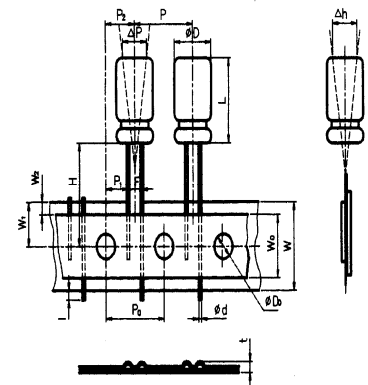
Dφ	4	4	4	5	5	6.3	6.3	8	10
F	2.5	3.5	5	3.5	5	3.5	5	5	7.5



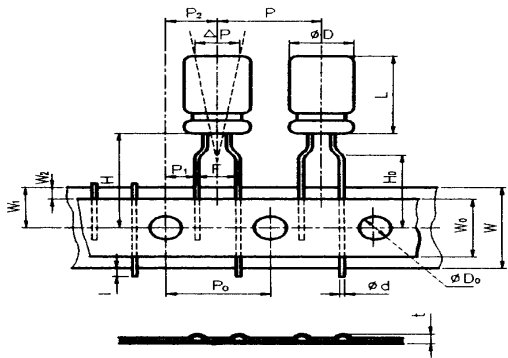
T - 1



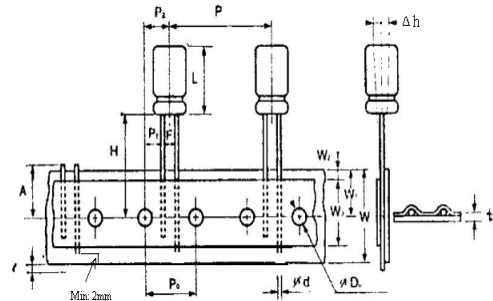
T - 2



T - 3



T - 4



T - 5

Code	D	L	d	P	P0	P1	P2	F	F1	W	W0	W1	W2	H	D0	I	Δh	Fig
Tol.	±0.5	Max	±0.02	±1.0	±0.2	±0.7	±1.3	0.4	0.5	±0.5	Min	±0.5	Max	0.75	±0.2	Max	Max	Fig
								-0.2						-0.5				
Item	3	5(+1)	0.4	12.7	12.7	4.6	6.35	2.0	3.5	18	11	9	1.5	18.5	4.1	0	1	T-1
					2.5													
	4	5-7(+1)	0.45	12.7	12.7	4.6	6.35	2.0	3.5	18	11	9	1.5	18.5	4.1	0	1	
5	5-7(+1)	0.45	12.7	12.7	4.6	6.35	2.5	3.5	18	11	9	1.5	18.5	4.1	0	1	T-1	
		0.5																

Code	D	L	d	P	P0	P1	P2	F	F1	W	W0	W1	W2	H	D0	Δh	Fig
Tol.	±0.5	Max	±0.02	±1.0	±0.2	±0.7	±1.3	0.4	0.5	±0.5	Min	±0.5	Max	0.75	±0.2	Max	Fig
								-0.2						-0.5			
Item	5	5-7(+1)	0.45	12.7	12.7	4.6	6.35	2.0	3.5	18	11	9	1.5	18.5	4.1	1	T-2
		9-15(+1.5)	0.5														
	6.3	5(+1)	0.45	12.7	12.7	4.6	6.35	2.5	3.5	18	11	9	1.5	18.5	4.1	1	
		7(+1)	0.45														
		9-15(+1.5)	0.6														

Code	D	L	d	P	P0	P1	P2	F	W	W0	W1	W2	H	D0	△h	△P	t	Fig
Tol.	±0.5	Max	±0.02	±1.0	±0.2	±0.7	±1.3	0.4	±0.5	Min	±0.5	Max	0.75	±0.2	Max	Max	±0.3	
								-0.2					-0.5					
Item	8	5-7(+1)	0.5	12.7	12.7	4.6	6.35	3.5	18	12	9	1.5	18.5	4.1	1	—	0.6	T-3
		9-20(+1.5)	0.6															
	10	9-30(+1.5)	0.6	12.7	12.7	3.85	6.35	5.0	18	12	9	1.5	18.5	4.1	1	—	0.6	
13	13-40	0.6	12.7	12.7	3.85	6.35	5.0	18	15	9	1.5	18.5	4.1	2	—	0.8		

Code	D	L	d	P	P0	P1	P2	F	W	W0	W1	W2	H	H0	D0	△h	△P	t	Fig
Tol.	±0.5	Max	±0.02	±1.0	±0.2	±0.3	±1.0	0.4	±0.5	Min	±0.5	Max	0.75	±0.5	±0.2	Max	Max	±0.3	
								-0.2					-0.5						
Item	3	5(+1)	0.4	12.7	12.7	3.85	6.35	5.0	18	11	9	1.5	18.5	16	4.1	1	1	0.6	T-4
	4	5-7(+1)	0.45	12.7	12.7	3.85	6.35	5.0	18	11	9	1.5	18.5	16	4.1	1	1	0.6	
	5	5-7(+1)	0.45	12.7	12.7	3.85	6.35	5.0	18	11	9	1.5	18.5	16	4.1	1	1	0.6	
		9-15(+1.5)	0.45																
	6.3	5(+1)	0.45	12.7	12.7	3.85	6.35	5.0	18	11	9	1.5	18.5	16	4.1	1	1	0.6	
		7(+1)	0.45																
		9-15(+1.5)	0.6																
	8	5-7(+1)	0.5	12.7	12.7	3.85	6.35	5.0	18	12	9	1.5	18.5	16	4.1	1	1	0.6	
9-20(+1.5)		0.6																	

Code	D	L	d	P	P0	P1	P2	F	W	W0	W1	W2	H	D0	△h	t	l	Fig
Tol.	±0.5	+1.5Max	±0.02	±1.0	±0.2	±0.7	±1.3	0.4	±0.5	Min	±0.5	Max	+0.75	±0.2	Max	±0.3	Min	
								-0.2					-0.5					
13	13~40	0.6	25.4	12.7	3.85	6.35	5.0	18	15	9	1.5	18.5	4.1	2	0.8	1		T-5
16	16~40	0.8	30	15	3.75	7.5	7.5	18	15	9	2	18.5	4.1	2	0.8	1		

c o d e

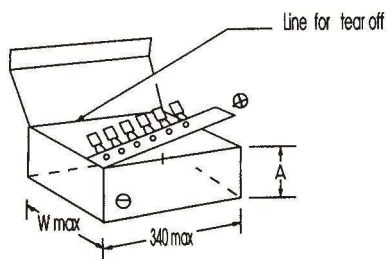
F	5.0	2.0	2.5	3.5	7.5
Code	TA	TB	TC	TD	TE

CapXon Taping Package for Solid Capacitors

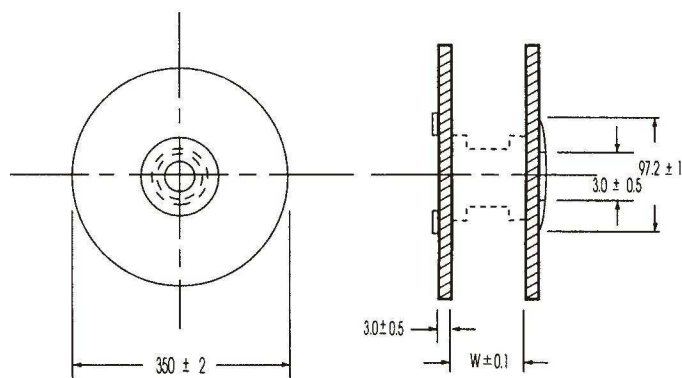
Package Information

Case Diameter ϕD (mm)	Ammo Package			Reel Package	
	W	A	Q'ty Pcs	W	Q'ty Pcs
$\Phi 4$	218	50	2500	44	1800
$\Phi 5$	285	50	2000	44	1300
$\Phi 6.3$	285	50	1500	44	1000
$\Phi 8$	240	50	800	44	800
$\Phi 10$	300	55	500	44	600

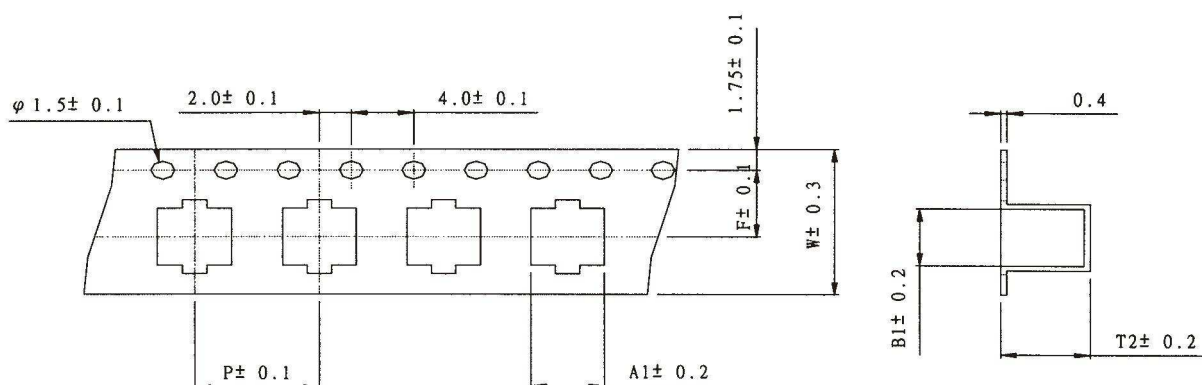
Ammo Package



Reel Package

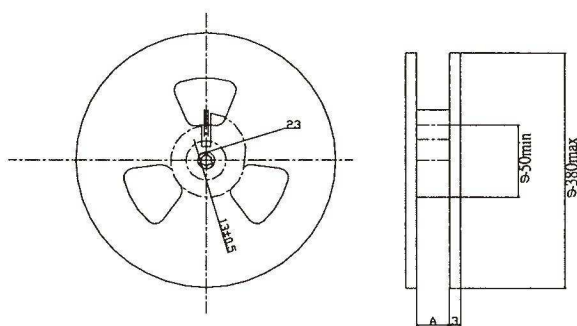


Carrier tape



$\phi D \times L$	4x5.5	5x5.5	6.3x5.8	6.3x7.7	8x7.7	8x10.5	8x11.7	10x7.7	10x10.5	10x12.4
W	12.0	12.0	16.0	16.0	16.0	24.0	24.0	24.0	24.0	24.0
P	8.0	12.0	12.0	12.0	12.0	16.0	16.0	16.0	16.0	16.0
F	5.5	5.5	7.5	7.5	7.5	11.5	11.5	11.5	11.5	11.5
A1	4.7	5.7	7.0	7.0	8.7	8.7	8.7	10.7	10.7	10.7
B1	4.7	5.7	7.0	7.0	8.7	8.7	8.7	10.7	10.7	10.7
T2	5.7	5.7	5.7	8.2	8.2	11.0	12.2	8.2	11.0	12.9

Real



ϕD	4	5	6.3,8	8,10
A	14	14	18	26

Quantity

$\phi D \times L$	Q'ty / Reel
4x5.5	2000PCS
5x5.5	1000PCS
6.3x5.8	1000PCS
6.3x7.7	900PCS
8x7.7	700PCS
8x10.5	500PCS
8x11.7	400PCS
10x7.7	700PCS
10x10.5	500PCS
10x12.4	400PCS

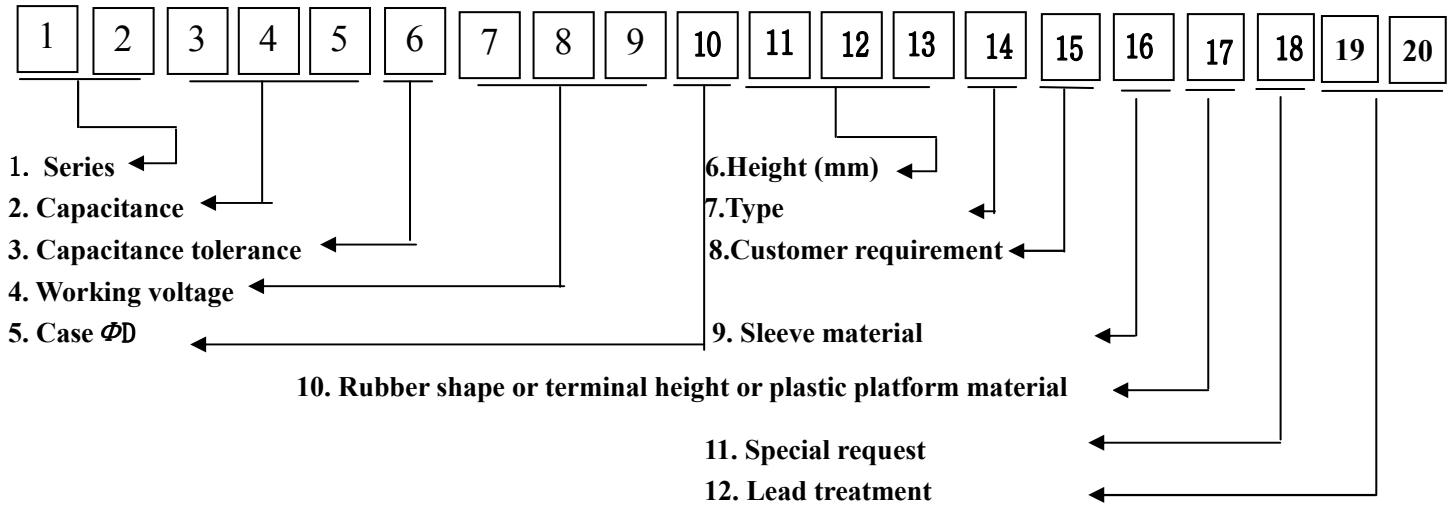
Code

F	5	2	2.5	3.5	7.5
Code	RA	RB	RC	RD	RE

CapXon Part Number System for Solid Capacitors

When placing an order for aluminum electrolytic capacitors, please observe following catalog

Part Number format that describes.



(1) Series

For the details, please refer to “List of the Products” on page 3

(2) Capacitance

Capacitance is shown in microfarads (uF)

µF	0.1	0.47	1	4.7	10	100	1000	10000
Code	OR1	R47	010	4R7	100	101	102	103

(3) Capacitance tolerance

Tolerance%	±5	±10	±20	±30	-10to+30	-10to+50	-10to+20	-10to100	0to+20	-30to+0	±15
Code	H	K	M	N	Q	T	V	W	Z	U	S
Tolerance%	0to+30	0to+40	0to+50	-5to+20	-8to+5	+5to+20	0to-20	-15to+20	-25to+85	-50to+0	-5to+30
Code	Y	X	A	J	E	I	B	P	L	O	C

(4) Working voltage (W. V)

Voltage (W. V)	2.5	4	6.3	10	16	20	23	25
Code	2R5	004	6R3	010	016	020	023	025

(5) Case (ØD)

Diameter	3	4	5	6.3	8	10
Code	A	B	C	E	F	G

(6) Height (L:mm)

Description	5	5.2	5.5	5.8	7	7.7	8	10	10.5	11	11.5	11.7	12	12.4	12.5
Code	050	052	055	058	070	077	080	010	105	110	115	117	120	124	125

(7) Type

Type	SMD	Polymer	Radial	Snap-in	Screw
Code	R	P	A		

(8) The fifteenth code: to classify the products according to the customer require, namely, 1~9

CapXon Part Number System for Solid Capacitors

(9) Sleeve material

Sleeve material	PET	PVC	Nylon
Code	P	C	N

(10) Rubber shape or terminal height or plastic platform material

Rubber shape of radial type or plastic platform material of SMD and polymer

Type	Rubber shape of radial			Spacer Material of SMD and Polymer	
	flat shape	Gourd shape	Half-moon shape	PPS	Nylon
Code	F	C	B	S	N

★If SMD and Polymer capacitors are added plastic platforms, the shape of rubber is plane, if not, they are coded according to rubber shape of radial capacitor.

The coding of terminals' length of snap-in:

TERMINALS	3. 8MM	4MM	5MM	6MM	14MM	17MM	21MM
Code	A	B	C	D	E	F	G

(11) Special request

Description	Over voltage Vent Operation	Load life	Impedance & ESR	Ripple current	DF	LC
Code	S	L	Z	R	T	C
Description	Sleeve printing	height	Pitch	Lead wire	“K” Vent	Over 2 requests
Code	P	H	F	D	K	I

If there is no special requirement in eighteenth code, will add “0” before nineteenth code.
If there is no special requirement in nineteenth, too, it's not necessary to fill both.

(12) The nineteenth, twentieth code: Lead treatment

PRECAUTIONS AND GUIDELINES FOR CONDUCTIVE POLYMER CAPACITORS

CP-CAP is a solid aluminum capacitor with conductive polymer electrolyte. Please read the following points in order to take the most out of your **CP-CAP** capacitor.

Designing device circuits

1. Circuits where **CP-CAP** capacitors are prohibited to used

The leakage current of conductive polymer solid aluminum capacitors may vary depending on thermal stresses. Please don't use solid capacitors in the following types of circuits:

- a) High-impedance circuits that are to sustain voltages.
- b) Coupling circuits
- c) Time constant circuits

In addition to the leakage current fluctuation, capacitance may also fluctuate depending on operational temperature and humidity. The fluctuation of the capacitance may cause problem if it is used as a time constant capacitor, which is extremely sensitive to the fluctuation of the capacitance. Do not use it as a time constant capacitance.

- d) Other circuits that are significantly affected by leakage current. If you want to use 2 or more **CP-CAPs** in a series connection, please contact us before use.

2. Polarity

The **CP-CAP** is a polarized solid aluminum electrolytic capacitor. Do not apply either reverse voltages or AC voltages to the polarized capacitors, using reverse polarity may cause a short circuit. Refer to the catalog, product specifications or capacitor body to confirm the polarity prior to use.

3. Applied voltage

Do not apply DC voltages exceeding the full rated voltage. The peak voltage of superimposed AC voltages (ripple voltages) on DC voltages must not exceed the full rated voltage. While there are specifications for surge voltages exceeding the rated voltage, usage conditions apply, and continued operation for extended periods of time under such conditions cannot be guaranteed. Use the within 20% of the rated voltage for applications which may cause the reverse voltage during the transient phenomena when the power is turned off or the source is switched.

4. Ripple current

Do not apply currents in excess of the rated ripple current. The superimposition of a large ripple current increases the rate of heating within the capacitor. This may reduce the service life of the capacitor or damage the capacitor.

5. Operating temperature

Do not use the **CP-CAP** capacitor at high temperatures (temperatures exceeding the maximum temperature for the capacitor category) Use of the capacitor outside of the maximum temperature for the capacitor category may decrease the service life of the capacitor.

6. Sudden charge and discharge

Do not use the **CP-CAP** capacitor in circuits where the capacitor is repetitively charged and discharged rapidly. Repetitively charging and discharging the capacitor rapidly may reduce the capacitance or may cause damage due to internal heating. Use of a protective circuit to ensure reliability is recommended when rush currents exceed 10A or the rush current is over 10 times of allowable ripple current of **CP-CAP** .

A protection resistor(1 k Ω) must be inserted to the circuit during the charge and discharge when measuring the leakage current.

7. Failures and life-span

PRECAUTIONS AND GUIDELINES FOR CONDUCTIVE POLYMER CAPACITORS

The **CP-CAP** failure rate in use is based on the failure rate level in the specification requirements. Upper category temperature and category voltage adhere to JIS C 5003 Standard. The confidence level is 60% and the failure rate is 0.5%/1,000 hours (applied rated voltage at category temperature).

The failure modes mainly have 2 types as follows.

(1) Contingency failure

The contingency failure mainly has short circuit. The phenomenon of after short is on following.

(i) In the event a short circuit causes the current to become relatively small (less than approximately 1A for ϕ 10, less than approximately 0.5A for ϕ 8 and less than approximately 0.2A for smaller than ϕ 6.3), the **CP-CAP** itself will generate a little heat, but its appearance will not be affected even when electricity is supplied continuously. However, if the short circuit current value exceeds the mentioned values above, the temperature inside the **CP-CAP** will increase, the internal pressure is raised, rubber sealing is turned over, and odorous gas is released. In this case, keep your face and hands away from the area.

(ii) The electrolyte, electrolytic paper, sealing rubber, and plastic spacer used in the **CP-CAP** are all combustible. If an extremely large electric current flows through the capacitor after shorting, the shorted part may spark, and in a worst case scenario, may ignite. Ensure safety by fully considering the design issues described below when using this capacitor in equipment where safety is a priority.

- Increase safety by using in conjunction with a protective circuit or protective equipment.
- Install measures such as redundant circuits so that the failure of a part of the equipment will not cause unstable operation.

(2) performance characteristic and failure(life-span)

CP-CAP characteristics can possibly change (capacitance reduction and ESR increase) within the specified range in specifications when it is used in the condition of rated voltage, electric and mechanical performance. When life span exceeded the specified guarantee time of endurance and damp heat, electric characteristics might change and cause electrolyte insulation. This is called open circuit mode. It is recommended to use the capacitor at a lower temperature than the maximum temperature for the capacitor category.

8. Circuit design

Verify the following before designing the circuit:

- a) The electrical characteristics of the capacitor will vary depending on differences in temperature and frequency. Only design your after verifying the scope of these factors.
- b) When connecting two or more capacitors in parallel, ensure that the design takes current balancing into account.
- c) When two or more capacitors are connected in series, variability in applied voltage may cause over-voltage conditions. Contact CapXon before using capacitors connected in series.

9. Capacitor usage environment

Do not use/expose capacitors to the following conditions.

- a) Oil, water, salty water, take care to avoid storage in damp locations.
- b) Direct sunlight
- c) Toxic gases such as hydrogen, sulfide, sulfurous acids, nitrous acids, chlorine and chlorine compounds, bromine and bromine compounds, ammonia, etc.
- d) Ozone, ultraviolet rays and radiation.
- e) Severe vibration or mechanical shock conditions beyond the limits advised in the product specification section of the catalog.

PRECAUTIONS AND GUIDELINES FOR CONDUCTIVE POLYMER CAPACITORS

10. Capacitor mounting

- a) For the surface mount capacitor, design the copper pads on the PC board in accordance with the catalog or the product specification
- b) For radial capacitors, design the terminal holes on the PC board to fit the terminal pitch of the capacitor.

11. Leakage current

Heat pressure from soldering and mechanical stress from transportation may cause the leakage current to become large. In such a case, leakage current will gradually decrease by applying voltage less than or equal to the rated voltage at a temperature within the upper category temperature. In close conditions to the upper category temperature, the nearer the applied voltage is to the rated voltage, the faster the leakage current recovery speed is.

Mounting precautions

1. Note

- a) For the surface mount capacitor, design the copper pads on the PC board in accordance with the catalog or the product specification
- b) For radial capacitors, design the terminal holes on the PC board to fit the terminal pitch of the capacitor.
- c) Mount after checking the capacitance and the rated voltage.
- d) Mount after checking the polarity.
- e) Do not apply excessive external force to the lead terminal and the **CP-CAP** itself.
- f) Ensure that the soldering conditions meet the specifications recommended by CapXon. Note that the leakage current may increase due to thermal stresses that occur during soldering, etc. Note that increased leakage currents gradually decrease when voltage is applied.

2. Soldering using a soldering iron:

- a) The soldering conditions (temperature and time) are within the ranges specified in the catalog or product specifications.
- b) The tip of the soldering iron does not come into contact with the capacitor itself.

3. Flow soldering

- a) Do not dip the body of a capacitor into the solder bath only dip the terminals in. The soldering must be done on the reverse side of PC board.
- b) Soldering conditions (preheat, solder temperature and dipping time) should be within the limits prescribed in the catalog or the product specifications.

In regards to flow soldering, be sure to solder within the following conditions.

	Temperature	Duration	Flow number
Preheating	120°C or less (ambient temperature)	120 sec. or less	1 time
Soldering conditions	260+5°C or less	10+1 sec. or less	Twice or less

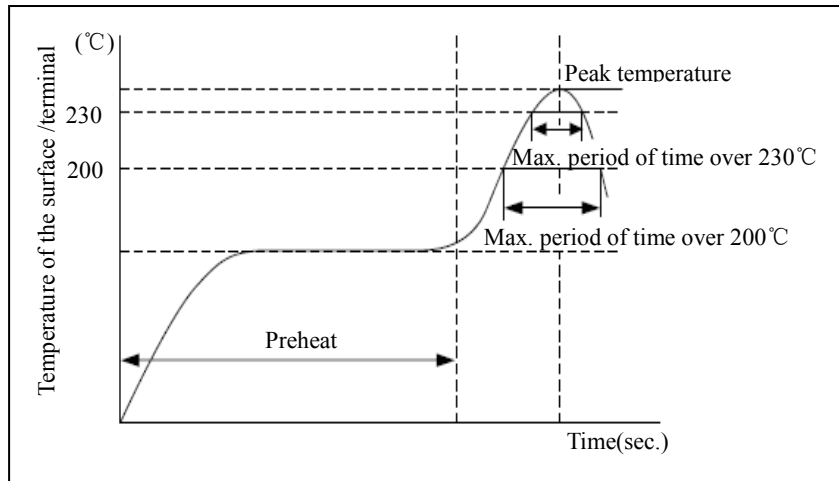
- c) Do not apply flux to any part of capacitors other than their terminals.
- d) Make sure the capacitors do not come into contact with any other components while soldering.

4. Reflow soldering

- a) Soldering conditions (preheat, solder temperature and soldering time) should be within the limits prescribed in the catalogs or the product specification.

PRECAUTIONS AND GUIDELINES FOR CONDUCTIVE POLYMER CAPACITORS

- b) The heat level should be appropriate. (Note that the thermal stress on the capacitor varies depending on the type and position of the heater in the reflow oven.)
- c) Vapor phase soldering (VPS) is not used
- d) Except for the surface mount type, reflow soldering must not be used for the capacitors.
- e) In the case of reflow soldering, capacitive static electricity may decrease after soldering even when the soldering conditions are within the required values.
- f) Recommended reflow condition of SMD type.



Voltage range	Preheat	Time maintained above 200°C	Time maintained above 230°C	Peak temp.	Reflow number
2.5 to 10v	150 to 180°C 120 sec. max.	60 sec. max.	40 sec. max.	260°Cmax	only 1 time
				250°Cmax	twice or less
16 to 25v	150 to 180°C 120 sec. max.	60 sec. max.	40 sec. max.	250°Cmax	only 1 time
				50 sec. max.	30 sec. max.

Note: All temperatures are measured on the topside of the Al-case and terminal surface.

The leakage current value may increase (from a few μ A to a few mA) even within the above conditions. When the CP-CAP is used in a DC circuit, the leakage current will decrease gradually through self-recovery after voltage is applied. If your reflow profile deviates from the above conditions for mounting the CP-CAP, please consult with CapXon.

5. Handling after soldering

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

- a) Do not lean or twist the body of the capacitor after soldering the capacitors onto the PC board
- b) Do not use the capacitors for lifting or carrying the assembly board.
- c) Do not hit or poke the capacitor after soldering to PC board. When stacking the assembly board, be careful that other components do not touch the aluminum electrolytic capacitors.
- d) Do not drop the assembled board.

6. Washing the PC boards

- a) Do not wash capacitors by using the following cleaning agents. Solvent resistant capacitors are only suitable for washing using the cleaning conditions prescribed in the catalog or the product specification. In particular, ultrasonic cleaning will accelerate damage to capacitors.

PRECAUTIONS AND GUIDELINES FOR CONDUCTIVE POLYMER CAPACITORS

- Halogenated solvents; cause capacitors to fail due to corrosion.
Alkali system solvents; corrode (dissolve) an aluminum case.
 - Petroleum system solvents; cause the rubber seal material to deteriorate.
 - Xylene; causes the rubber seal material to deteriorate.
 - Acetone; erases the markings.
- b) Verify the following points when washing capacitors.
- Monitor conductivity, pH, specific gravity and the water content of cleaning agents. Contamination adversely affects these characteristics.
 - Be sure not to expose the capacitors under solvent rich conditions or keep capacitors inside a closed container.
In addition, please dry the solvent sufficiently on the PC board and the capacitor with an air knife (temperature should be less than the maximum rated category temperature of the capacitor) for 10 minutes.
Aluminum electrolytic capacitors can be characteristically and catastrophically damaged by halogen ions, particularly by chlorine ions, though the degree of the damage mainly depends upon the characteristics of the electrolyte and rubber seal material. When halogen ions come into contact with the capacitors, the foil corrodes when a voltage is applied. This corrosion causes an extremely high leakage current which results venting and an open circuit.

Storage

The following conditions for storage are recommend.

- a) Store capacitors in a cool, dry place. Store at a temperature between 5 and 35°C, with a humidity of 75% or less.
SMD products are sealed in a special laminated aluminum bag. Use all capacitors once the bag is opened.
Return unused capacitors to the bag, and seal it with a zipper. Be sure to follow our recommendations for reflow soldering.
- b) Store the capacitors in a location free from direct contact with water, salt water, and oil.
- c) Store in a location where the capacitor is not exposed to toxic gas, such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or chlorine compounds, bromine or other halogen gases, methyl bromide or other halogen compounds, ammonia, or similar.
- d) Store in a location where the capacitor is not exposed to ozone, ultraviolet radiation, or other radiation.
- e) It is recommended to store capacitors in their original packaging wherever possible.

PL series

$ESR \leq 7m \Omega$



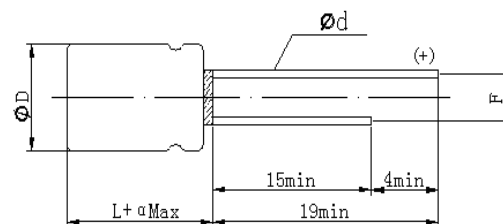
◆ Features

- Very Low ESR at high frequency range.
- Very Large permissible ripple current.
- Long life and high reliability(reliability: 0.1%/1000Hrs).

◆ Specifications

Items	Characteristics	
Operating Temp. Range	-55°C~+105°C	
Capacitance Range	180~3500 μ F	
Capacitance Tolerance	M: ±20%	
Rated Voltage Range	2.5V ~16V DC	
Dissipation Factor (at 120Hz,20°C)	Not to exceed the value specified	
Leakage Current	≤0.2CV (μ A, after 2 minutes)	
ESR (100K~300KHz)	Not to exceed the value specified	
Endurance 105°C, 2000h, at rated voltage	Capacitance	Within ±20% of the value before test
	Leakage current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified
Moisture Resistance Stored at 60°C, RH90~95%, 2000h	Capacitance	Within ±20% of the value before test
	Leakage Current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified

◆ Dimensions



Unit: mm

Φ D×L	Φ D+0.5max.	α	F	Φ d±0.05
8×8	8.0	1.0	3.5	0.6
8×11.5	8.0	1.5	3.5	0.6
10×12.5	10.0	1.5	5.0	0.6

◆ Size List

CAP	RV (SV)				
	2.5 (2.8)	4 (4.6)	6.3 (7.2)	10 (11.5)	16 (18.4)
180			8×8 / 8×11.5	8×11.5	8×11.5
220			8×8 / 8×11.5	8×11.5	8×11.5
270			8×8 / 8×11.5	8×11.5	8×11.5
330			8×8 / 8×11.5	8×11.5	8×11.5 / 10×12.5
390			8×8 / 8×11.5	8×11.5	10×12.5
470			8×8 / 8×11.5	8×11.5	10×12.5
560	8×8 / 8×11.5	8×8 / 8×11.5	8×8 / 8×11.5	8×11.5	10×12.5
680	8×8 / 8×11.5	8×8 / 8×11.5	8×11.5	10×12.5	10×12.5
820	8×8 / 8×11.5	8×8 / 8×11.5 / 10×12.5	8×11.5	10×12.5	10×12.5
1000	8×11.5	8×11.5	10×12.5	10×12.5	
1200	8×11.5	8×11.5 / 10×12.5	8×11.5 / 10×12.5		
1500	8×11.5	10×12.5	10×12.5		
2000	10×12.5	10×12.5	10×12.5		
2500	10×12.5	10×12.5			
2700	10×12.5				
3000	10×12.5				
3300	10×12.5				
3500	10×12.5				

✧ Characteristics List

W.V. (V)	Capacitance (μ F)	L.C. (μ A,2min)	tg δ (120Hz,20°C)	ESR (m Ω ,100kHz)	Maximum Permissible Ripple Current(mA,r.m.s)	Size Φ D \times L(mm)
2.5	560	280	0.08	7	5600	8 \times 8
						8 \times 11.5
	680	340	0.08	7	5600	8 \times 8
						8 \times 11.5
	820	410	0.08	7	5600	8 \times 8
						8 \times 11.5
	1000	500	0.08	7	5600	8 \times 11.5
	1200	600	0.08	7	5600	8 \times 11.5
	1500	750	0.08	7	5600	8 \times 11.5
	2000	1000	0.08	7	6100	10 \times 12.5
	2500	1250	0.08	7	6100	10 \times 12.5
	2700	1350	0.08	7	6100	10 \times 12.5
3000	1500	0.08	7	6100	10 \times 12.5	
3300	1650	0.08	7	6100	10 \times 12.5	
3500	1750	0.08	7	6100	10 \times 12.5	
4.0	560	224	0.08	7	5600	8 \times 8
						8 \times 11.5
	680	272	0.08	7	5600	8 \times 8
						8 \times 11.5
	820	328	0.08	7	5600	8 \times 8
						8 \times 11.5
					6100	10 \times 12.5
	1000	800	0.08	7	5600	8 \times 11.5
	1200	960	0.08	7	5600	8 \times 11.5
					6100	10 \times 12.5
1500	1200	0.08	7	6100	10 \times 12.5	
2000	1600	0.08	7	6100	10 \times 12.5	
2500	1500	0.08	7	6100	10 \times 12.5	
6.3	180	226.8	0.07	7	5100	8 \times 8
					5600	8 \times 11.5
	220	277	0.07	7	5100	8 \times 8
					5600	8 \times 11.5
	270	340.2	0.07	7	5100	8 \times 8
					5600	8 \times 11.5
	330	416	0.07	7	5100	8 \times 8
					5600	8 \times 11.5
	390	491.4	0.08	7	5100	8 \times 8
					5600	8 \times 11.5
	470	592	0.08	7	5600	8 \times 8
						8 \times 11.5
	560	705.6	0.08	7	5600	8 \times 8
						8 \times 11.5
	680	428	0.08	7	5600	8 \times 11.5
	820	516.6	0.10	7	5600	8 \times 11.5
1000	630	0.10	7	6100	10 \times 12.5	
1200	756	0.10	7	5600	8 \times 11.5	
				6100	10 \times 12.5	
1500	945	0.10	7	6100	10 \times 12.5	
2000	1260	0.10	7	6100	10 \times 12.5	

W.V. (V)	Capacitance (μ F)	L.C. (μ A, 2min)	tg δ (120Hz, 20°C)	ESR (m Ω , 100kHz)	Maximum Permissible Ripple Current(mA, r.m.s)	Size Φ D \times L(mm)
10	180	180	0.07	7	5600	8 \times 11.5
	220	220	0.08	7	5600	8 \times 11.5
	270	270	0.08	7	5600	8 \times 11.5
	330	330	0.08	7	5600	8 \times 11.5
	390	390	0.08	7	5600	8 \times 11.5
	470	470	0.08	7	5600	8 \times 11.5
	560	560	0.10	7	5600	8 \times 11.5
	680	680	0.10	7	6100	10 \times 12.5
	820	820	0.10	7	6100	10 \times 12.5
	1000	1000	0.10	7	6100	10 \times 12.5
16	180	288	0.08	7	5600	8 \times 11.5
	220	352	0.08	7	5600	8 \times 11.5
	270	432	0.08	7	5600	8 \times 11.5
	330	528	0.08	7	5600	8 \times 11.5
					6100	10 \times 12.5
	390	624	0.08	7	6100	10 \times 12.5
	470	752	0.10	7	6100	10 \times 12.5
	560	896	0.10	7	6100	10 \times 12.5
	680	1000	0.10	7	6100	10 \times 12.5
	820	1280	0.10	7	6100	10 \times 12.5

✧ Frequency Coefficient for Ripple Current

Frequency	120Hz \leq freq.<1KHz	1KHz \leq freq.<10KHz	10KHz \leq freq.<100KHz	100KHz \leq freq.<300KHz
Coefficient	0.05	0.3	0.7	1

✧ *CapXon is in the position to offer also customized products*

PS series

Standard Products

◆ Features

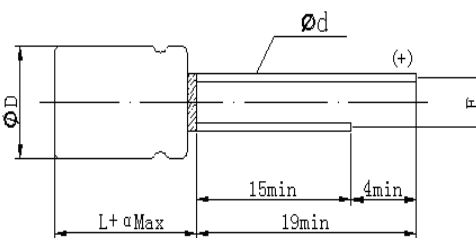
- Low ESR at high frequency range.
- Large permissible ripple current.
- Long life and high reliability(reliability: 0.1%/1000Hrs).



◆ Specifications

Items	Characteristics	
Operating Temp. Range	-55°C~+105°C	
Capacitance Range	39~3500 μ F	
Capacitance Tolerance	M: ±20%	
Rated Voltage Range	2.5V ~25V DC	
Dissipation Factor (at 120Hz,20°C)	Not to exceed the value specified	
Leakage Current	≤0.2CV (μ A, after 2 minutes)	
ESR (100K~300KHz)	Not to exceed the value specified	
Endurance 105°C, 2000h, at rated voltage	Capacitance	Within ±20% of the value before test
	Leakage current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified
Moisture Resistance Stored at 60°C, RH90~ 95%, 2000h	Capacitance	Within ±20% of the value before test
	Leakage Current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified

◆ Dimensions



Unit: mm

ΦD×L	ΦD+0.5max.	α	F	Φd±0.05
8×8	8.0	1.0	3.5	0.6
8×11.5	8.0	1.5	3.5	0.6
10×12.5	10.0	1.5	5.0	0.6

◆ Size List

CAP	RV (SV)							
	2.5 (2.8)	4 (4.6)	6.3 (7.2)	10 (11.5)	16 (18.4)	20 (23)	25 (27.5)	
39						8×11.5	8×11.5	
47						8×11.5	8×11.5	
68						8×11.5	8×11.5	
82						8×11.5	8×11.5	
100					8×11.5	10×12.5	10×12.5	
180			8×8 / 8×11.5	8×11.5	8×8 / 8×11.5	10×12.5	10×12.5	
220			8×8 / 8×11.5	8×11.5	8×11.5	10×12.5	10×12.5	
270			8×8 / 8×11.5	8×11.5	8×11.5			
330			8×8 / 8×11.5	8×11.5	8×11.5 / 10×12.5			
390			8×8 / 8×11.5	8×11.5	10×12.5			
470			8×8 / 8×11.5	8×11.5	10×12.5			
560	8×8 / 8×11.5	8×8 / 8×11.5	8×11.5	8×11.5	10×12.5			
680	8×8 / 8×11.5	8×8 / 8×11.5	8×11.5 / 10×12.5	10×12.5	10×12.5			
820	8×8 / 8×11.5	8×8 / 8×11.5	8×8 / 8×11.5 / 10×12.5	10×12.5	10×12.5			
1000	8×11.5	8×11.5	10×12.5	10×12.5				
1200	8×11.5	8×11.5 / 10×12.5	8×11.5 / 10×12.5	10×12.5				
1500	8×11.5	10×12.5	10×12.5					
2000	10×12.5	10×12.5	10×12.5					
2500	10×12.5	10×12.5						
2700	10×12.5							
3000	10×12.5							
3300	10×12.5							
3500	10×12.5							

✧ Characteristics List

W.V. (V)	Capacitance (μ F)	L.C. (μ A,2min)	tg δ (120Hz,20°C)	ESR (m Ω ,100kHz)	Maximum Permissible Ripple Current(mA,r.m.s)	Size Φ D×L(mm)
2.5	560	280	0.08	12	4800	8×8
						8×11.5
	680	340	0.08	12	5000	8×8
						8×11.5
	820	410	0.08	12	5200	8×8
						8×11.5
	1000	500	0.08	12	5200	8×11.5
	1200	600	0.08	12	5200	8×11.5
	1500	750	0.08	12	5200	8×11.5
	2000	1000	0.08	12	5500	10×12.5
	2500	1250	0.08	12	5500	10×12.5
2700	1350	0.08	12	5500	10×12.5	
3000	1500	0.08	12	5500	10×12.5	
3300	1650	0.08	12	5500	10×12.5	
3500	1750	0.10	12	5500	10×12.5	
4.0	560	224	0.08	12	5000	8×8
					5200	8×11.5
	680	272	0.08	12	5000	8×8
					5200	8×11.5
	820	328	0.08	12	5000	8×8
					5200	8×11.5
					5500	10×12.5
	1200	960	0.10	12	5200	8×11.5
				5500	10×12.5	
1500	1200	0.10	12	5500	10×12.5	
2000	1600	0.10	12	5500	10×12.5	
2500	2000	0.10	12	5500	10×12.5	
6.3	180	226.8	0.07	21	3700	8×8
					3900	8×11.5
	220	277	0.07	21	3700	8×8
					3900	8×11.5
	270	340.2	0.07	21	3700	8×8
					3900	8×11.5
	330	416	0.07	15	4300	8×8
					4500	8×11.5
	390	491	0.08	15	4300	8×8
					4500	8×11.5
	470	592	0.08	12	5000	8×8
					5200	8×11.5
	560	705.6	0.08	12	5000	8×8
					5200	8×11.5
	680	428	0.08	12	5200	8×11.5
				5500	10×12.5	
820	516.6	0.10	12	5000	8×8	
				5200	8×11.5	
				5500	10×12.5	
1000	630	0.10	12	5500	10×12.5	
1200	756	0.10	12	5200	8×11.5	
				5500	10×12.5	
1500	945	0.10	12	5500	10×12.5	
2000	1260	0.10	12	5500	10×12.5	

W.V. (V)	Capacitance (μ F)	L.C. (μ A,2min)	tg δ (120Hz,20°C)	ESR (m Ω ,100kHz)	Maximum Permissible Ripple Current(mA,r.m.s)	Size Φ D \times L(mm)
10	180	180	0.08	15	5000	8 \times 11.5
	220	220	0.08	15	5000	8 \times 11.5
	270	270	0.08	15	5000	8 \times 11.5
	330	330	0.08	12	5000	8 \times 11.5
	390	390	0.08	12	5000	8 \times 11.5
	470	470	0.08	12	5000	8 \times 11.5
	560	560	0.08	12	5000	8 \times 11.5
	680	680	0.10	12	5500	10 \times 12.5
	820	820	0.10	12	5500	10 \times 12.5
	1000	1000	0.10	12	5500	10 \times 12.5
	1200	1200	0.10	12	5500	10 \times 12.5
16	100	160	0.08	15	3900	8 \times 11.5
	180	288	0.08	15	3700	8 \times 8
					3900	8 \times 11.5
	220	352	0.08	15	3900	8 \times 11.5
	270	432	0.08	15	3900	8 \times 11.5
	330	528	0.08	12	3900	8 \times 11.5
					5500	10 \times 12.5
	390	624	0.08	12	5500	10 \times 12.5
	470	752	0.10	12	5500	10 \times 12.5
	560	896	0.10	12	5500	10 \times 12.5
	680	1000	0.10	12	5500	10 \times 12.5
820	1000	0.10	12	5500	10 \times 12.5	
20	39	156	0.08	30	3000	8 \times 11.5
	47	188	0.08	30	3000	8 \times 11.5
	68	272	0.08	25	3900	8 \times 11.5
	82	328	0.08	20	3900	8 \times 11.5
	100	400	0.08	18	4100	10 \times 12.5
	180	720	0.08	18	4100	10 \times 12.5
	220	880	0.08	18	4100	10 \times 12.5
25	39	195	0.08	25	3400	8 \times 11.5
	47	235	0.08	20	3400	8 \times 11.5
	68	340	0.08	20	3400	8 \times 11.5
	82	410	0.08	20	3400	8 \times 11.5
	100	500	0.08	20	4100	10 \times 12.5
	180	900	0.08	20	4100	10 \times 12.5
	220	1100	0.08	20	4100	10 \times 12.5

✧ Frequency Coefficient for Ripple Current

Frequency	120Hz \leq freq.<1KHz	1KHz \leq freq.<10KHz	10KHz \leq freq.<100KHz	100KHz \leq freq.<300KHz
Coefficient	0.05	0.3	0.7	1

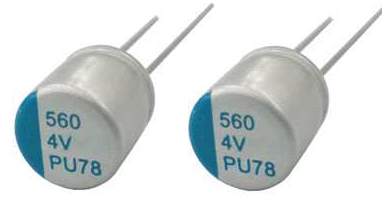
✧ CapXon is in the position to offer also customized products

PU series

$ESR \leq 6m \Omega$

✧ Features

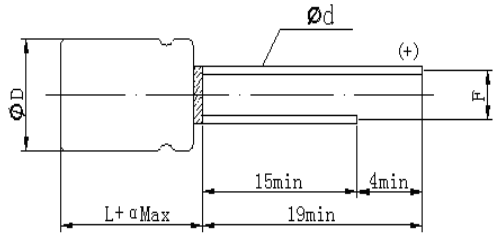
- Ultra Low ESR at high frequency range.
- Ultra Large permissible ripple current.
- Long life and high reliability(reliability: 0.1%/1000Hrs).



✧ Specifications

Items	Characteristics	
Operating Temp. Range	-55°C ~ +105°C	
Capacitance Range	39 ~ 3500 μ F	
Capacitance Tolerance	M: $\pm 20\%$	
Rated Voltage Range	2.5V ~ 25V DC	
Dissipation Factor (at 120Hz, 20°C)	Not to exceed the value specified	
Leakage Current	$\leq 0.2CV$ (μ A, after 2 minutes)	
ESR (100K~300KHz)	Not to exceed the value specified	
Endurance 105°C, 2000h, at rated voltage	Capacitance	Within $\pm 20\%$ of the value before test
	Leakage current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified
Moisture Resistance Stored at 60°C, RH90~ 95%, 2000h	Capacitance	Within $\pm 20\%$ of the value before test
	Leakage Current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified

✧ Dimensions



Unit: mm

$\Phi D \times L$	$\Phi D + 0.5max.$	α	F	$\Phi d \pm 0.05$
8×8	8.0	1.0	3.5	0.6
8×11.5	8.0	1.5	3.5	0.6
10×12.5	10.0	1.5	5.0	0.6

✧ Size List

CAP	RV (SV)	2.5 (2.8)	4 (4.6)	6.3 (7.2)	10 (11.5)
	180				8×8 / 8×11.5
220				8×8 / 8×11.5	8×11.5
270				8×8 / 8×11.5	8×11.5
330				8×8 / 8×11.5	8×11.5
390				8×8 / 8×11.5	8×11.5
470				8×8 / 8×11.5	8×11.5 / 10×12.5
560	8×8 / 8×11.5	8×8 / 8×11.5	8×8 / 8×11.5	8×8 / 8×11.5	8×11.5 / 10×12.5
680	8×8 / 8×11.5	8×8 / 8×11.5	8×11.5 / 10×12.5	8×11.5 / 10×12.5	8×11.5 / 10×12.5
820	8×8 / 8×11.5	8×11.5 / 10×12.5	8×11.5 / 10×12.5	8×11.5 / 10×12.5	10×12.5
1000	8×11.5	8×11.5	8×11.5 / 10×12.5	8×11.5 / 10×12.5	10×12.5
1200	8×11.5	8×11.5 / 10×12.5	8×11.5 / 10×12.5	8×11.5 / 10×12.5	10×12.5
1500	8×11.5 / 10×12.5	10×12.5	10×12.5	10×12.5	
2000	10×12.5	10×12.5	10×12.5	10×12.5	
2500	10×12.5	10×12.5			
2700	10×12.5				
3000	10×12.5				
3300	10×12.5				
3500	10×12.5				

✧ Characteristics List

W.V. (V)	Capacitance (μ F)	L.C. (μ A,2min)	tg δ (120Hz,20°C)	ESR (m Ω ,100kHz)	Maximum Permissible Ripple Current(mA,r.m.s)	Size Φ D \times L(mm)
2.5	560	280	0.08	6	6100	8 \times 8 8 \times 11.5
	680	340	0.08	6	6100	8 \times 8 8 \times 11.5
	820	410	0.08	6	6100	8 \times 8 8 \times 11.5
	1000	500	0.08	6	6100	8 \times 11.5
	1200	600	0.08	6	6100	8 \times 11.5
	1500	750	0.10	6	6100 7100	8 \times 11.5 10 \times 12.5
	2000	1000	0.10	6	7100	10 \times 12.5
	2500	1250	0.10	6	7100	10 \times 12.5
	2700	1350	0.10	6	7100	10 \times 12.5
	3000	1500	0.10	6	7100	10 \times 12.5
	3300	1650	0.10	6	7100	10 \times 12.5
	3500	1750	0.10	6	7100	10 \times 12.5
4.0	560	224	0.08	6	6100	8 \times 8 8 \times 11.5
	680	544	0.08	6	6100	8 \times 8 8 \times 11.5
	820	656	0.08	6	6100 6600	8 \times 11.5 10 \times 12.5
	1200	960	0.08	6	6100 6600	8 \times 11.5 10 \times 12.5
	1500	1200	0.10	6	6600	10 \times 12.5
	2000	1600	0.10	6	6600	10 \times 12.5
	2500	2000	0.10	6	6600	10 \times 12.5
	6.3	180	113.4	0.10	6	6100
220		138.6	0.10	6	6100	8 \times 8 8 \times 11.5
270		170	0.10	6	6100	8 \times 8 8 \times 11.5
330		207.9	0.10	6	6100	8 \times 8 8 \times 11.5
390		245.7	0.10	6	6100	8 \times 8 8 \times 11.5
470		296.1	0.10	6	6100	8 \times 8 8 \times 11.5
560		352	0.08	6	6100	8 \times 8 8 \times 11.5
680		428.4	0.08	6	6600	8 \times 11.5 OR 10 \times 12.5
820		516.6	0.10	6	6600	
1000		630	0.10	6	7100	
1200		756	0.10	6	7100	
1500		945	0.10	6	7100	10 \times 12.5
2000		1260	0.10	6	7100	10 \times 12.5

W.V. (V)	Capacitance (μ F)	L.C. (μ A, 2min)	$\text{tg } \delta$ (120Hz, 20°C)	ESR (m Ω , 100kHz)	Maximum Permissible Ripple Current(mA, r.m.s)	Size Φ D \times L(mm)
10	180	180	0.08	6	6600	8 \times 11.5
	220	220	0.08	6	6600	8 \times 11.5
	270	270	0.08	6	6600	8 \times 11.5
	330	330	0.08	6	6600	8 \times 11.5
	390	390	0.08	6	6600	8 \times 11.5
	470	470	0.08	6	6600	8 \times 11.5
	560	560	0.08	6	6600	OR
	680	680	0.10	6	6600	10 \times 12.5
	820	820	0.10	6	7100	10 \times 12.5
	1000	1000	0.10	6	7100	10 \times 12.5
	1200	1200	0.10	6	7100	10 \times 12.5

✧ Frequency Coefficient for Ripple Current

Frequency	120Hz \leq freq.<1KHz	1KHz \leq freq.<10KHz	10KHz \leq freq.<100KHz	100KHz \leq freq.<300KHz
Coefficient	0.05	0.3	0.7	1

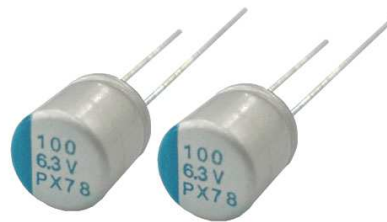
✧ *CapXon is in the position to offer also customized products*

PX series

Low Profile

◇ Features

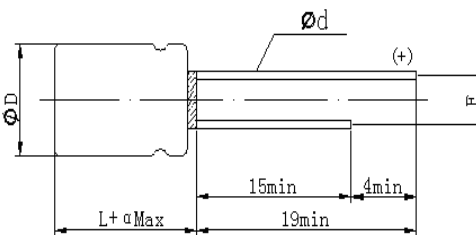
- Low profile
- Low ESR at high frequency range & Large permissible ripple current.
- Long life and high reliability(reliability: 0.1%/1000Hrs).



◇ Specifications

Items	Characteristics	
Operating Temp. Range	-55°C ~ +105°C	
Capacitance Range	10 ~ 560 μF	
Capacitance Tolerance	M: ±20%	
Rated Voltage Range	2.5V ~ 25V DC	
Dissipation Factor (at 120Hz, 20°C)	Not to exceed the value specified	
Leakage Current	Not to exceed the value specified (μA, after 2 minutes)	
ESR (100K~300KHz)	Not to exceed the value specified	
Endurance 105°C, 2000h, at rated voltage	Capacitance	Within ±20% of the value before test
	Leakage current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified
Moisture Resistance Stored at 60°C, RH90~ 95%, 2000h	Capacitance	Within ±20% of the value before test
	Leakage Current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified

◇ Dimensions



ΦD×L	ΦD+0.5max.	α	F	Unit: mm Φd±0.05
4×5	4	1.0	1.5	0.45
5×5	5	1.0	2.0	0.45
6.3×5.2	6.3	1.0	2.5	0.45
6.3×7	6.3	1.0	2.5	0.45
6.3×10	6.3	1.0	2.5	0.6

◇ Size List

CAP	RV (SV)							
	2.5 (2.8)	4 (4.6)	6.3 (7.2)	10 (11.5)	16 (18.4)	20 (23)	25 (27.5)	
10				4×5	6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7	
15				4×5	6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7	
22				4×5	6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7	6.3×7	
33				5×5 / 6.3×5.2	6.3×5.2 / 6.3×7	6.3×7	6.3×7	
39				5×5 / 6.3×5.2	6.3×5.2 / 6.3×7	6.3×7	6.3×7	
47				6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7	6.3×7		
68				6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7			
82				6.3×5.2 / 6.3×7	6.3×7			
100	4×5 / 5×5	5×5	6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7	6.3×7			
150	5×5 / 6.3×5.2	6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7	6.3×7				
180	5×5 / 6.3×5.2	6.3×5.2 / 6.3×7	6.3×7	6.3×7				
220	5×5 / 6.3×5.2	6.3×5.2 / 6.3×7	6.3×7	6.3×7				
270	6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7	6.3×7					
330	6.3×5.2 / 6.3×7	6.3×5.2 / 6.3×7	6.3×7					
390	6.3×7	6.3×7						
470	6.3×7	6.3×7						
560	6.3×7							

✧ Characteristics List

W.V. (V)	Capacitance (μ F)	L.C. (μ A,2min)	tg δ (120Hz,20°C)	ESR (m Ω ,100kHz)	Maximum Permissible Ripple Current(mA,r.m.s)	Size Φ D \times L(mm)
2.5	100	300	0.08	30	1670	4 \times 5
	100	300	0.08	30	1970	5 \times 5
	150	300	0.08	30	1970	5 \times 5
	150	300	0.08	30	2200	6.3 \times 5.2
	180	300	0.08	30	1970	5 \times 5
	180	300	0.08	30	2200	6.3 \times 5.2
	220	300	0.08	30	2200	5 \times 5
	220	300	0.08	30	2610	6.3 \times 5.2
	270	300	0.08	25	2610	6.3 \times 5.2
	270	300	0.08	20	2690	6.3 \times 7
	330	300	0.08	25	2610	6.3 \times 5.2
	330	300	0.08	20	2690	6.3 \times 7
	390	300	0.08	20	2690	6.3 \times 7
	470	300	0.08	15	3100	6.3 \times 7
560	300	0.08	15	3100	6.3 \times 7	
4.0	100	300	0.08	30	1970	5 \times 5
	150	300	0.08	30	2200	6.3 \times 5.2
	150	300	0.08	25	2670	6.3 \times 7
	180	300	0.08	30	2200	6.3 \times 5.2
	180	300	0.08	25	2670	6.3 \times 7
	220	300	0.08	25	2610	6.3 \times 5
	220	300	0.08	20	2690	6.3 \times 7
	270	300	0.08	25	2610	6.3 \times 5.2
	270	300	0.08	20	2690	6.3 \times 7
	330	300	0.08	20	2690	6.3 \times 5.2
	330	300	0.08	15	3100	6.3 \times 7
	390	300	0.08	15	3100	6.3 \times 7
	470	300	0.08	15	3100	6.3 \times 7
	6.3	100	300	0.08	25	2390
100		300	0.08	20	2690	6.3 \times 7
150		300	0.08	25	2390	6.3 \times 5.2
150		300	0.08	20	2690	6.3 \times 7
180		300	0.08	20	2690	6.3 \times 7
220		300	0.08	15	3100	6.3 \times 7
270		300	0.08	15	3100	6.3 \times 7
330		300	0.08	15	3100	6.3 \times 7
10	10	300	0.08	45	1200	4 \times 5
	15	300	0.08	45	1200	4 \times 5
	22	300	0.08	45	1200	4 \times 5
	33	300	0.08	45	1670	5 \times 5
	33	300	0.08	30	2200	6.3 \times 5.2
	39	300	0.08	45	1670	5 \times 5
	39	300	0.08	30	2200	6.3 \times 5.2
	47	300	0.08	30	2200	6.3 \times 5.2
	47	300	0.08	20	2690	6.3 \times 7
	68	300	0.08	30	2200	6.3 \times 5.2
	68	300	0.08	20	2690	6.3 \times 7
	82	300	0.08	30	2200	6.3 \times 5.2
	82	300	0.08	20	2690	6.3 \times 7
	100	300	0.08	30	2200	6.3 \times 5.2
100	300	0.08	20	2690	6.3 \times 7	
150	300	0.08	20	2690	6.3 \times 7	

W.V. (V)	Capacitance (μ F)	L.C. (μ A, 2min)	tg δ (120Hz, 20°C)	ESR (m Ω , 100kHz)	Maximum Permissible Ripple Current(mA, r.m.s)	Size Φ D \times L(mm)
10	180	300	0.08	20	2690	6.3 \times 7
	220	300	0.08	20	2690	6.3 \times 7
16	10	300	0.08	30	2200	6.3 \times 5.2
	10	300	0.08	25	2610	6.3 \times 7
	15	300	0.08	30	2200	6.3 \times 5.2
	15	300	0.08	25	2610	6.3 \times 7
	22	300	0.08	30	2200	6.3 \times 5.2
	22	300	0.08	25	2610	6.3 \times 7
	33	300	0.08	30	2200	6.3 \times 5.2
	33	300	0.08	25	2610	6.3 \times 7
	47	300	0.08	30	2200	6.3 \times 5.2
	47	300	0.08	25	2610	6.3 \times 7
	68	300	0.08	30	2200	6.3 \times 5.2
	68	300	0.08	20	2690	6.3 \times 7
	82	300	0.08	20	2690	6.3 \times 7
	100	300	0.08	20	2690	6.3 \times 7
20	10	300	0.08	30	2200	6.3 \times 5.2
	10	300	0.08	25	2670	6.3 \times 7
	15	300	0.08	30	2200	6.3 \times 5.2
	15	300	0.08	25	2670	6.3 \times 7
	22	300	0.08	30	2200	6.3 \times 5.2
	22	300	0.08	25	2670	6.3 \times 7
	33	300	0.08	25	2670	6.3 \times 7
	39	300	0.08	25	2670	6.3 \times 7
	47	300	0.08	25	2670	6.3 \times 7
25	10	300	0.08	30	2200	6.3 \times 5.2
	10	300	0.08	25	2670	6.3 \times 7
	22	300	0.08	25	2670	6.3 \times 7
	33	300	0.08	25	2670	6.3 \times 7
	39	300	0.08	25	2670	6.3 \times 7

◇ Frequency Coefficient for Ripple Current

Frequency	120Hz \leq freq.<1KHz	1KHz \leq freq.<10KHz	10KHz \leq freq.<100KHz	100KHz \leq freq.<300KHz
Coefficient	0.05	0.3	0.7	1

PE series

◇ Features

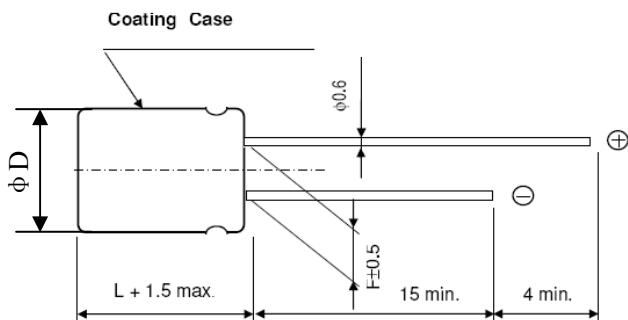
- Down Size to $\phi 6.3 \times 8$.
- Low ESR & large capacitance.
- Large permissible ripple current.



◇ Specifications

Items	Characteristics	
Operating Temp. Range	-55°C ~ +105°C	
Capacitance Range	180 ~ 3500 μ F	
Capacitance Tolerance	M: $\pm 20\%$	
Rated Voltage Range	2.5V ~ 16V DC	
Dissipation Factor (at 120Hz, 20°C)	Not to exceed the value specified	
Leakage Current	$\leq 0.2CV$ (μ A, after 2 minutes)	
ESR (100K~300KHz)	Not to exceed the value specified	
Endurance 105°C, 2000h, at rated voltage	Capacitance	Within $\pm 20\%$ of the value before test
	Leakage current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified
Moisture Resistance Stored at 60°C, RH90~ 95%, 2000h	Capacitance	Within $\pm 20\%$ of the value before test
	Leakage Current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified

◇ Dimensions



Unit: mm

$\phi D \times L$	$\phi D + 0.5 \text{ max.}$	α	F	$\phi d \pm 0.05$
6.3 × 8	6.3	1.5	2.5	0.6

◇ Characteristics List

W.V. (V)	Capacitance (μ F)	L.C. (μ A, 2min)	$\text{tg } \delta$ (120Hz, 20°C)	ESR ($m\Omega$, 100kHz)	Maximum Permissible Ripple Current(mA, r.m.s)	Size $\phi D \times L$ (mm)
2.5	820	410	0.08	7	5000	6.3 × 8
4.0	560	448	0.08	7	5000	
6.3	470	592.2	0.08	8	4700	
	560	705.6	0.08	8	4700	

◇ Frequency Coefficient for Ripple Current

Frequency	120Hz \leq freq. < 1KHz	1KHz \leq freq. < 10KHz	10KHz \leq freq. < 100KHz	100KHz \leq freq. < 300KHz
Coefficient	0.05	0.3	0.7	1

PM series

SMD type & Low Profile



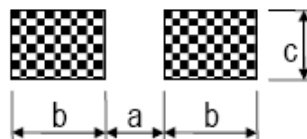
Features

- SMD type & Low profile
- Low ESR at high frequency range & Large permissible ripple current.
- Long life and high reliability(reliability: 0.1%/1000Hrs).

Specifications

Items	Characteristics	
Operating Temp. Range	-55°C~+105°C	
Capacitance Range	10~560 μ F	
Capacitance Tolerance	M: ±20%	
Rated Voltage Range	2.5V ~25V DC	
Dissipation Factor (at 120Hz,20°C)	Not to exceed the value specified	
Leakage Current	Not to exceed the value specified (μ A, after 2 minutes)	
ESR (100K~300KHz)	Not to exceed the value specified	
Endurance 105°C, 2000h, at rated voltage	Capacitance	Within ±20% of the value before test
	Leakage current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified
Moisture Resistance Stored at 60°C, RH90~ 95%, 2000h	Capacitance	Within ±20% of the value before test
	Leakage Current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified

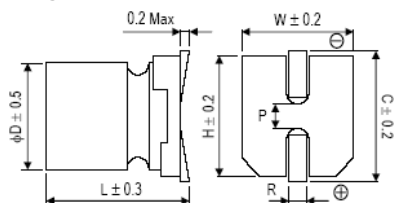
Recommended land pattern



(unit: mm)

φ D×L	a	b	c
4×5.5	1.0	2.6	1.6
5×5.5	1.4	3.0	1.6
6.3×5.8	2.1	3.5	1.6
6.3×7.7	2.1	3.5	1.6

Diagram of Dimensions



(unit: mm)

φ D×L	W	H	C	R	P
4×5.5	4.3	4.3	5.1	0.5 to 0.8	1.0
5×5.5	5.3	5.3	5.9	0.5 to 0.8	1.4
6.3×5.8	6.5	6.5	7.2	0.5 to 0.8	2.1
6.3×7.7	6.5	6.5	7.2	0.5 to 0.8	2.1

Size List

CAP	RV (SV)						
	2.5 (2.8)	4 (4.6)	6.3 (7.2)	10 (11.5)	16 (18.4)	20 (23)	25 (27.5)
10				4×5.5	6.3×5.8/ 6.3×7.7	6.3×5.8/ 6.3×7.7	6.3×5.8/ 6.3×7.7
15				4×5.5	6.3×5.8/ 6.3×7.7	6.3×5.8/ 6.3×7.7	6.3×5.8/ 6.3×7.7
22				4×5.5	6.3×5.8/ 6.3×7.7	6.3×5.8/ 6.3×7.7	6.3×7.7
33				5×5.5/6.3×5.8	6.3×5.8/ 6.3×7.7	6.3×7.7	6.3×7.7
39				5×5.5 /6.3×5.8	6.3×5.8/ 6.3×7.7	6.3×7.7	6.3×7.7
47				6.3×5.8/ 6.3×7.7	6.3×5.8/ 6.3×7.7	6.3×7.7	
68				6.3×5.8/ 6.3×7.7	6.3×5.8/ 6.3×7.7		
82				6.3×5.8/ 6.3×7.7	6.3×7.7		
100	4×5.5 /5×5.5	5×5.5	6.3×5.8/6.3×7.7	6.3×5.8/ 6.3×7.7	6.3×7.7		
150	5×5.5 /6.3×5.8	6.3×5.5/6.3×7.7	6.3×5.8/6.3×7.7	6.3×7.7			
180	5×5.5/6.3×5.8	6.3×5.5 / 6.3×7.7	6.3×7.7	6.3×7.7			
220	5×5.5/6.3×5.8	6.3×5.5/6.3×7.7	6.3×7.7	6.3×7.7			
270	6.3×5.8/6.3×7.7	6.3×5.5 / 6.3×7.7	6.3×7.7				
330	6.3×5.8 / 6.3×7.7	6.3×5.5/6.3×7.7	6.3×7.7				
390	6.3×7.7	6.3×7.7					
470	6.3×7.7	6.3×7.7					
560	6.3×7.7						

✧ Characteristics List

W.V. (V)	Capacitance (μ F)	L.C. (μ A,2min)	tg δ (120Hz,20°C)	ESR (m Ω ,100kHz)	Maximum Permissible Ripple Current(mA,r.m.s)	Size Φ D \times L(mm)	
2.5	100	300	0.08	30	1670	4 \times 5.5	
	100	300	0.08	30	1970	5 \times 5.5	
	150	300	0.08	30	1970	5 \times 5.5	
	150	300	0.08	30	2200	6.3 \times 5.8	
	180	300	0.08	30	1970	5 \times 5.5	
	180	300	0.08	30	2200	6.3 \times 5.8	
	220	300	0.08	30	2200	5 \times 5.5	
	220	300	0.08	30	2610	6.3 \times 5.8	
	270	300	0.08	25	2610	6.3 \times 5.8	
	270	300	0.08	20	2690	6.3 \times 7.7	
	330	300	0.08	25	2610	6.3 \times 5.8	
	330	300	0.08	20	2690	6.3 \times 7.7	
	390	300	0.08	20	2690	6.3 \times 7.7	
	470	300	0.08	15	3100	6.3 \times 7.7	
	560	300	0.08	15	3100	6.3 \times 7.7	
4.0	100	300	0.08	30	1970	5 \times 5.5	
	150	300	0.08	30	2200	6.3 \times 5.8	
	150	300	0.08	25	2670	6.3 \times 7.7	
	180	300	0.08	30	2200	6.3 \times 5.8	
	180	300	0.08	25	2670	6.3 \times 7.7	
	220	300	0.08	25	2610	6.3 \times 5.8	
	220	300	0.08	20	2690	6.3 \times 7.7	
	270	300	0.08	25	2610	6.3 \times 5.8	
	270	300	0.08	20	2690	6.3 \times 7.7	
	330	300	0.08	20	2690	6.3 \times 5.8	
	330	300	0.08	15	3100	6.3 \times 7.7	
	390	300	0.08	15	3100	6.3 \times 7.7	
	470	300	0.08	15	3100	6.3 \times 7.7	
	6.3	100	300	0.08	25	2390	6.3 \times 5.8
		100	300	0.08	20	2690	6.3 \times 7.7
150		300	0.08	25	2390	6.3 \times 5.8	
150		300	0.08	20	2690	6.3 \times 7.7	
180		300	0.08	20	2690	6.3 \times 7.7	
220		300	0.08	15	3100	6.3 \times 7.7	
270		300	0.08	15	3100	6.3 \times 7.7	
330		300	0.08	15	3100	6.3 \times 7.7	
10		10	300	0.08	45	1200	4 \times 5.5
	15	300	0.08	45	1200	4 \times 5.5	
	22	300	0.08	45	1200	4 \times 5.5	
	33	300	0.08	45	1670	5 \times 5.5	
	33	300	0.08	30	2200	6.3 \times 5.8	
	39	300	0.08	45	1670	5 \times 5.5	
	39	300	0.08	30	2200	6.3 \times 5.8	
	47	300	0.08	30	2200	6.3 \times 5.8	
	47	300	0.08	20	2690	6.3 \times 7.7	
	68	300	0.08	30	2200	6.3 \times 5.8	
	68	300	0.08	20	2690	6.3 \times 7.7	
	82	300	0.08	30	2200	6.3 \times 5.8	
	82	300	0.08	20	2690	6.3 \times 7.7	

W.V. (V)	Capacitance (μ F)	L.C. (μ A, 2min)	tg δ (120Hz, 20°C)	ESR (m Ω , 100kHz)	Maximum Permissible Ripple Current(mA, r.m.s)	Size Φ D \times L(mm)
10	100	300	0.08	30	2200	6.3 \times 5.8
	100	300	0.08	20	2690	6.3 \times 7.7
	150	300	0.08	20	2690	6.3 \times 7.7
	180	300	0.08	20	2690	6.3 \times 7.7
	220	300	0.08	20	2690	6.3 \times 7.7
16	10	400	0.08	30	2200	6.3 \times 5.8
	10	400	0.08	25	2610	6.3 \times 7.7
	15	400	0.08	30	2200	6.3 \times 5.8
	15	400	0.08	25	2610	6.3 \times 7.7
	22	400	0.08	30	2200	6.3 \times 5.8
	22	400	0.08	25	2610	6.3 \times 7.7
	33	400	0.08	30	2200	6.3 \times 5.8
	33	400	0.08	25	2610	6.3 \times 7.7
	47	400	0.08	30	2200	6.3 \times 5.8
	47	400	0.08	25	2610	6.3 \times 7.7
	68	400	0.08	30	2200	6.3 \times 5.8
	68	400	0.08	20	2690	6.3 \times 7.7
	82	400	0.08	20	2690	6.3 \times 7.7
	100	400	0.08	20	2690	6.3 \times 7.7
20	10	600	0.08	30	2200	6.3 \times 5.8
	10	600	0.08	25	2670	6.3 \times 7.7
	15	600	0.08	30	2200	6.3 \times 5.8
	15	600	0.08	25	2670	6.3 \times 7.7
	22	600	0.08	30	2200	6.3 \times 5.8
	22	600	0.08	25	2670	6.3 \times 7.7
	33	600	0.08	25	2670	6.3 \times 7.7
	39	600	0.08	25	2670	6.3 \times 7.7
	47	600	0.08	25	2670	6.3 \times 7.7
25	10	600	0.08	30	2200	6.3 \times 5.8
	10	600	0.08	25	2670	6.3 \times 7.7
	22	600	0.08	25	2670	6.3 \times 7.7
	33	600	0.08	25	2670	6.3 \times 7.7
	39	600	0.08	25	2670	6.3 \times 7.7

◇ Frequency Coefficient for Ripple Current

Frequency	120Hz \leq freq.<1KHz	1KHz \leq freq.<10KHz	10KHz \leq freq.<100KHz	100KHz \leq freq.<300KHz
Coefficient	0.05	0.3	0.7	1

PD series

SMD type & Large capacitance



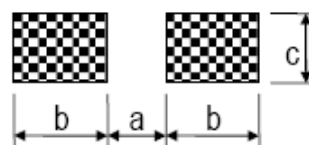
Features

- SMD type & Large capacitance
- Ultra low ESR at high frequency range & Large permissible ripple current.
- Long life and high reliability(reliability: 0.1%/1000Hrs).

Specifications

Items	Characteristics	
Operating Temp. Range	-55°C ~ +105°C	
Capacitance Range	39 ~ 3300 μF	
Capacitance Tolerance	M: ±20%	
Rated Voltage Range	2.5V ~ 25V DC	
Dissipation Factor (at 120Hz, 20°C)	Not to exceed the value specified	
Leakage Current	Not to exceed the value specified (μA, after 2 minutes)	
ESR (100K~300KHz)	Not to exceed the value specified	
Endurance 105°C, 2000h, at rated voltage	Capacitance	Within ±20% of the value before test
	Leakage current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified
Moisture Resistance Stored at 60°C, RH90~ 95%, 2000h	Capacitance	Within ±20% of the value before test
	Leakage Current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified

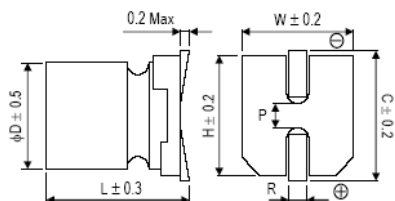
Recommended land pattern



(unit: mm)

φD×L	a	b	c
8×11.7	2.8	4.2	1.9
10×12.4	4.3	4.4	1.9

Diagram of Dimensions



(unit: mm)

φD×L	W	H	C	R	P
8×11.7	8.3	8.3	9.0	0.8 to 1.1	3.2
10×12.4	10.3	10.3	11.0	0.8 to 1.1	4.6

Size List

CAP	RV (SV)						
	2.5 (2.8)	4 (4.6)	6.3 (7.2)	10 (11.5)	16 (18.4)	20 (23)	25 (27.5)
39						8×11.7	8×11.7
47						8×11.7	8×11.7
68						8×11.7	8×11.7
82						8×11.7	8×11.7
100						10×12.4	10×12.4
180			8×11.7	8×11.7	8×11.7	10×12.4	10×12.4
220			8×11.7	8×11.7	8×11.7	10×12.4	
270			8×11.7	8×11.7	8×11.7		
330			8×11.7	8×11.7	8×11.7 / 10×12.4		
390			8×11.7	8×11.7	10×12.4		
470			8×11.7	8×11.7	10×12.4		
560	8×11.7	8×11.7	8×11.7	8×11.7	10×12.4		
680	8×11.7	8×11.7	8×11.7/10×12.4	10×12.5	10×12.4		

CAP \ RV (SV)	2.5 (2.8)	4 (4.6)	6.3 (7.2)	10 (11.5)	16 (18.4)	20 (23)	25 (27.5)
820	8×11.7	8×11.7	8×11.7 / 10×12.4	10×12.4	10×12.4		
1000	8×11.7	8×11.7	10×12.4	10×12.4			
1200	8×11.7	8×11.7	10×12.4	10×12.4			
1500	8×11.7	10×12.4	10×12.4				
2000	10×12.4	10×12.4	10×12.4				
2500	10×12.4	10×12.4					
2700	10×12.4						
3000	10×12.4						
3300	10×12.4						

◇ Characteristics List

W.V. (V)	Capacitance (μ F)	L.C. (μ A, 2min)	tg δ (120Hz, 20°C)	ESR (m Ω , 100kHz)	Maximum Permissible Ripple Current(mA, r.m.s)	Size Φ D×L(mm)
2.5	560	280	0.08	8	5200	8×11.7
	680	340	0.08	8	5200	8×11.7
	820	410	0.08	8	5200	8×11.7
	1000	500	0.08	8	5200	8×11.7
	1500	750	0.08	8	5200	8×11.7
	2000	1000	0.08	8	5500	10×12.4
	2500	1250	0.08	8	5500	10×12.4
	2700	1350	0.10	8	5500	10×12.4
	3000	1500	0.10	8	5500	10×12.4
	3300	1650	0.10	8	5500	10×12.4
4.0	560	448	0.08	8	5200	8×11.7
	680	544	0.08	8	5200	8×11.7
	820	656	0.08	8	5200	8×11.7
	1000	800	0.10	8	5200	8×11.7
	1200	960	0.10	8	5200	8×11.7
	1500	1200	0.10	8	5500	10×12.4
	2000	1600	0.10	8	5500	10×12.4
	2500	2000	0.10	8	5500	10×12.4
6.3	180	226.8	0.08	8	5200	8×11.7
	220	277.2	0.08	8	5200	8×11.7
	270	340.2	0.08	8	5200	8×11.7
	330	416	0.08	8	5200	8×11.7
	390	491	0.08	8	5200	8×11.7
	470	592	0.08	8	5200	8×11.7
	560	705.6	0.08	8	5200	8×11.7
	680	856	0.08	8	5200	8×11.7
	680	856	0.08	8	5500	10×12.4
	820	1033.2	0.10	8	5200	8×11.7
	820	1033.2	0.10	8	5500	10×12.4
	1000	1260	0.10	8	5500	10×12.4
	1200	1512	0.10	8	5500	10×12.4
	1500	1890	0.10	8	5500	10×12.4
	2000	2520	0.10	8	5500	10×12.4

W.V. (V)	Capacitance (μ F)	L.C. (μ A,2min)	$\text{tg } \delta$ (120Hz,20°C)	ESR (m Ω ,100kHz)	Maximum Permissible Ripple Current(mA,r.m.s)	Size Φ D \times L(mm)
10	180	360	0.08	8	5200	8 \times 11.7
	220	440	0.08	8	5200	8 \times 11.7
	270	540	0.08	8	5200	8 \times 11.7
	330	660	0.08	8	5200	8 \times 11.7
	390	780	0.08	8	5200	8 \times 11.7
	470	940	0.08	8	5200	8 \times 11.7
	10	560	1120	0.08	8	5200
680		1360	0.10	8	5500	10 \times 12.4
820		1640	0.10	8	5500	10 \times 12.4
1000		2000	0.10	8	5500	10 \times 12.4
1200		2400	0.10	8	5500	10 \times 12.4
16	180	576	0.08	10	4700	8 \times 11.7
	220	704	0.08	10	4700	8 \times 11.7
	270	864	0.08	10	4700	8 \times 11.7
	330	1056	0.08	10	4700	8 \times 11.7
	330	1056	0.08	10	5100	10 \times 12.4
	470	1504	0.10	10	5100	10 \times 12.4
	680	2176	0.10	10	5100	10 \times 12.4
	820	2624	0.10	10	5100	10 \times 12.4
20	39	156	0.08	15	4210	8 \times 11.7
	47	188	0.08	15	4210	8 \times 11.7
	68	272	0.08	15	4210	8 \times 11.7
	82	328	0.08	15	4210	8 \times 11.7
	100	400	0.08	15	4800	10 \times 12.4
	180	720	0.10	15	4800	10 \times 12.4
	220	880	0.10	15	4800	10 \times 12.4
25	39	195	0.08	15	4210	8 \times 11.7
	47	235	0.08	15	4210	8 \times 11.7
	68	340	0.08	15	4210	8 \times 11.7
	82	410	0.08	15	4210	8 \times 11.7
	100	500	0.10	15	4800	10 \times 12.4
	150	750	0.10	15	4800	10 \times 12.4
	180	900	0.10	15	4800	10 \times 12.4

◇ Frequency Coefficient for Ripple Current

Frequency	120Hz \leq freq.<1KHz	1KHz \leq freq.<10KHz	10KHz \leq freq.<100KHz	100KHz \leq freq.<300KHz
Coefficient	0.05	0.3	0.7	1

PV series

SMD type & Low height

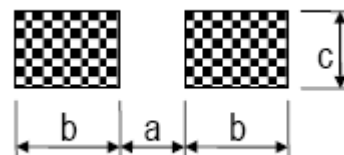
Features

- SMD type , Low height & Large capacitance
- low ESR at high frequency range & .Large permissible ripple current.
- Long life and high reliability(reliability: 0.1%/1000Hrs).



Specifications

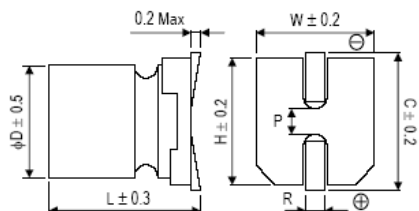
Items	Characteristics	
Operating Temp. Range	-55°C~+105°C	
Capacitance Range	22~3300 μ F	
Capacitance Tolerance	M: ±20%	
Rated Voltage Range	2.5V ~25V DC	
Dissipation Factor (at 120Hz,20°C)	Not to exceed the value specified	
Leakage Current	Not to exceed the value specified (μ A, after 2 minutes)	
ESR (100K~300KHz)	Not to exceed the value specified	
Endurance 105°C , 2000h, at rated voltage	Capacitance	Within ±20% of the value before test
	Leakage current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified
	Moisture Resistance Stored at 60°C , RH90~ 95% , 2000h	Capacitance
	Leakage Current	Not to exceed the value specified
	ESR	Not to exceed 150% of the value specified
	Dissipation Factor	Not to exceed 150% of the value specified



(unit: mm)

φ D×L	a	b	c
8×7.7	2.8	4.2	1.9
8×10.5	2.8	4.2	1.9
10×7.7	4.3	4.4	1.9
10×10.5	4.3	4.4	1.9

Diagram of Dimensions



(unit: mm)

φ D×L	W	H	C	R	P
8×7.7	8.3	8.3	9.0	0.8 to 1.1	3.2
8×10.5	8.3	8.3	9.0	0.8 to 1.1	3.2
10×7.7	10.3	10.3	11.0	0.8 to 1.1	4.6
10×10.5	10.3	10.3	11.0	0.8 to 1.1	4.6

Size List

(SV) CAP	RV	2.5 (2.8)	4 (4.6)	6.3 (7.2)	10 (11.5)	16 (18.4)	20 (23)	25 (27.5)
	39							8×7.7/8×10.5
47							8×7.7/8×10.5	8×7.7/8×10.5
68							8×7.7/8×10.5	8×7.7/8×10.5
82							8×7.7/8×10.5	8×7.7/8×10.5
100							8×7.7/8×10.5	8×10.5/10×7.7
150							8×10.5/10×7.7	10×10.5
180			8×7.7	8×7.7	8×7.7/8×10.5	10×7.7/10×10.5		
220			8×7.7	8×7.7	8×7.7/8×10.5	10×10.5		
270			8×7.7	8×7.7	8×10.5/10×7.7			
330			8×7.7/8×10.5	8×7.7	8×10.5/10×7.7			
390			8×7.7/8×10.5	8×7.7	10×10.5			
470			8×7.7/8×10.5	8×10.5	10×10.5			
560	8×7.7	8×7.7/8×10.5	8×7.7/8×10.5	10×7.7				
680	8×7.7	8×7.7/8×10.5	8×10.5/10×7.7	10×7.7				

RV (SV) CAP	2.5 (2.8)	4 (4.6)	6.3 (7.2)	10 (11.5)	16 (18.4)	20 (23)	25 (27.5)
820	8×7.7	8×7.7/8×10.5	10×7.7/10×10.5	10×10.5			
1000	8×7.7	8×10.5	10×7.7/10×10.5				
1200	8×10.5	10×7.7/10×10.5	10×10.5				
1500	10×7.7	10×7.7/10×10.5					
2000	10×7.7	10×10.5					
2500	10×10.5						

✧ Characteristics List

W.V. (V)	Capacitance (μ F)	L.C. (μ A,2min)	$\text{tg } \delta$ (120Hz,20°C)	ESR (m Ω ,100kHz)	Maximum Permissible Ripple Current(mA,r.m.s)	Size Φ D×L(mm)
2.5	560	280	0.08	15	3700	8×7.7
	680	340	0.08	15	3700	8×7.7
	820	410	0.08	15	3700	8×7.7
	1000	500	0.08	15	3700	8×7.7
	1200	600	0.08	11	4800	8×10.5
	1500	750	0.10	15	4100	10×7.7
	2000	1000	0.10	15	4100	10×7.7
	2500	1250	0.10	11	5100	10×10.5
4.0	560	448	0.08	15	3700	8×7.7
	560	448	0.08	11	4800	8×10.5
	680	544	0.08	15	3700	8×7.7
	680	544	0.08	11	4800	8×10.5
	820	656	0.08	15	3700	8×7.7
	820	656	0.08	11	4800	8×10.5
	1000	800	0.10	11	4800	8×10.5
	1200	960	0.10	15	4100	10×7.7
	1200	960	0.10	11	5100	10×10.5
	1500	1200	0.10	15	4100	10×7.7
	1500	1200	0.10	11	5100	10×10.5
	2000	1600	0.10	11	5100	10×10.5
6.3	180	227	0.08	15	3700	8×7.7
	220	277	0.08	15	3700	8×7.7
	270	340	0.08	15	3700	8×7.7
	330	416	0.08	15	3700	8×7.7
	330	416	0.08	11	4800	8×10.5
	390	491	0.08	15	3700	8×7.7
	390	491	0.08	11	4800	8×10.5
	470	592	0.08	15	3700	8×7.7
	470	592	0.08	11	4800	8×10.5
	560	705.6	0.08	15	3700	8×7.7
	560	705.6	0.08	11	4800	8×10.5
	6.3	680	856.8	0.08	11	4800
680		856.8	0.08	15	4100	10×7.7
820		1033.2	0.10	15	4100	10×7.7
820		1033.2	0.10	11	5100	10×10.5
1000		1260	0.10	15	4100	10×7.7
1000		1260	0.10	11	5100	10×10.5
1200		1260	0.10	11	5100	10×10.5

W.V. (V)	Capacitance (μ F)	L.C. (μ A,2min)	$\text{tg } \delta$ (120Hz,20°C)	ESR (m Ω ,100kHz)	Maximum Permissible Ripple Current(mA,r.m.s)	Size Φ D \times L(mm)	
10	180	360	0.08	15	3700	8 \times 7.7	
	220	440	0.08	15	3700	8 \times 7.7	
	330	660	0.08	15	3700	8 \times 7.7	
	390	780	0.08	15	3700	8 \times 7.7	
	470	940	0.08	11	4800	8 \times 10.5	
	560	1120	0.08	15	4100	10 \times 7.7	
	680	1360	0.10	15	4100	10 \times 7.7	
	820	1640	0.10	11	5100	10 \times 10.5	
16	180	288	0.08	15	3700	8 \times 7.7	
	180	288	0.08	11	4800	8 \times 10.5	
	220	352	0.08	15	3700	8 \times 7.7	
	220	352	0.08	11	4800	8 \times 10.5	
	270	432	0.08	11	4800	8 \times 10.5	
	270	432	0.08	15	4100	10 \times 7.7	
	330	528	0.08	11	4800	8 \times 10.5	
	330	528	0.08	15	4100	10 \times 7.7	
	390	624	0.10	11	5100	10 \times 10.5	
	470	752	0.10	11	5100	10 \times 10.5	
	20	39	156	0.08	18	3500	8 \times 7.7
		39	156	0.08	12	4500	8 \times 10.5
47		188	0.08	18	3500	8 \times 7.7	
47		188	0.08	12	4500	8 \times 10.5	
68		272	0.08	18	3500	8 \times 7.7	
68		272	0.08	12	4500	8 \times 10.5	
82		328	0.08	18	3500	8 \times 7.7	
82		328	0.08	12	4500	8 \times 10.5	
100		400	0.08	18	3500	8 \times 7.7	
100		400	0.08	12	4500	8 \times 10.5	
150		600	0.08	12	4500	8 \times 10.5	
150		600	0.08	15	4100	10 \times 7.7	
180		720	0.10	15	4100	10 \times 7.7	
180		720	0.10	11	5100	10 \times 10.5	
220		880	0.10	11	5100	10 \times 10.5	
25		39	195	0.08	18	3500	8 \times 7.7
	39	195	0.08	12	4500	8 \times 10.5	
	47	235	0.08	18	3500	8 \times 7.7	
	47	235	0.08	12	4500	8 \times 10.5	
	68	340	0.08	18	3500	8 \times 7.7	
	68	340	0.08	12	4500	8 \times 10.5	
	82	410	0.08	18	3500	8 \times 7.7	
	82	410	0.08	12	4500	8 \times 10.5	
	100	500	0.10	12	4500	8 \times 10.5	
	100	500	0.10	15	4100	10 \times 7.7	
	150	750	0.10	12	5000	10 \times 10.5	

✧ Frequency Coefficient for Ripple Current

Frequency	120Hz \leq freq.<1KHz	1KHz \leq freq.<10KHz	10KHz \leq freq.<100KHz	100KHz \leq freq.<300KHz
Coefficient	0.05	0.3	0.7	1

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